



Classification for Rating Sound Insulation¹

This standard is issued under the fixed designation E413; 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 classification covers methods of calculating single-number acoustical ratings for laboratory and field measurements of sound attenuation obtained in one-third octave bands.

1.2 The name given to the single-number rating is assigned by the test method that invokes this classification.

1.3 Test methods that invoke this classification include:

1.3.1 *Test Method E90*—The single-number rating is called sound transmission class (STC).

1.3.2 *Test Method E336*—Single number ratings are noise isolation class (NIC), normalized noise isolation class (NNIC), apparent sound transmission class (ASTC), and field sound transmission class (FSTC).

1.3.3 *Test Method E596*—The single-number rating is called noise isolation class (NIC).

1.3.4 *Test Method E1414*—The single-number rating is called ceiling attenuation class (CAC).

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

2. Referenced Documents

2.1 *ASTM Standards*:²

C634 Terminology Relating to Building and Environmental Acoustics

E90 Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

E336 Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings

E596 Test Method for Laboratory Measurement of Noise Reduction of Sound-Isolating Enclosures

¹ This classification is under the jurisdiction of ASTM Committee E33 on Building and Environmental Acoustics and is the direct responsibility of Subcommittee E33.03 on Sound Transmission.

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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.

E1332 Classification for Rating Outdoor-Indoor Sound Attenuation

E1414 Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum

2.2 *ISO Standard*:³

ISO 717 Rating of Sound Insulation for Dwellings

3. Terminology

3.1 The following terms used in this classification are defined in Terminology **C634**:

airborne sound,
field sound transmission class,
level,
noise isolation class,
noise reduction,
normalized noise isolation class,
one-third octave band,
sound insulation,
sound isolation, and
sound transmission loss.

4. Significance and Use

4.1 These single-number ratings correlate in a general way with subjective impressions of sound transmission for speech, radio, television, and similar sources of noise in offices and buildings. This classification method is not appropriate for sound sources with spectra significantly different from those sources listed above. Such sources include machinery, industrial processes, bowling allies, power transformers, musical instruments, many music systems, and transportation noises such as motor vehicles, aircraft and trains. For these sources, accurate assessment of sound transmission requires a detailed analysis in frequency bands. A single-number sound transmission rating for building façade elements is given in Classification **E1332**.

4.2 The single-number ratings obtained can be used to compare the potential sound insulation of partitions or floors tested in laboratory conditions (STC) or the actual sound insulation between different suites in buildings (NNIC, NIC).

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