



Standard Test Method for Field Measurement of Tapping Machine Impact Sound Transmission Through Floor-Ceiling Assemblies and Associated Support Structures¹

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INTRODUCTION

This test method is part of a set of standards for evaluating the sound insulating properties of building elements and sound isolation between spaces. It is designed to measure in the field the impact sound isolation between rooms or to estimate lower limits for impact sound transmission through a floor-ceiling partition element installed as an interior part of a building using a standard tapping machine. Others in the set cover measurement of impact sound transmission through an isolated floor-ceiling assembly in a controlled laboratory environment (Test Method E492), the measurement of airborne sound transmission loss of an isolated partition element in a controlled laboratory environment (Test Method E90), the measurement of airborne sound isolation and airborne sound transmission loss associated with building elements in the field (Test Method E336), the measurement of sound transmission through building facades and facade elements in the field (Guide E966); and the measurement of sound transmission through a common plenum between two rooms in a controlled laboratory environment (Test Method E1414).

1. Scope

1.1 This test method covers the measurement of the transmission of impact sound generated by a standard tapping machine through floor-ceiling assemblies and associated supporting structures in field situations.

1.2 Measurements may be conducted on all types of floor-ceiling assemblies, including those with floating-floor or suspended ceiling elements, or both, and floor-ceiling assemblies surfaced with any type of floor-surfacing or floor-covering materials.

1.3 This test method defines several procedures and metrics to assess either the apparent performance of the nominally separating floor-ceiling or the isolation of a receiving room from the sound produced by the operation of the tapping machine. The receiving room may be the space directly below the tapping machine or, in some cases, any separated space that receives sound from the operation of the tapping machine. The source and receiving rooms as well as the floor-ceiling system are identified and described in the test report. All measured

levels and derivative single number ratings include the effect of flanking transmission. Efforts to suppress flanking are not permitted. Available measures and their single number ratings are the impact sound pressure levels (ISPL) and impact sound rating (ISR), the reverberation time normalized impact sound pressure levels (RTNISPL) and normalized impact sound rating (NISR), and the absorption normalized impact sound pressure levels (ANISPL) and apparent impact insulation class (AIIC).

1.4 The ISPL and ISR may be measured and reported between any two specific rooms or usage areas where the source room area is large enough to accommodate the tapping machine positions and the receiving room volume is sufficiently large to accommodate the microphone positions. For all other measures and ratings in this standard, restrictions such as minimum room volume or dimensions or maximum room absorption are imposed. Thus, conditions may exist that will not allow RTNISPL (NISR) or ANISPL (AIIC) to be determined.

1.5 Where a separating floor-ceiling assembly is composed of parts that are constructed differently on the receiving room (ceiling) side, it is not possible to determine the ANISPL and AIIC of the individual elements or portions of the assembly. In this situation, the measurement will be of the composite structure, not of an individual element.

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

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