



## Classification for Rating Sound Insulation<sup>1</sup>

This standard is issued under the fixed designation E 413; 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 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 E 90*—The single-number rating is called sound transmission class (STC).

1.3.2 *Test Method E 336*—Single-number ratings are field sound transmission class (FSTC), noise isolation class (NIC), and normalized noise isolation class (NNIC).

1.3.3 *Test Method E 596*—The single-number rating is called noise isolation class (NIC).

1.3.4 *Test Method E 1414*—The single-number rating is called ceiling attenuation class (CAC).

### 2. Referenced Documents

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

- C 634 Terminology Relating to Environmental Acoustics
- E 90 Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- E 336 Test Method for Measurement of Airborne Sound Insulation in Buildings
- E 596 Test Method for Laboratory Measurement of Noise Reduction of Sound-Isolating Enclosures
- E 1332 Classification for Determination of Outdoor-Indoor Transmission Class
- E 1414 Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum

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

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<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.

#### 2.2 *ISO Standard:*<sup>3</sup>

ISO 717 Rating of Sound Insulation for Dwellings

### 3. Terminology

3.1 The following terms used in this classification are defined in Terminology C 634:

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 E 1332.

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 isolation between different suites in buildings (NNIC, NIC). The rating for a partition built and tested in a building may be lower than that obtained for a partition tested in a laboratory because of flanking transmission or construction errors.

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