



Designation: C423 – 17

Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method¹

This standard is issued under the fixed designation C423; 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 (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This test method covers the measurement of sound absorption in a reverberation room by measuring decay rate. Procedures for measuring the absorption of a room, the absorption of an object, such as an office screen, and the sound absorption coefficients of a specimen of sound absorptive material, such as acoustical ceiling tile, are described.

1.2 *Field Measurements*—Although this test method covers laboratory measurements, the test method described in 4.1 can be used for making field measurements of the absorption of rooms (see also 5.5). A method to measure the absorption of rooms in the field is described in Test Method E2235.

1.3 This test method includes information on laboratory accreditation (see Annex A1), asymmetrical screens (see Annex A2), and reverberation room qualification (see Annex A3).

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards*:²

C634 Terminology Relating to Building and Environmental Acoustics

E795 Practices for Mounting Test Specimens During Sound Absorption Tests

E2235 Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods

2.2 *ANSI Standards*:

S1.6 Preferred Frequencies, Frequency Levels, and Band Numbers for Acoustical Measurements³

S1.11 Specification for Octave-Band and Fractional-Octave-Band Analog and Digital Filters³

S1.26 Method for the Calculation of the Absorption of Sound by the Atmosphere³

S1.43 Specifications for Integrating-Averaging Sound Level Meters³

2.3 *IEC Standards*

IEC 61672 Electroacoustics—Sound Level Meters—Part 1: Specifications³

2.4 *ASTM Adjuncts*:

Historical Applications Note on Sound Absorber⁴

3. Terminology

3.1 Except as noted in 3.3, the terms and symbols used in this test method are defined in Terminology C634. The following definition is not currently included in Terminology C634:

3.1.1 *sound absorption average, SAA*—a single number rating, the average, rounded off to the nearest 0.01, of the sound absorption coefficients of a material for the twelve one-third octave bands from 200 through 2500 Hz, inclusive, measured according to this test method.

3.1.1.1 *Discussion*—The sound absorption coefficients shall be rounded off to the nearest 0.01 before averaging. If the unrounded average is an exact midpoint, round to the next higher multiple of 0.01. For example, report 0.625 as 0.63.

3.2 In previous versions of this test method a single number rating, called the noise reduction coefficient (NRC), was defined as follows:

¹ This test method is under the jurisdiction of ASTM Committee E33 on Building and Environmental Acoustics and is the direct responsibility of Subcommittee E33.01 on Sound Absorption.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

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

⁴ A drawing of this specimen is available at a nominal charge from ASTM International Headquarters. Order Adjunct No. ADJC0423.