ANSI/ASA S12.60-2010/Part 1
(Revision of ANSI/ASA S12.60-2002)
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AMERICAN NATIONAL STANDARD

Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools

ANSI/ASA S12.60-2010/Part 1

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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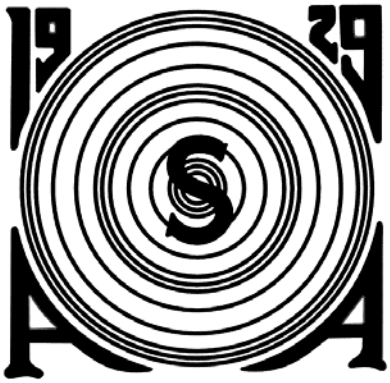

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Secretariat:

Acoustical Society of America

Approved April 28, 2010 by:

American National Standards Institute, Inc.

Abstract

This document is Part 1 of the ANSI/ASA S12.60 series and is applicable to classrooms and other learning spaces in permanent schools. Part 2 of the ANSI/ASA S12.60 series is applicable to relocatable classrooms and relocatable modular core learning spaces. This standard includes acoustical performance criteria, and design requirements for classrooms and other learning spaces. Annex A provides procedures for optional testing to determine conformance with the source background noise requirements and the noise isolation requirements of this standard. Annex B provides commentary information on various paragraphs of this standard. Annex C provides guidelines for controlling reverberation in classrooms.

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Acoustical Society of America
ASA 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

Contents

Tables

Foreword

[*This Foreword is for information only and is not a part of the American National Standard ANSI/ASA S12.60-2010/Part 1 American National Standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools.*]

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.*

At the time of publication of this document, the ANSI/ASA S12.60 series of standards includes the following American National Standards:

- ANSI/ASA S12.60-2010/Part 1 *American National Standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools*
- ANSI/ASA S12.60-2009/Part 2 *American National Standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 2: Relocatable Classroom Factors.*

Work is also underway on a new part, ANSI/ASA S12.60/Part 3, *American National Standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 3: Information Technology Equipment in Classrooms.* An informative technical report is also planned as Part 4 of this series which is envisioned to cover, at a minimum, the topics previously included in ANSI/ASA S12.60-2002 (R 2009), Annexes A, B, D, F and G.

This standard is not comparable to any existing ISO Standard.

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

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R.D. Hellweg, *Vice-Chair*

S.B. Blaeser, *Secretary*

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NASA Glenn Research Center ..... B. Cooper

National Council of Acoustical Consultants ..... J. Erdreich
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Noise Control Engineering, Inc. ..... M. Bahtiarian
..... R. Fischer (Alt.)

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North American Insulation Manufacturers Association ..... H. Alter

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U.S. Army Center for Health Promotion and Preventive Medicine ..... W.D. Whiteford
..... C. Stewart (Alt.)

U.S. Army Construction Engineering Research Laboratory ..... M.J. White
..... M. Swearington (Alt.)

U.S. Army Research Laboratory ..... M.S. Binseel

U.S. Department of Transportation ..... A. Konheim

U.S. Naval Surface Warfare Center - Carderock ..... M. Craun

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

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

Working Group S12/WG 52, Revision of ANSI S12.60-2002, which assisted Accredited Standards Committee S12, Noise, in the development of this standard, had the following membership:

S. Lind, Co-Chair
P.D. Schomer, Co-Chair

D. Abbate
B.J. Bice
J.S. Bradley
B.M. Brooks
A.J. Campanella
R.C. Coffeen
D.A. Collings
D.S. Collins
I. Derks
G. Ehrlich
S.L. Ehrlich
J. Erdreich
J.M. Flanders
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R.D. Hellweg, Jr.
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C. Johnson
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J.J. Smaldino
S.D. Soli
D.L. Sorkin
N. Stewart
L.C. Sutherland
L. Thibault
R. Wowk

Suggestions for improvements to 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.

Introduction

It is essential that both architectural and mechanical design provide good acoustical characteristics for classrooms and other learning spaces in which speech communication is an important part of the learning process. Excessive background noise or reverberation in such spaces interferes with speech communication and thus presents an acoustical impediment to learning. With a classroom having good acoustical characteristics, learning is easier, deeper, more sustained, and less fatiguing. Teaching should be more effective and less stressful with well designed acoustical characteristics in a classroom. There can be more verbal interaction and less repetition between teacher and students when spoken words are clearly heard and understood. All those in a classroom, including teachers and adult learners, will benefit from a classroom having the acoustical characteristics recommended in this standard. Special beneficiaries are young children and persons with hearing, language, speech, attention deficit, or learning disabilities. Conformance to the requirements and guidelines of this standard will improve the quality of education by eliminating acoustical impediments for all students and teachers, including those with communication disabilities. This standard seeks to provide flexibility for the design of learning spaces without compromising the goal of obtaining adequate speech intelligibility for all students and teachers in classrooms and learning spaces within the scope of this standard.

American National Standard

Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools, Part 1: Permanent Schools

1 Scope and purpose

1.1 Scope

1.1.1 Part 1 of ANSI/ASA S12.60 is applicable to core learning spaces and classrooms with interior volumes not exceeding 566 m^3 (20 000 ft^3) and to ancillary learning spaces of any volume. Learning spaces with volumes larger than 566 m^3 (20 000 ft^3) are considered ancillary learning spaces for purposes of this standard. Annex A provides testing procedures when optional tests are performed to determine conformance with the source background noise requirements and the noise isolation requirements of this standard. Annex B provides commentary information on various paragraphs of this standard. Annex C provides guidelines for controlling reverberation in classrooms and other learning spaces.

This Part does not apply for natatoria, auditoria, music performance spaces, teleconferencing rooms, or special education rooms such as those for severely acoustically challenged students, which all require special acoustical design and treatment that is not within the scope of this standard. This Part does not apply to relocatable classrooms or relocatable modular learning spaces, which are covered by Part 2 of ANSI/ASA S12.60.

1.1.2 Acoustical performance criteria are specified in this standard by limits on the greatest one-hour average A-weighted and C-weighted background noise levels and by limits on reverberation times when students are expected to be present.

1.1.3 The control of background noise levels in this standard is achieved, in part, by specifying the minimum outdoor-to-indoor transmission class (OITC) ratings and sound transmission class (STC) ratings, depending upon the sound source, to reduce noise that intrudes into the classroom or learning space from sources outside of the building envelope, and specifying minimum STC ratings for walls and floor-ceiling assemblies where noise that originates within the school building intrudes into the classroom through classroom walls and floor/ceiling assemblies. The control of noise from footsteps or other impacts on a floor above is achieved by specifying an impact insulation class (IIC) rating for the floor/ceiling assembly.

1.1.4 This standard applies to siting and building-design-dependent sources of intrusive noise in learning spaces in schools, including noise produced by heating, ventilating, and air-conditioning (HVAC) systems; building services; and exterior sound sources such as vehicular traffic and aircraft overflights. This standard applies to the design and performance of unoccupied spaces and does not apply to sound generated within a classroom by its occupants including voices and the sounds of classroom activities such as the moving of chairs, nor does it apply to the sound from portable or permanent built-in equipment used during the course of instruction, such as computers, as long as the equipment can be turned off in the room.