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**AMERICAN NATIONAL STANDARD**

# **Measurement of Occupational Noise Exposure**

**Secretariat:**

**Acoustical Society of America**

**Approved on 29 March 1996:**

**American National Standards Institute, Inc.**

## **Abstract**

The standard presents methods that can be used to measure a person's noise exposure received in a work place. The methods have been developed to provide uniform procedures and repeatable results for the measurement of occupational noise exposure.

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# AMERICAN NATIONAL STANDARD **MEASUREMENT OF OCCUPATIONAL NOISE EXPOSURE**

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ANSI S12.19-1996

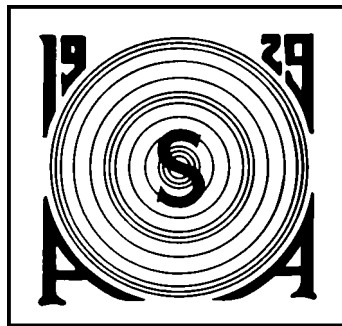
Accredited Standards Committee S12, Noise

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Standards Secretariat  
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**ABSTRACT**

The standard presents methods that can be used to measure a person's noise exposure received in a work place. The methods have been developed to provide uniform procedures and repeatable results for the measurement of occupational noise exposure.

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## Foreword

[This Foreword is not part of ANSI S12.19-1996 American National Standard Method for the Measurement of Occupational Noise Exposure.]

This standard was developed using the American National Standards Institute (ANSI) Accredited Standards Committee Procedure 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 acoustic 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 for approval, the membership was as follows:

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

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R. S. Gales	G. C. Maling, Jr.	R. W. Young

Working Group S12/WG19, Measurement of Occupational Noise Exposure, which assisted Accredited Standards Committee S12, Noise, in the development of this standard, had the following membership:

John Barry, Chairman  
Richard Goodwin, Co-chairman

John Earshen	Michael Valoski	Thomas Miller
Stephen Roth	Edwin Toothman	William R. Thornton
Carl Bohl	Terrence Dear	

Suggestions for improvement of this standard will be welcomed. They should be sent to Accredited Standards Committee S12, Noise, in care of the ASA Standards Secretariat, Acoustical Society of America, 120 Wall Street, 32nd Floor, New York, NY 10005-3993, USA. Telephone: 1 (212) 248-0373; FAX: 1 (212) 248-0146.

## American National Standard

# Measurement of Occupational Noise Exposure

## 1 Scope

### 1.1

This Standard provides procedures for the measurement of occupational noise exposure. The user of this Standard should be proficient, or under the direction of one who is proficient in noise measurement.

### 1.2

This Standard provides procedures for measuring the occupational noise exposure from all types of noise, e.g., continuous, fluctuating, intermittent and/or impulse/impact. Measurements may be reported as sound level with corresponding duration, time-weighted average sound level and/or noise dose.

### 1.3

This Standard provides for the measurement of the noise exposure of individuals and can be extended to representative groups performing similar activities. It can also be used to measure the noise exposure from a given job or activity.

### 1.4

This Standard does not provide procedures for the measurement of occupational noise exposure attributable to the use of earphones or telephone receivers.

## 2 Definitions and symbols

Some definitions and symbols contained in this document are unique to this Standard. Standard acoustical terminology defined in ANSI S1.1-1994 and other applicable Standards are not redefined in this document.

**Action level.** A specified value, which when a measured sound level or exposure equals or exceeds that value, certain actions are required.

**Activity.** Unique elements of an employee's work-shift that represent different noise exposure conditions during the work shift. All activities are comprised of one or more work tasks and/or events that can be definitely recognized and have specific beginning and ending points.

**Activity duration.** The activity duration is the duration of an activity duty cycle multiplied by the number of times the activity occurs per workday.

**Activity duty cycle.** The length of time required for all of the tasks comprising an activity to occur at least once and in proportion to their occurrence relative to other tasks associated with the activity.

**Allowed Exposure Time ( $T_i$ ).** Based on a specified criterion sound level (LC), criterion duration (TC) and exchange rate (Q), this is the allowed time of exposure at a given constant A-weighted sound level ( $L_i$ ). The relation is:

$$T_i = \frac{TC}{2^{[L_i - LC]/Q}}$$

**Average daily work shift.** If an employee works longer than a "normal" work shift, and the longer work shift is not a regularly scheduled occurrence, the average hours worked per day, based on a week, month, etc. time period (holidays and vacation excluded), may be used to determine the average daily work shift.

**Average sound level ( $L_{avg}$ ).** The logarithmic average sound level, using applicable exchange rate, during a measurement duration. Exposure to such an average level for the measurement duration would produce the same dose as the measured dose.

**Criterion duration (TC).** The duration in hours used as a basis for determination of noise exposure. Most common criterion duration is 8-hours.

**Criterion sound level (LC).** That constant sound level in decibels (dB), which, if it continues for the criterion duration, would provide 100% of an employee's allowable noise exposure.

**Exchange rate (Q).** The change in sound level corresponding to a doubling or halving of the duration of sound level that is considered to result in an equivalent amount of noise exposure.

**Eight-hour time-weighted average sound level ( $L_{TWA(8)}$ ).** The A-weighted constant sound level that would, in eight hours, expose a person to the same noise dose as did the actual time-varying sound