



Designation: E1179 – 07

# Standard Specification for Sound Sources Used for Testing Open Office Components and Systems<sup>1</sup>

This standard is issued under the fixed designation E1179; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification states the requirements for sound sources used for measuring the speech privacy between open offices or for measuring the laboratory performance of acoustical components (see Test Methods E1111 and E1130).

1.2 The sound source shall be a loudspeaker located in an enclosure driven with an appropriate test signal.

1.3 This specification describes the sound source and method of qualifying it using a special qualification signal. Test signals required by open office test methods may differ.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

C384 Test Method for Impedance and Absorption of Acoustical Materials by Impedance Tube Method

C634 Terminology Relating to Building and Environmental Acoustics

E1050 Test Method for Impedance and Absorption of Acoustical Materials Using A Tube, Two Microphones and A Digital Frequency Analysis System

E1111 Test Method for Measuring the Interzone Attenuation of Open Office Components

E1130 Test Method for Objective Measurement of Speech Privacy in Open Plan Spaces Using Articulation Index

### 2.2 ANSI Standards:

S1.4 Specification for Sound Level Meters<sup>3</sup>

S1.6 Preferred Frequencies, Frequency Levels, and Band Numbers for Acoustical Measurements<sup>3</sup>

S1.11 Specification for Octave Band and Fractional OB Analog and Digital Filters<sup>3</sup>

S1.43 Specifications for Integrating-Averaging Sound Level Meters<sup>3</sup>

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee E33 on Building and Environmental Acoustics and is the direct responsibility of Subcommittee E33.02 on Open Plan Spaces.

Current edition approved Oct. 1, 2007. Published November 2007. Originally approved in 1987. Last previous edition approved in 2003 as E1179 – 87 (2003). DOI: 10.1520/E1179-07.

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

## 3. Terminology

### 3.1 Definitions:

3.1.1 The acoustical terminology used in this specification is consistent with Terminology C634.

### 3.2 Descriptions of Terms Specific to This Standard:

3.2.1 *directivity measurement*—the measurement used to determine directivity as defined in 4.2.

3.2.2 *qualification signal*—a test signal of broadband noise or bands of white or pink noise as defined in Terminology C634.

3.2.3 *source point*—the point at which the loudspeaker axis intersects the front plane of the loudspeaker (see Fig. 1).

3.3 The following terms in this standard have specific meanings that are defined in Terminology C634:

3.3.1 *background noise*,

3.3.2 *pink noise*,

3.3.3 *sound pressure level*, and

3.3.4 *white noise*

## 4. Sound Source Specifications

4.1 *Sound Source Description*—The sound source shall be a loudspeaker enclosed in a box that has a maximum dimension of 0.30 m (1 ft) on a side, to reduce spurious sound reflections.

4.2 *Directivity*—With the source driven with the qualification signal, the maximum and minimum sound pressure levels within any one-third octave band, from 200 to 3150 Hz measured at a distance of 1.0 m (39 in.) from the source point, at any angle up to and including 25° in any direction from the loudspeaker axis, shall differ by 2 dB or less. At frequencies above 3150 Hz, the difference can be 3dB or less.

NOTE 1—At angles beyond 25° from the loudspeaker axis, the source shall produce lower levels than within the 50° included angle.

NOTE 2—The directivity requirement may be met by using more than one loudspeaker, each one used separately to cover a different portion of the test frequency range.

## 5. Source Qualification

5.1 *Test Environment*—The measurements shall be carried out in a free sound field. The preferred test environment is an anechoic room with surfaces that have a minimum normal incidence sound absorption coefficient of 0.990 at all frequencies above 175 Hz as measured in accordance with Test Methods C384 or E1050 or, by the use of other methods, can