Designation: E 2249 – 02

Standard Test Method for Laboratory Measurement of Airborne Transmission Loss of Building Partitions and Elements Using Sound Intensity[1]

This standard is issued under the fixed designation E 2249; 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.

INTRODUCTION

This standard test method is part of a set for evaluating the sound transmission loss of a partition or partition element under laboratory conditions. It differs from Test Method E 90 in that the sound power radiated by the element under test is measured directly using an intensity probe rather than indirectly from the space averaged receiver room sound pressure and the room reverberation time. This test method is especially useful when the receiver room requirements of Test Method E 90 can not be achieved, or flanking sound involving the receiver room surfaces is present but its influence is to be circumvented **(1)**[2], as discussed in Annex A3.

Others test methods to evaluate sound insulation of building elements include: Test Method E 90, airborne transmission loss of an isolated partition element in a controlled laboratory environment, Test Method E 492, laboratory measurement of impact sound transmission through floors, Test Method E 336, measurement of sound isolation in buildings, Test Method E 1007, measurement of impact sound transmission in buildings, Guide E 966, measurement of sound transmission through building facades and facade elements.

1. Scope

1.1 This test method covers the measurement of airborne sound transmission loss of building partitions such as walls of all kinds, operable partitions, floor-ceiling assemblies, doors, windows, roofs, panels and other space-dividing building elements. It may also be have applications in sectors other than the building industry, although these are beyond the scope.

1.2 The primary quantity reported by this standard is Intensity Transmission Loss (ITL) and shall not be given another name. Similarly, the single-number rating Intensity Sound Transmission Class (ISTC) derived from the measured ITL shall not be given any other name.

1.3 This test method may be used to reveal the sound radiation characteristics of a partition or portion thereof.

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

NOTE 1—The method for measuring the sound intensity radiated by the building element under test defined by this ASTM standard meets or exceeds those of ISO 15186-1. Special consideration will have to be given to requirements for the source room and specimen mounting if compliance with ISO 15186-1 is also desired as they differ from those of this standard.

2. Referenced Documents

2.1 *ASTM Standards:*

C 634 Terminology Relating to Environmental Acoustics[3]

E 90 Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements[3]

E 336 Test Method for Measurement of Airborne Sound Insulation in Buildings[3]

E 413 Classification for Rating Sound Insulation[3]

2.2 *ANSI Standards:*[4]

S1.9 Instruments for the Measurement of Sound Intensity

S1.11 Specification for Octave-Band and Fractional Octave-Band Analogue and Digital Filters

2.3 *ISO Standards:*[4]

ISO 140-3 Acoustics—Measurement of Sound Insulation in Buildings and of Building Elements—Part 3: Laboratory Measurements of Sound Insulation of Building Elements

ISO 9614-1 Acoustics—Determination of Sound Power

[1] This test method 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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[2] The boldface numbers in parentheses refer to the list of references at the end of this standard.

[3] *Annual Book of ASTM Standards*, Vol 04.06.

[4] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

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