



Designation: E3207 – 21

Standard Classification for Determination of Low-Frequency Impact Noise Ratings¹

This standard is issued under the fixed designation E3207; 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.

1. Scope

1.1 This classification provides methods for calculating single-number ratings of low-frequency impact noise transmission, based on one-third-octave-band impact noise levels as described in Test Methods E492 and E1007.

1.2 This classification defines ratings that are not defined in other standards. Other standards may define additional ratings based on the methods of this classification.

1.3 *Units*—The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

C634 Terminology Relating to Building and Environmental Acoustics

E492 Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine

E989 Classification for Determination of Single-Number Metrics for Impact Noise

E1007 Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-

Ceiling Assemblies and Associated Support Structures

3. Terminology

3.1 *Definitions*—The following terms used in this classification have specific meaning that are defined in Terminology C634: average sound pressure level; decibel; flanking transmission; impact insulation class; level; octave band; sound insulation; sound isolation; sound pressure; sound pressure level.

3.2 *Definitions*—The following terms used in this classification have specific meaning that are defined in Test Method E492: normalized sound pressure level, L_n .

3.3 *Definitions*—The following terms used in this classification have specific meaning that are defined in Test Method E1007: impact sound pressure level, ISPL.

3.4 *Definitions of Terms Specific to This Standard:*

3.4.1 *low-frequency impact insulation class, LIIC, n*—of a floor ceiling assembly installed in a laboratory, the single-number rating calculated in accordance with this classification using the normalized sound pressure levels (L_n) measured as described in Test Method E492.

3.4.1.1 *Discussion*—This classification method uses the L_n in the 50, 63, and 80 Hz one-third-octave bands. Measurement of these bands is described as desirable but not required in Test Method E492. Measurement in these bands is required in order to calculate LIIC.

3.4.1.2 *Discussion*—Except for the frequency range, no change in Test Method E492 is required to measure LIIC.

3.4.2 *low-frequency impact rating, LIR, n*—the single number rating calculated in accordance with this classification using the impact sound pressure levels (ISPL) measured in a building, as described in Test Method E1007.

3.4.2.1 *Discussion*—This classification method uses the ISPL in the 50, 63, and 80 Hz one-third-octave bands. Measurement of these bands is described as desirable but not required in Test Method E1007. Measurement in these bands is required in order to calculate LIR.

3.4.2.2 *Discussion*—Except for the frequency range, no change in Test Method E1007 is required to measure LIR.

4. Significance and Use

4.1 The purpose of the LIR rating is to describe the low-frequency impact noise, often referred to as “thudding,”

¹ This classification is under the jurisdiction of ASTM Committee E33 on Building and Environmental Acoustics and is the direct responsibility of Subcommittee E33.10 on Structural Acoustics and Vibration.

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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.