Understanding Acoustics Testing for Commercial Flooring

A CONCISE OVERVIEW

Introduction

In today's commercial environments, acoustic performance is more than a nice-to-have—it's a necessity. Whether in multifamily housing, office buildings, hospitality spaces, senior living, healthcare, education, or retail spaces, a flooring system's ability to manage sound transmission directly affects occupant comfort and code compliance. The tests discussed here measure how well a system isolates or transmits sound, giving a clear way to evaluate performance. While several acoustic metrics exist, including High Impact Insulation Class (HIIC) and Noise Reduction Coefficient (NRC), Sound Transmission Class (STC) and Impact Insulation Class (IIC) remain the most widely used and recognized standards for evaluating flooring system performance.

This brief introduces the core acoustic testing methods for sound isolation and transmission used in flooring evaluations to help decision makers understand which metrics matter—and why. As acoustic modeling becomes a standard part of early design, having reliable test data is increasingly essential for accurate predictions and informed specifications.

Comparison of Acoustic Metrics

METRIC	Sound Transmission Class STC 	Impact Insulation Class IIC 
WHAT IT MEASURES	**Airborne sound transmission** Airborne sound transmission loss gauged in decibels (dB)	**Structure-borne impact noise: impact sound isolation in decibels (dB)** These are the heavy footfall "thuds" that travel through structure—what occupants often describe as "booming" or "banging."
WHERE IT'S USED IN BUILDINGS	Upper floor installations; STC is a single-number rating for airborne sound transmission through any building element that separates two spaces.	Sound transmission through floor/ceiling structures.
LIMITATIONS/ MISUNDERSTANDINGS	Not suitable for impact noise; Applies to Walls, floor/ceiling assemblies, doors, windows, demising partitions, operable partitions and glazing systems.	Doesn't assess airborne sound.

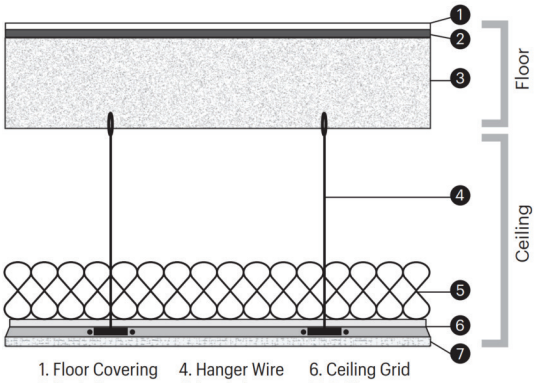
Flooring Comparison Across Acoustic Metrics

FLOORING TYPE	STC	IIC
Bare Concrete	50	25
Modular Carpet with attached cushion	61	72
2.0mm LVT	60	50
2.5mm LVT	60	52
3.0mm LVT	60	56
4.5mm LVT	63	55
4.5mm Click LVT	50	58
5.0mm LVT	61	58
6.0mm Click LVT	52	68
4.0mm Rubber	53	56
8.0mm Rubber	53	59

NOTE: All testing is done with a 6" concrete slab and a drop ceiling

Design Considerations

- Modular carpet with attached cushion consistently leads in acoustic metrics.
- LVT offers moderate isolation performance, with higher isolation values achieved as LVT thickness increases.
- Bare concrete provides mass for airborne sound isolation (STC), but fails dramatically on impact isolation and absorption, making additional systems essential.



Closing Thoughts and What's Next

Acoustic ratings offer valuable insight, but they're only part of the story. Lab values provide a benchmark, yet real-world performance depends on installation, assemblies, and how people use a space. At the same time, understanding STC and IIC is increasingly important as teams rely on acoustic modeling earlier in the design process. Modeling turns raw data into practical predictions, helping planners understand how a system will perform once installed. In short, acoustic ratings are essential, but not sufficient on their own—context, modeling, and real-world conditions all shape the occupant experience.

Bibliography

ASTM International. Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements. ASTM E90-09. West Conshohocken, PA: ASTM International, 2009.

Beranek, Leo L. Acoustics. New York: Acoustical Society of America, 1996.

International Organization for Standardization. Acoustics — Measurement of Sound Absorption in a Reverberation Room. ISO 354:2003. Geneva: ISO, 2003.