Why Reported Acoustic Performance Can Vary Between Panel Manufacturers




Typical Industry Standard Acoustic Panel Components

- The industry standard fiberglass acoustic insulation is a nominal 6-7 PCF density core available from Johns Manville, Owens Corning and Knauf. All manufacturers report similar acoustic performance and NRC for unfinished 1" and 2" thick panels.

- Acoustically transparent fabric is used by fabric wrapped panel manufacturers for acoustic testing and project applications. Guilford of Maine FR-701 is an industry standard fabric.

Applicable ASTM Acoustic Test Standards

- Fabric wrapped acoustic panels must be tested to ASTM C423, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- Also panels are mounted in the reverberation room test chamber per ASTM E795, Standard Practices for Mounting Test Specimens During Sound Absorption Tests

IMPORTANT:

To ensure the accuracy and repeatability of test results, testing should be performed by an accredited testing Laboratory.

U.S. Fiberglass Manufacturers of Acoustic / Thermal Insulation Cores

- Johns Manville, Whispertone Acoustic Board, Density 6 PCF
- Owens Corning, 700 Series Acoustic Board, Density 6-7 PCF
- Knauf, OEM-ASB (Acoustical Smooth Board), Density 6 PCF

Mftr. Core board NRC Values reported Per ASTM C423, <u>with Type A Mounting</u>

Owens Corning	Johns Manville	Knauf
1″ – 0.75	1″ – 0.75	1″ – 0.80
2″ – 1.05	2″ – 1.00	2″ – 1.00

Per ASTM C423 Standard:
NRC Value is the average of the sound absorption coefficients at 250, 500, 1000 and 2000 Hz. absorption values, rounded to the nearest 0.05.

Reported NRC results can yield what appears to be a significant difference however the actual difference may be undetectable.

<u>Theoretical Example</u>:
The average of the 4 frequencies for a 1” thick panel is 0.774. Another product 4 frequency average is 0.775. Per ASTM C423 Standard, 0.774 is rounded down to 0.75 NRC, where 0.775 is rounded up to 0.80 NRC

The actual product difference across the 4 primary frequencies of **0.001** is insignificant, yet the NRC value reported may appear to be significant.

The Test Facility Can Impact Acoustic Data

Primary panel components are common across the industry

- Comparing current panel published literature from several leading manufacturers for similar constructed panels, using the same mounting method, yields fairly consistent results when tested at an accredited facility.
- However, not all manufacturers test at accredited facilities.
- Concern: A manufacturer recently reported acoustic data for a typical panel constructed with common panel components. The reported data was considerably better than data reported by other leading panel manufacturers.
- It was discovered that reported test data was not generated by an accredited lab but by a small, defunct consulting company 25 years ago.
- Important Note: Acoustic test standards change over the years. For example, test chamber conditioning and panel mounting standards have been updated during this time.
- **Summary** – Acoustic test results developed by non accredited test facility may not be reliable. Accredited test labs must demonstrate ongoing compliance to established testing standards and practice.

All Published Acoustic Data is Not the Same

To ensure the accuracy and repeatability of lab test results, product testing should be performed at an Accredited testing Laboratory.

- **The International Accreditation Service** (IAS) provides objective evidence that an organization operates at the highest level of ethical, legal and technical standards. IAS is a nonprofit, public-benefit corporation that has been providing accreditation services since 1975. It is a subsidiary of the International Code Council (ICC), a professional membership association that develops the construction codes and standards used by most municipalities within the United States. IAS accreditation programs are based on recognized national and international standards that ensure domestic and/or global acceptance of its accreditations.
- **National Voluntary Laboratory Accreditation Program** (NVLAP) is a National Institute of Standards and Technology (NIST) program in the USA which provides an unbiased third-party test and evaluation program to accredit laboratories in their respective fields to the ISO 17025 standard. NVLAP is in compliance with ISO 17011.

Important Considerations Regarding Panel Acoustic Performance

- Industry standard 6-7 PCF fiberglass acoustic panels provide best absorption at mid to high frequencies.
- Fabric wrapped panel manufacturers can test using different mounting methods as detailed under ASTM E795.
- The mounting method can significantly impact acoustic test results. Therefore it's critical that the mounting method used during testing be specified with reported test results.
- If panel edges are exposed in the actual installation, then panel edges are not covered by a wood or metal frame during the lab test. This applies to Type A or Type F mounting. The test report needs to state if edges were sealed or not.
- Panels with unsealed edges can achieve higher sound absorption coefficients and NRC ratings VS sealed edges.
- Per ASTM E795, the Mounting Type detail used during testing should reflect the actual project mounting conditions. Otherwise reported test results will not reflect project application performance.

ASTM E795, Common Acoustic Panel Mounting Methods

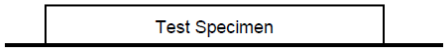
A Mount - Sample laid directly against the test surface with no airspace behind the panel. If the perimeter edges of the sample are exposed during the actual installation, they are not sealed during the test.

D Mount - Sample is mounted on wood furring strips spaced 300 mm (12") on center to create and air space between the back of the sample and the test surface. The perimeter edges of the sample must be sealed with a wood or metal frame.

F Mount – Sample laid against the test surface with mounting clips that would be used for the actual installation. The suffix of the mounting designation shall be the actual size of the spacers rounded to the nearest integral multiple of 5 mm for spacers 10 mm thick or greater and to the nearest integral multiple of 1 mm for those less than 10 mm. If the perimeter edges of the test specimen are not exposed in normal use, seal them with wood or metal frame

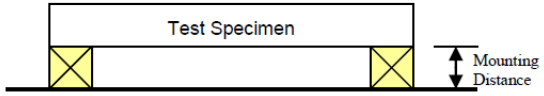
Common Mounting Methods

Type A – Specimen is placed directly on top of the floor. Intended for carpet, wall panels, or any product will be laid directly on floor or attached to a wall with adhesive or mechanical fasteners.



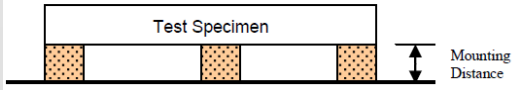
Reflects Mounting With:
Adhesive
Hook n Loop (aka Velcro)
Impaling Clip, Z Clip
and other direct mount methods

Type D – Specimen is separated from the floor with wood furring strips.



The typical size for furring strips is 20 by 40 mm (¾" by 1 ½"). This is a **D20** Mounting

Type F – Specimen is separated from floor with spacers. Intended to simulate normal use of a product containing spacers or spacing clips.



An **F-25** mount would use 1" spacer clips

The Mounting Method Can Significantly Impact Test Results

- ASTM E795 Mounting Types are intended to reflect actual field installation conditions.
- Test results are only relevant for materials installed with the same mounting method.
- Some manufacturer testing references ASTM C423 test method but fail to report the specific Mounting Type used per ASTM E795. Without this information the Designer / User cannot assume the performance reported will be achieved with the actual project Installation.
- In a documented example a 1" thick panel achieved a 12.5% NRC improvement by using a Type D20 VS Type A Mounting.
- Summary - Panel test data that matches actual project mounting conditions will provide more reliable project results.

Type A Mounting - Test specimen placed directly on chamber floor with exposed panel edges.

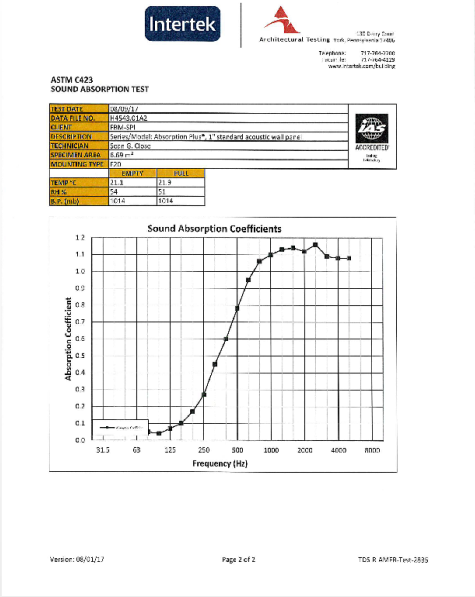
Other Factors That Can Impact Panel Acoustic Performance

- To prevent potential fabric sagging issues, many Specifiers call out that panel fabric be fully bonded.
- Accordingly panel manufacturers apply full face bonding adhesive.
- The type of adhesive used, application method, etc. can impact core panel porosity and therefore may impact sound absorption.
- Panels must be tested in the as built condition.
- **Critical Importance:** Building **CODE** requires exposed Thermal and Acoustic Insulation materials to be Class A rated per ASTM E84 for Flame Spread and Smoke Development.
- The fiberglass insulation core, fabric, potential impact layer, and adhesive control the finished panel performance for Flame Spread and Smoke Development. This performance data is critical for CODE compliance and more importantly occupant life safety.

Refer to the Acoustic Panel Fire Performance file for additional details

Request a Copy of The Test Report If,

- A panel manufacturer's acoustic data is significantly different than other industry providers for similar products tested with the same mounting method.
- Reported acoustic data does not include the mounting method used. It is important that the as tested mounting matches the project conditions otherwise actual project performance will be unreliable.
- Test data does not reference an Accredited Acoustic Test Laboratory.
- CAUTION: Designing project performance with test data generated via a mounting method that doesn't match actual installation conditions can yield disappointing performance.


Intertek

Architectural Testing

ASTM C423
SOUND ABSORPTION TEST

TEST DATE	08/01/17
DATA FILE NO.	H4563.01A2
CLIENT	PRM-SPI
DESCRIPTION	Series/Model: Absorption Plus®, 1" standard acoustic wall panel
TECHNICIAN	Scott G. Close
SPECIMEN AREA	5.69 m²
MOUNTING TYPE	E795

	EMPTY	FULL
TEMP °C	21.3	21.9
RH %	54	51
B.P. (hPa)	1014	1014

Sound Absorption Coefficients

Absorption Coefficient

Frequency (Hz)

Version: 08/01/17 Page 2 of 2 TDS R AMTR-Test-2835

SPI Absorption Plus® panels have been tested at an accredited laboratory to ASTM C423 and ASTM E795 Type A Mounting Method.

QUESTIONS?

Call (855) 519-4044

Or

Fabteam@spi-co.com