

**ASTM C 423 SOUND ABSORPTION
TEST REPORT**

Rendered to:

FABRI TRAK SYSTEMS, INC.

SERIES/MODEL: 1-1/4" Fabri Tack™

TYPE: 1/4" High Density Board with 1" Fiberglass

| Summary of Test Results | | | | | | | | |
|---|--|------|------|------|------|------|------|------|
| Sample ID Number & Sample Description | 1/3 Octave Sound Absorption Coefficients at the Octave Band Frequencies | | | | | | NRC | SAA |
| | 125 | 250 | 500 | 1000 | 2000 | 4000 | | |
| C5045.02B Series/Model 1-1/4" Fabri Tack™, 1/4" high density board with 1" fiberglass | 0.18 | 0.62 | 0.96 | 1.02 | 0.92 | 0.97 | 0.90 | 0.87 |

Reference should be made to Architectural Testing, Inc. Report No. C5045.02-113-11 for complete test specimen description. The complete test results are listed in Appendix B.

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

FABRI TRAK SYSTEMS, INC.
111 West Park Drive
Mt. Laurel, New Jersey 08054

Report No: C5045.02-113-11
Test Date: 02/04/13
Report Date: 03/13/13
Record Retention End Date: 03/13/17

Test Sample Identification:

Series/Model: 1-1/4" Fabri Tack™

Type: 1/4" High Density Board with 1" Fiberglass

Overall Size: 2.44 m by 2.74 m (8' by 9')

Project Summary: Architectural Testing, Inc. was contracted by Fabri Trak Systems, Inc. to conduct a sound absorption test on a Series/Model 1-1/4" Fabri Tack™, 1/4" high density board with 1" fiberglass. A summary of the results is listed in the Test Results section, and the complete test data is included as Appendix B of this report. The sample was provided by the client.

Test Methods: The acoustical test was conducted in accordance with the following:

ASTM C 423-09a, *Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.*

ASTM E 795-05 (2012), *Standard Practices for Mounting Test Specimens During Sound Absorption Tests.*

Test Equipment: The equipment used to conduct these tests meets the requirements of ASTM C 423. The microphone was calibrated before conducting the sound absorption test. The test equipment and test chamber descriptions are listed in Appendix A.

Test Procedure: The sound absorption of the reverberation chamber was measured before the test specimen was installed. This measurement shall be referred to as the empty room test. For the Type A mounting, the test specimen was placed directly against the test surface (floor) of the reverberation room with the high density board exposed to the sound field. The perimeter of the sample was sealed to the floor with aluminum angle and duct tape. The sound absorption test was then re-run. The absorption measurement with the specimen inside the chamber shall be referred to as the full room test.

For the empty and full room tests, ten decay measurements were conducted at each of the five microphone positions. The sound absorption test was conducted at 1/3 octave band frequencies ranging from 80 to 5000 hertz. The air temperature and relative humidity conditions were monitored and recorded during the empty and full room measurements.

The Sound Absorption Coefficient is the full room absorption minus the empty room absorption divided by the area of the sample in m². The Sound Absorption Coefficient is dimensionless.

The Noise Reduction Coefficient (NRC) rating is the arithmetic average of the sound absorption coefficients at 250, 500, 1000 and 2000 hertz. The average is rounded to the nearest multiple of 0.05.

The Sound Absorption Average (SAA) rating is the arithmetic average of the sound absorption coefficients at the frequencies ranging from 200 to 2500 hertz. The average is rounded to the nearest multiple of 0.01.

Sample Description:

| Material Description | Average Thickness | |
|---------------------------|-------------------|--------|
| 14-18# High density board | 6.35 mm | 0.250" |
| Fiberglass 6 pcf | 25.40 mm | 1.000" |

Note: The test specimen consisted of 6.35 mm (1/4") thick 14-18# high density board and 25.4 mm (1") thick 6 pcf fiberglass that was laminated together to produce a 31.75 mm (1-1/4") thick specimen.

The test specimen consisted of four, 1.22 m by 1.37 m (48" by 54") panels, which were arranged to produce a 2.44 m by 2.74 m (8' by 9') test specimen. The total weight of the sample was approximately 26.54 kg (58.5 lbs). The sample test setup was photographed with a digital camera, and a picture is included in Appendix C.

Comments: The client did not supply drawings on the Series/Model 1-1/4" Fabri Tack™, 1/4" high density board with 1" fiberglass. The test specimen was returned per the client's request.

Test Results: A summary of the sound absorption tests is listed below:

| Summary of Test Results | | | | | | | | |
|---|---|------|------|------|------|------|------|------|
| Sample ID Number & Sample Description | 1/3 Octave Sound Absorption Coefficients at the Octave Band Frequencies | | | | | | NRC | SAA |
| | 125 | 250 | 500 | 1000 | 2000 | 4000 | | |
| C5045.02B Series/Model 1-1/4" Fabri Tack™, 1/4" high density board with 1" fiberglass | 0.18 | 0.62 | 0.96 | 1.02 | 0.92 | 0.97 | 0.90 | 0.87 |

The complete test results are listed in Appendix B. The acoustical chamber is qualified down to 80 hertz. Data provided below this frequency is for reference only.

Architectural Testing will service this report for the entire test record retention period. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained by Architectural Testing for the entire test record retention period.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing.

For ARCHITECTURAL TESTING, INC:

Daniel P. Platts
Technician - Acoustical Testing

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

DPP:jmcs

Attachments (pages): This report is complete only when all attachments listed are included.

- Appendix-A: Equipment description (1)
- Appendix-B: Complete test results (2)
- Appendix-C: Photograph (1)

Revision Log

| <u>Rev. #</u> | <u>Date</u> | <u>Page(s)</u> | <u>Revision(s)</u> |
|---------------|-------------|----------------|-----------------------|
| 0 | 03/13/13 | N/A | Original Report Issue |

Appendix A

Instrumentation:

| Instrument | Manufacturer | Model | Description | ATI Number | Date of Calibration |
|--------------------------------------|-------------------|---------------------|---------------------------------|--------------------|---------------------|
| Analyzer | Hewlett Packard | HP35670A | Real time analyzer | 004112 | 07/11 * |
| Data Acquisition Unit | Agilent | 34970A | Data Acquisition Unit | 62211 | 07/12 |
| Receive Room Microphone | GRAS | 40 AR | 1/2" Microphone | Y003246 | 08/12 |
| Receive Room Preamplifier | GRAS | 26 AK | 1/2" Preamplifier | Y003249 | 08/12 |
| Microphone Calibrator | Bruel & Kjaer | Type 4228 | Pistonphone Calibrator | Y002816 | 02/12 |
| Noise Source | Delta Electronics | SNG-1 | Noise Generator | Y002181 | N/A |
| Equalizer | Rane | RPE 228 | Programmable Equalizer | Y002180 | N/A |
| Power Amplifiers | Crown | Xti 2000 | Two, Amplifiers | 005769 005770 | N/A |
| Receive Room Loudspeakers | Renkus-Heinz Inc. | Trap Jr./9 | Two, Loudspeakers | Y001784 Y001785 | N/A |
| Receive Room Environmental Indicator | Vaisala | HMW60Y | Temperature and Humidity Sensor | 005066 | 09/12 |
| Weather Station | Davis Instruments | VantagePRO 6150C | Weather Station | Y003257 | 05/12 |

*- Note: The calibration frequency for this equipment is every two years per the manufacturer's recommendation.

Test Chamber:

| | Volume | Description |
|--------------|--|---|
| Receive Room | 234 m ³ (8291.3 ft ³) | Rotating vane and stationary diffusers Temperature and humidity controlled Isolation pads under the floor |

N/A-Non Applicable

Appendix B
Complete Test Results

SOUND ABSORPTION
ASTM C 423

| | | |
|----------------------|--|------|
| Test Date | 02/04/13 | |
| ATI No. | C5045.02B | |
| Client | Fabri Trak Systems, Inc. | |
| Specimen | Series/Model: 1-1/4" Fabri Tack™, 1/4" high density board with 1" fiberglass | |
| Operator | Daniel P. Platts | |
| Sample Area | 6.69 m ² | |
| Mounting Type | Type A | |
| | Empty | Full |
| Temp C | 22 | 22 |
| RH % | 50 | 49 |
| B.P. (mb) | 1004 | |

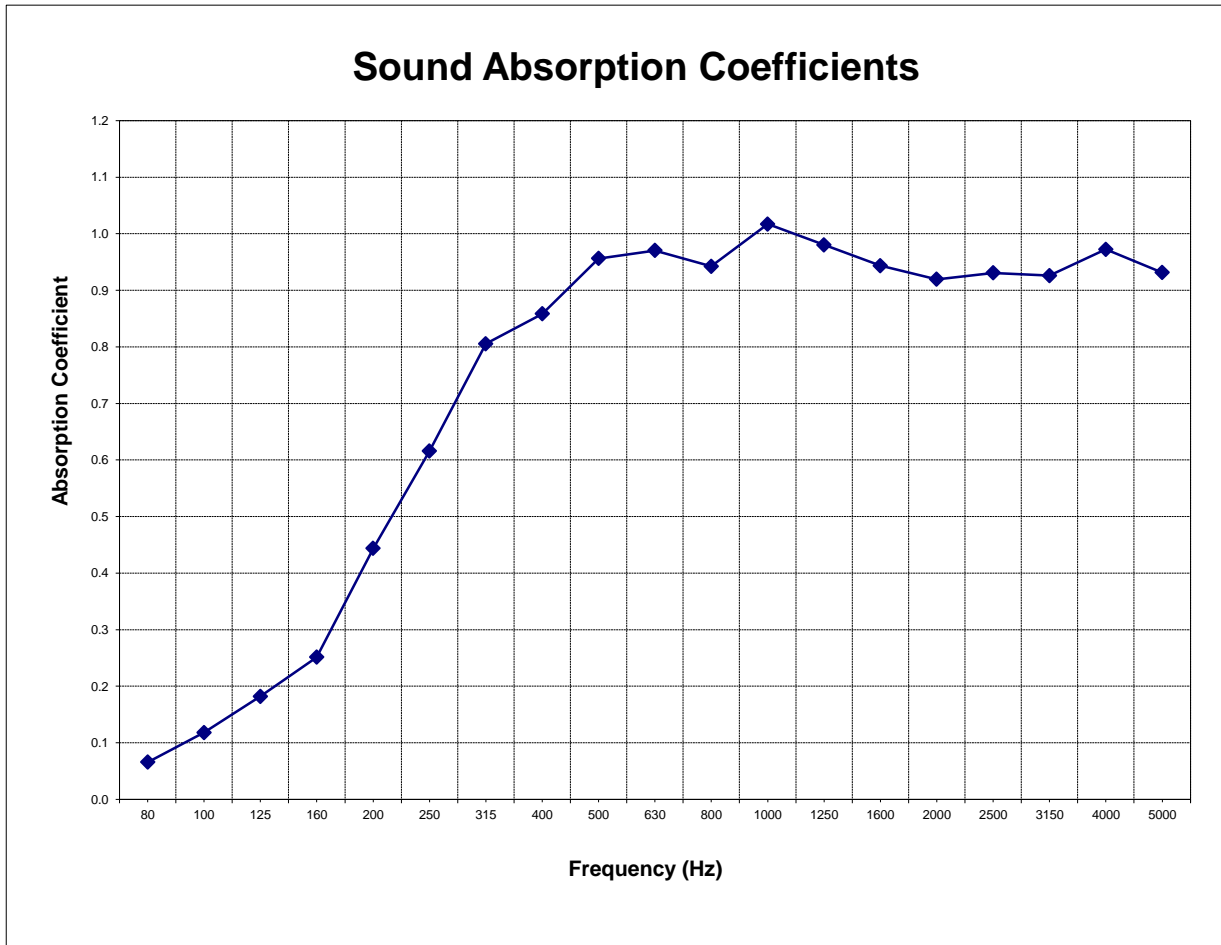
| Freq (Hz) | Empty Room Absorption (m ²) | Uncertainty | Full Room Absorption (m ²) | Uncertainty | Absorption Coefficient | Relative Uncertainty |
|-----------|---|-------------|--|-------------|------------------------|----------------------|
| 80 | 5.02 | 0.061 | 5.46 | 0.156 | 0.07 | 0.025 |
| 100 | 5.55 | 0.008 | 6.34 | 0.111 | 0.12 | 0.017 |
| 125 | 4.80 | 0.023 | 6.02 | 0.073 | 0.18 | 0.011 |
| 160 | 4.38 | 0.000 | 6.06 | 0.030 | 0.25 | 0.005 |
| 200 | 4.10 | 0.036 | 7.07 | 0.049 | 0.44 | 0.009 |
| 250 | 4.63 | 0.008 | 8.75 | 0.013 | 0.62 | 0.002 |
| 315 | 4.83 | 0.012 | 10.21 | 0.031 | 0.81 | 0.005 |
| 400 | 5.01 | 0.014 | 10.75 | 0.026 | 0.86 | 0.004 |
| 500 | 5.04 | 0.000 | 11.44 | 0.053 | 0.96 | 0.008 |
| 630 | 4.82 | 0.013 | 11.32 | 0.030 | 0.97 | 0.005 |
| 800 | 4.85 | 0.009 | 11.15 | 0.011 | 0.94 | 0.002 |
| 1000 | 4.73 | 0.014 | 11.54 | 0.026 | 1.02 | 0.004 |
| 1250 | 5.19 | 0.008 | 11.75 | 0.011 | 0.98 | 0.002 |
| 1600 | 5.15 | 0.002 | 11.46 | 0.030 | 0.94 | 0.004 |
| 2000 | 5.07 | 0.008 | 11.22 | 0.017 | 0.92 | 0.003 |
| 2500 | 5.25 | 0.003 | 11.48 | 0.013 | 0.93 | 0.002 |
| 3150 | 5.44 | 0.008 | 11.64 | 0.021 | 0.93 | 0.003 |
| 4000 | 5.30 | 0.003 | 11.81 | 0.009 | 0.97 | 0.001 |
| 5000 | 5.65 | 0.005 | 11.88 | 0.022 | 0.93 | 0.003 |

NRC Rating **0.90** *(Noise Reduction Coefficient)*
SAA Rating **0.87** *(Sound Absorption Average)*

- Notes:
- 1) The NRC rating is the arithmetic average of the sound absorption coefficients at 250, 500, 1000, and 2000 hertz. The average is rounded to the nearest multiple of 0.05.
 - 2) The SAA rating is the arithmetic average of the sound absorption coefficients at the frequencies ranging from 200 to 2500 hertz. The average is rounded to the nearest multiple of 0.01.

SOUND ABSORPTION
ASTM C 423

| | | |
|----------------------|--|------|
| Test Date | 02/04/13 | |
| ATI No. | C5045.02B | |
| Client | Fabri Trak Systems, Inc. | |
| Specimen | Series/Model: 1-1/4" Fabri Tack™, 1/4" high density board with 1" fiberglass | |
| Operator | Daniel P. Platts | |
| Sample Area | 6.69 m ² | |
| Mounting Type | Type A | |
| | Empty | Full |
| Temp C | 21.9 | 22.0 |
| RH % | 50 | 49 |
| B.P. (mb) | 1004 | |



Appendix C

Photograph



View of Installed Specimen