



Acoustical Testing 101:

What Manufacturers, Engineers, and Architects Need to Know





Why Acoustical Testing Matters

In a world where comfort, privacy, and code compliance are non-negotiable, acoustical testing isn't optional — it's essential. It measures how well a product or assembly blocks, absorbs, handles, or shapes sound, providing the critical data needed to design and build better environments.

From complete wall systems to the individual studs, sheathing, and insulation within them, each building product participates in overall acoustical performance.

Reliable acoustic test results give manufacturers, builders, and designers the quantifiable metrics they need to validate performance, meet regulations, and stand out in a crowded market. Certified ratings, such as Sound Transmission Class (STC) or Noise Reduction Coefficient (NRC), serve as powerful proof points that support product and system credibility.

Still, most companies aren't equipped to handle this testing in-house. That's where third-party expertise comes in.

An accredited lab like NGC Testing Services removes the guesswork, accelerates the process, and delivers trusted, third-party validation.

NGC Testing Services has been a leader in acoustical testing for over 60 years. As one of the first labs accredited by the National Voluntary Laboratory Accreditation Program (NVLAP), we're fully certified to test your products and assemblies against today's most critical standards.





Key Testing Standards Explained

Whether you're validating product performance, pursuing certifications, or ensuring code compliance, understanding the relevant acoustical standards is crucial.

Here's an overview of the key standards NGC Testing Services provides expertise in:

Airborne Sound Transmission (Walls, Floors, Doors, Windows)

ASTM E90

Evaluates the airborne sound transmission loss of building partitions and elements. Results produce an STC rating using two adjacent reverberation rooms separated by the test specimen.

ISO 10140-2

International standard for laboratory measurement of airborne sound insulation of building components, such as walls, floors, doors, windows, shutters, façade elements, and glazing.

ASTM E413

A Standard Classification that converts detailed transmission loss data into single-number ratings like STC. Commonly used in codes and specifications as an easy to understand value that represents how well building elements reduce speech and media-related sound transmission.

Impact Sound Transmission (Floor-Ceiling Assemblies)

ASTM E492

Measures impact noise (e.g., footsteps) transferred from one floor level to another using a standardized tapping machine.

ASTM E989

A Standard Classification that outlines how to calculate the Impact Insulation Class (IIC) from ASTM E492 test data. It provides a consistent, single-number rating system for comparing the impact sound performance of different floor-ceiling assemblies.

ASTM E2179

Measures the improvement in impact sound insulation (Delta IIC) when a floor covering is added to a concrete subfloor.

ASTM E3222

Provides ratings for high-frequency impact noise (HIIC), which standard IIC tests may overlook. Useful for multifamily and commercial spaces.





Absorption and Reverberation Control

ISO 354

Calculates the Sound Absorption Coefficient of materials by comparing decay rates in a reverberation room with and without the test product.

ASTM C423

North American standard for sound absorption testing. Results include the Noise Reduction Coefficient (NRC) and Sound Absorption Average (SAA).

ASTM E795

A Standard Practice that specifies mounting methods for sound absorption tests, ensuring consistent and comparable results across different products and laboratory setups.

Sound Transmission in Office Spaces

ASTM E1111

Assesses sound reduction over open-plan office components to determine Articulation Class (AC) for speech privacy.

ASTM E1110

A Standard Classification that provides a single-number Articulation Class (AC) rating, used to compare how effectively different systems reduce speech intelligibility between zones in open-plan spaces.

ASTM E1414

Measures sound transmission through walls with shared ceiling plenums, calculating the Ceiling Attenuation Class (CAC).

Exterior to Interior Noise Transmission

ASTM E1332

A Standard Classification used to determine the Outdoor-Indoor Transmission Class (OITC), a rating that evaluates how well building façade elements block transportation-related outdoor noise.



What to Know Before You Test

Before submitting materials for testing, it's important to understand the requirements that ensure a smooth, efficient, and accurate process. This includes knowing which tests are needed, as well as preparing the right supporting information.

In addition to identifying the type of testing required, clients should provide the following:

- Assembly instructions or drawings (especially for multi-component systems)
- Installation details or typical use-case descriptions
- Preferred mounting method for the test
- Special installation requirements or accessories
- Frequency range of interest (if not standard)
- Prior test data or reference samples (if available)
- Relevant environmental conditions (if they affect performance)
- Special handling, storage, or safety instructions for the sample

Sample size is also critical. The type of testing will determine how large the sample needs to be to meet testing standards. If you're unsure of the exact requirements, contact your testing provider in advance to avoid delays or retesting due to incorrect sizing.



The Testing Process: What to Expect

Thanks to recent advancements in technology, obtaining accurate, certified acoustical test results from NGC Testing Services is faster and more efficient than ever.

Much of this efficiency comes from significant updates to our data acquisition systems, including advanced software and hardware that significantly reduce testing times.

Currently, the most time-intensive aspect of acoustical testing is often the physical setup of the test specimen.

Each product or assembly must be carefully installed in a controlled environment that meets compliance and performance standards. Proper mounting and preparation are essential for ensuring test results are accurate, reliable, and comparable across different labs and projects.



Despite the speed improvements, NGC Testing Services maintains a rigorous commitment to accuracy and detail in every final report. Clients can expect comprehensive documentation, including:

- Unique report number, date, and version
- Name and address of the testing laboratory
- Client and project information
- Summary of results
- Detailed description of the product or assembly, including materials, dimensions, and installation method
- Diagrams, photographs, or illustrations for clarity
- List of testing standards and procedures used
- Description of the test environment and setup
- Step-by-step testing procedure
- Mounting and installation details (referencing ASTM or ISO methods, as applicable)
- Environmental conditions during testing (e.g., temperature, humidity)
- Raw data and calculated results (with explanations of methodologies and corrections)
- Single-number ratings (e.g., STC, NRC, IIC)
- Compliance statement
- Signatures and approvals by qualified laboratory personnel

Each report is reviewed and signed by an authorized expert at our NVLAP-accredited laboratory, promoting third-party credibility and acceptance by acousticians, architects, builders, and other key stakeholders.





Common Mistakes to Avoid

While modern technology has greatly improved testing speed and efficiency, acoustical testing remains a complex process. Clients can still encounter delays or disruptions if key steps are overlooked.

Here are some of the most common pitfalls to avoid:



Submitting Incomplete or Inaccurate Samples

Each test has specific sample or assembly requirements, including size, construction, and installation method. If a sample is incomplete, incorrectly assembled, or not representative of the final product, the results may not be valid, or the sample may need to be retested entirely.



Misinterpreting Test Results

Acoustical testing involves technical terminology and data that can be misunderstood without proper context. Confusion between terms like decibels, sound power level, and sound pressure level is common. Clients unfamiliar with these concepts may misread the data or draw incorrect conclusions.



Not Preparing for Potential Re-Tests

If a product or assembly fails to meet a required performance standard, additional testing may be necessary. While this can be frustrating, re-testing is a regular part of ensuring consistent, high-quality, and standards-compliant results.



Expecting Design or Product Development Consulting

NGC Testing Services provides objective, third-party data, not product design recommendations. Our role is to accurately measure and report how your product performs against specific standards. While our reports are a valuable tool in product development, we do not advise on material modifications or performance improvements.



How to Get the Most From Your Acoustical Testing Lab

Partnering with a lab like NGC Testing Services streamlines the testing process, helping you bring verified, competitive products to market quickly and confidently. Beyond speed, we offer decades of expertise, full NVLAP accreditation, and nine fully isolated, state-of-the-art acoustical chambers all under one roof.

Whether you're a startup or an established manufacturer, NGC Testing Services provides one of the most comprehensive independent testing facilities in North America.



Our Facilities

PARTITION SOUND TRANSMISSION LOSS CHAMBERS

Used to determine STC for partitions, walls, doors, windows, and other barriers.

CEILING ATTENUATION CHAMBERS

Measures CAC for ceiling tiles, suspended/drop ceiling systems, and other ceiling assemblies.

SOUND ABSORPTION CHAMBER

Determines the NRC of materials such as ceiling tiles, finishes, insulation, office screens, baffles, and curtains.

FLOOR-CEILING CHAMBERS

Versatile chambers used to determine STC, IIC, and Delta IIC. Equipped with overhead crane systems and a range of different, pre-built test frames, they're ideal for evaluating floor-ceiling assemblies.

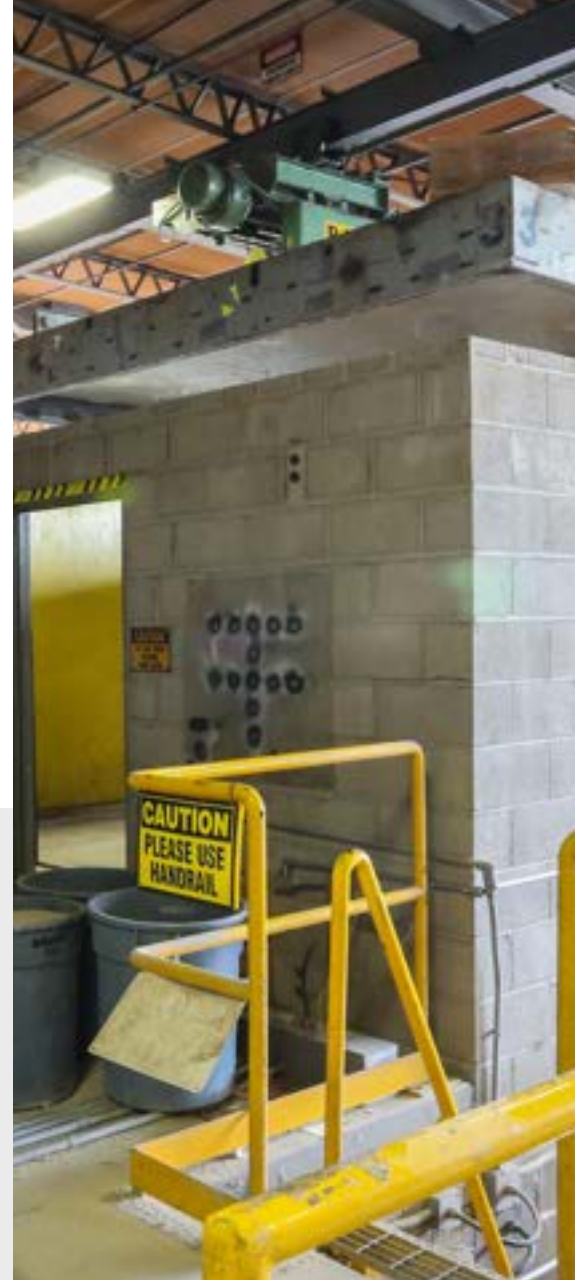
HEMI-ANECHOIC TEST CHAMBER

Primarily used to measure ceiling panel performance in open office environments, and can also capture sound pressure levels for various types of equipment.

Complementary Testing Services

In addition to acoustical testing, NGC Testing Services provides a full range of testing capabilities, including fire, structural, and analytical/physical testing, making us a true one-stop solution for clients who need to bundle multiple test types under one roof.

For example, a client launching a new ceiling tile may require both acoustical and fire performance data to meet building code requirements. We can deliver both through coordinated, comprehensive testing, streamlining timelines and reducing logistical complexity.



Questions to Ask Your Testing Provider

The best way to ensure your test runs smoothly is to understand the process and how it applies to your specific product. Don't hesitate to ask questions. Being informed and confident before testing begins can save time, reduce errors, and help you get the most value from the experience. Questions to ask before scheduling a test include:

- What is the cost of testing?
- What is the purpose and scope of this test?
- What documentation or product information do I need to provide?
- What are the sample size and preparation requirements?
- How will the sample and test setup be prepared?
- What is the expected turnaround time?
- Can I observe the testing process?
- Who will oversee the test, and what are their qualifications?
- If the product fails or an issue arises, what is the retesting policy?
- What details are included in the final report?
- Who certifies or signs the report?
- Will the results be accepted by regulatory bodies, specifiers, or clients?
- Are there any cancellation or rescheduling fees?

Asking these questions upfront ensures clear expectations, minimizes surprises, and sets your project up for success from day one.



For 60 years, NGC Testing Services has been a trusted partner for comprehensive acoustical, fire, structural/physical, and analytical testing — all under one roof. Our fully accredited facility conducts testing to the highest standards established by leading regulatory bodies.

With nine large-scale, fully isolated acoustical chambers, we're equipped to handle oversized samples and unconventional materials, delivering fast, accurate results. And by offering bundled testing services, such as fire and acoustical testing, we streamline timelines and reduce project complexity for our clients.

When it comes to testing, NGC Testing Services has the answers. Contact us today to speak with our experts or schedule a visit to our Buffalo, NY, facility. We're here to help you move forward with confidence.

CONTACT US

Acoustical performance test report. (n.d.). <https://kineticsnoise.com/files/content/downloads/analysis/RT-7-STC-60-Acoustical-Performance-Report.pdf>

NGC testing services: Acoustical, fire, structural, analytical. NGC Testing Services | Acoustical, Fire, Structural, Analytical. (n.d.). <https://www.ngctestingservices.com/>

Standards products - standards & publications - products & services. ASTM International. (n.d.). <https://store.astm.org/products-services/standards-and-publications/standards.html>

Standards. ISO. (2024, January 24). <https://www.iso.org/standards.html>