ANSI S12.2-1995
(ASA 115-1995)

AMERICAN NATIONAL STANDARD

CRITERIA FOR EVALUATING ROOM NOISE

ANSI S12.2-1995 (ASA 115-1995)

Accredited Standards Committee S12, Noise

Standards Secretariat
Acoustical Society of America
120 Wall Street, 32nd Floor
New York, New York 10005-3993

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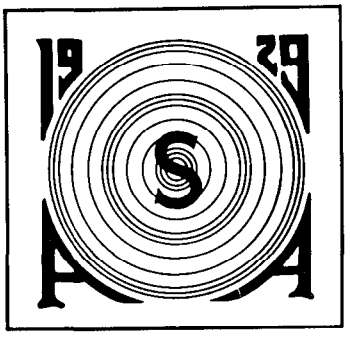

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Secretariat
Acoustical Society of America

Approved 10 July 1995
American National Standards Institute, Inc.

ABSTRACT

This standard defines four different sets of criterion curves and gives rules for using them to evaluate room noise.

AMERICAN NATIONAL STANDARDS ON ACOUSTICS

The Acoustical Society of America 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, and general-interest 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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Foreword

[This Foreword is not part of American National Standard Criteria for Evaluating Room Noise, ANSI S12.2-1995 (ASA Catalog No. 115-1995)]

This Standard was developed under the American National Standards Institute (ANSI) Accredited Standards Committee Procedures under the Secretariat of the Acoustical Society of America. Accredited Standards Committee S12, Noise, under whose jurisdiction this standard was developed, 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.*

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

D. L. Johnson, *Chair*
P. D. Schomer, *Vice Chair*
A. Brenig, *Secretary*

Acoustical Society of America	D L. Johnson, W. J. Galloway (*Alt.*)
Acoustical Systems, Inc.	R. Goodwin, R Seitz (*Alt.*)
Air-Conditioning and Refrigeration Institute (ARI)	S. Wang G. Acton (*Alt.*)
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Computer and Business Equipment Manufacturers Association	R Lotz, W. F. Hanrahan (*Alt.*)
Council for Accreditation in Occupational Hearing Conservation (CAOHC)	W. Monk, R. Glaser (*Alt.*)
Naval Surface Warfare Center	D. J. Vendittis
Fastener Industry Noise Control Research Program	E. H. Toothman, F. Akstens (*Alt*)
U. S. Department of Transportation	A. Konheim

Industrial Safety Equipment Association	A M. Bovi, R Campbell (*1st Alt*), F. E. Wilcher (*2nd Alt*)
Larson–Davis Laboratories	R. Anderson, L Davis (*Alt.*)
National Council of Acoustical Consultants	J Erdreich, R. L Richards (*Alt*)
National Electrical Manufacturers Association (NEMA)	D. Rawlings
National Hearing Conservation Association (NHCA)	J Franks, E. H Berger (*Alt.*)
Power Tool Institute, Inc.	R. Callahan, D Keller (*Alt.*)
U. S. Army Aeromedical Research Laboratory	B Mozo, J. H Patterson (*Alt.*)
U. S. Army Construction Engineering Laboratories (USA-CERL)	P D. Schomer, M. White (*Alt.*)
Human Research and Engineering Directorate of the U. S. Army Research Laboratory	G. R. Price, J. Kalb (*Alt.*)
U. S. Department of the Air Force	R. L. McKinley
U. S. Department of the Army, Walter Reed Army Medical Center Army Audiology Speech Center	R. M. Atack
U. S. Department of the Navy, Navy Environmental Health Center	L. Marshall (*Alt*)

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

P. K. Baade	W. J. Galloway	L. H. Royster
R. G. Bartheld	R. M. Guernsey	W. R. Thornton
R W Benson	R. K. Hillquist	H. E. von Gierke
L. L Beranek	D. L. Johnson	L. A. Wilber
E. H. Berger	W. W. Lang	G. E. Winzer
K. M. Eldred	G. C Maling, Jr.	G. S. K. Wong
R. S. Gales	A. H. Marsh	R. W. Young

Working Group S12/WG18, Criteria for Room Noise, which assisted Accredited Standards Committee S12, Noise, in the development of this standard, had the following membership:

R. J. Peppin, *Chair*

L. L. Beranek	R. M. Guernsey
W. E Blazier	R. K. Herbert
A. J. Campanella	G. E. Winzer
E. A. Cohen	H.-S. Pei

American National Standard

Criteria for Evaluating Room Noise

1 Scope

1.1 This Standard defines four sets of criterion curves for evaluating room noise:

1.1.1 Balanced noise criterion (NCB) curves,

1.1.2 Room criterion (RC) curves,

1.1.3 Criteria for acoustically induced vibrations, and

1.1.4 One-third octave band hearing threshold curve.

1.2 Guidance is given for determining whether a set of octave band sound pressure levels satisfies a specified NCB or RC curve.

1.3 Guidance is given for using the NCB or RC criteria to evaluate a set of octave band sound pressure levels as room noise.

1.4 Guidance is given for using a set of octave band sound pressure levels to determine the likelihood of audible, acoustically induced vibrations.

1.5 Guidance is given for using the one-third octave band hearing threshold curve to evaluate a low-noise situation.

1.6 No guidance is given for the selection of equipment and the methods of measuring noise levels to be evaluated by NCB or RC curves.

2 References

2.1 Normative references

(1) **ANSI S1.1-1994** *American National Standard Acoustical Terminology.*

(2) **ANSI S1.4-1983 (R 1990)** *American National Standard Specification for Sound Level Meters.*

(3) **ANSI S1.6-1984 (R 1990)** *American National Standard Preferred Frequencies, Frequency Levels, and Band Numbers for Acoustical Measurements.*

(4) **ANSI S1.13-1971 (R 1986)** *American National Standard Methods for the Measurement of Sound Pressure Levels.*

(5) **ANSI S1.42-1986 (R 1992)** *American National Standard Design Response of Weighting Networks for Acoustical Measurements.*

(6) **ANSI S3.14-1977 (R 1986)** *American National Standard Rating Noise With Respect to Speech Interference.*

2.2 General references

(7) W. E. Blazier, "Revised noise criteria for application in the acoustical design and rating of HVAC systems, *Noise Control Eng. J.* **16(2)**, 64–73 (1981).

(8) L. L. Beranek, "Criteria for office quieting based on questionnaire rating studies," *J. Acoust. Soc. Am.* **28(5)**, 833–852 (1956).

(9) L. L. Beranek, "Revised criteria for noise in buildings," *Noise Control* **3(1)**, 19–27 (1957).

(10) L. L. Beranek, "Balanced noise criterion (NCB) curves," *J. Acoust. Soc. Am.* **86(2)**, 650–664 (1989).

(11) S. S. Stevens, "Perceived level of noise by Mark VII and Decibels E," *J. Acoust. Soc. Am.* **51**, 575–599 (1972).

(12) E. A. Cohen and L. D. Fielder, "Determining noise criteria for recording environments," *J. Audio Eng. Soc.* **40**, 384–402 (1992).

(13) L. L. Beranek, "Application of NCB noise criterion curves," *Noise Control Eng. J.* **33(2)**, 45–56 (1989).

(14) "Sound and vibration control," Chap. 42, *1991 ASHRAE Handbook, Heating, Ventilating, and Air-Conditioning Applications*, p. 42.5 (1991).

3 Significance and use

3.1 This standard was based on the best data available at the time of writing and may be subject to change. It is assumed that the methods described are appropriate for evaluating environments similar to those where data were collected during the development of those methods. See Appendix A, Ref. 8, Ref. 11, and Ref. 13 for a further discussion of the development of those methods.

3.2 Either balanced noise criterion (NCB) or room criterion (RC) may be specified in order to help con-