

# ADAPT ACOUSTICAL PERFORMANCE TEST REPORT

**SCOPE OF WORK**

ASTM C423 SOUND ABSORPTION TESTING ON A  
BTW (BETTER THAN WOOD) CEILING SYSTEM, CEILING TILES

**REPORT NUMBER**

J7487.02-113-11-R0

**TEST DATE**

06/07/19

**ISSUE DATE**

06/19/19

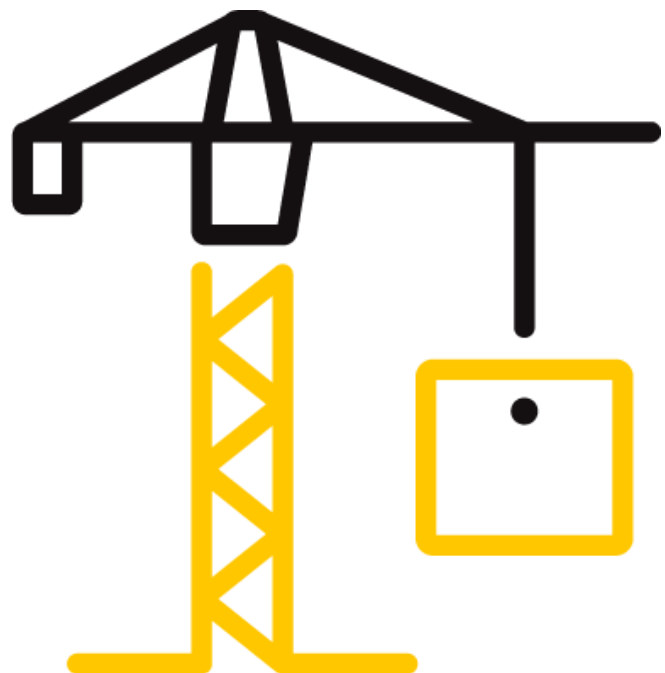
**PAGES**

10

**DOCUMENT CONTROL NUMBER**

RT-R-AMER-Test-2755 (01/24/19)

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## TEST REPORT FOR ADAPT

Report No.: J7487.02-113-11-R0

Date: 06/19/19

### REPORT ISSUED TO

#### ADAPT

17650 East 32nd Place, Suite 10b  
Aurora, Colorado

### SECTION 1

#### SCOPE

Intertek Building & Construction (B&C) was contracted to perform a sound absorption test. This report is a reissue of the original Report No. J7487.01-113-11. This report is reissued in the name of Adapt through written authorization from the original client. Results obtained are tested values and were secured by using the designated test methods. The complete test data is included herein. The original client provided the test specimen. All measurements were conducted in the HT test chambers at Intertek B&C located in York, Pennsylvania.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. Intertek B&C will service this report for the entire test record retention period. The test record retention period ends four years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained for the entire test record retention period.

For INTERTEK B&C:

<b>COMPLETED BY:</b>	Zachary P. Golden	<b>REVIEWED BY:</b>	Kurt A. Golden
<b>TITLE:</b>	Technician Team Leader Acoustical Testing	<b>TITLE:</b>	Project Lead Acoustical Testing
<b>SIGNATURE:</b>		<b>SIGNATURE:</b>	
<b>DATE:</b>	06/19/19	<b>DATE:</b>	06/19/19

ZPG:jmcs

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**SECTION 2**

**SUMMARY OF TEST RESULTS**

<b>SERIES/MODEL</b>	BTW (Better than Wood) Ceiling System							
<b>SAMPLE TYPE</b>	Ceiling tiles							
<b>MOUNTING TYPE</b>	E-400							
<b>DATA FILE NO.</b>	<b>1/3 OCTAVE SOUND ABSORPTION COEFFICIENTS AT THE OCTAVE BAND FREQUENCIES</b>						<b>NRC</b>	<b>SAA</b>
	<b>125</b>	<b>250</b>	<b>500</b>	<b>1000</b>	<b>2000</b>	<b>4000</b>		
J7487.01	0.54	0.33	0.25	0.23	0.32	0.16	0.30	0.28

**SECTION 3**

**TEST METHODS**

The specimens were evaluated in accordance with the following:

*ASTM C423-17, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method*

*ASTM E795-16, Standard Practices for Mounting Test Specimens During Sound Absorption Tests*

**SECTION 4**

**SPECIMEN MOUNTING**

For the Type E-400 mounting, the specimen was placed on the Type E test assembly so that the absorptive face of specimen was suspended 400 mm above the floor of the reverberation room. The perimeter of the specimen was sealed to the test assembly with duct tape. The perimeter of the test assembly was sealed to the floor with duct tape.

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### SECTION 5 EQUIPMENT

The equipment listed below meets the requirements of the test methods stated in Section 3 of this report.

INSTRUMENT	MANUFACTURER	MODEL	DESCRIPTION	ASSET #	CAL DATE
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	65125*	05/18
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	65126*	05/18
Data Acquisition Card	National Instruments	PXI-4462	Data Acquisition Card	63763-3*	04/18
Receive Room Microphone	PBC Piezotronics	378B20	Microphone and Preamplifier	64907	12/18
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64908	12/18
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64909	12/18
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64910	12/18
Receive Room Microphone	PCB Piezotronics	378B20	Microphone and Preamplifier	64911	01/19
Receive Room Environmental Indicator	Comet	T7510	Receive Room	64915	01/19
Microphone Calibrator	Norsonic	1251	Acoustical Calibrator	Y002919	04/19

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

### TEST CHAMBER

	VOLUME	DESCRIPTION
RECEIVE ROOM	234 m <sup>3</sup>	Rotating vane and stationary diffusers Temperature and humidity controlled Isolation pads under the floor

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### SECTION 6

#### LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Zachary P. Golden	Intertek B&C
Andrew M. Johnston	Intertek B&C

### SECTION 7

#### TEST PROCEDURE

The sensitivity of the microphones was checked before measurements were conducted. Empty room sound absorption measurements were conducted before the specimen was installed. Full room sound absorption measurements were conducted after the specimen was installed.

For the empty and full room measurements, ten decay measurements were conducted at each of the five microphone positions. Data was obtained 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 measurements.

Intertek B&C will store samples of test specimens for four years.

### SECTION 8

#### TEST CALCULATIONS

The Sound Absorption Coefficient is the full room absorption minus the empty room absorption divided by the area of the sample in m<sup>2</sup>. 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.

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**SECTION 9**

**TEST SPECIMEN DESCRIPTION**

<b>SERIES/MODEL</b>	BTW (Better than Wood) Ceiling System
<b>SAMPLE TYPE</b>	Ceiling tiles
<b>MOUNTING TYPE</b>	E-400

Twenty-six panels were arranged to produce the 2.44 m by 2.74 m (96" by 108") test specimen. A full size panel measured 2.20 m (86-1/2") by 0.20 m (7-7/8") by 0.01 m (1/2"). The total weight of the specimen was 24.04 kg (53 lbs).

<b>DESCRIPTION</b>	<b>THICKNESS</b>	<b>DENSITY*</b>
Vinyl wrap	0.30 mm 0.012"	N/A
Polyester	12.40 mm 0.488"	3.00 kg/m <sup>3</sup> 0.187 lbs/ft <sup>3</sup>

\* - Stated per Client/Manufacturer

Photographs are included in Section 11.

The client did not supply a report drawing of the test specimen.

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### SECTION 10

#### TEST RESULTS

##### J7487.01 DATA

<b>TECHNICIAN</b>	Zachary Golden	
<b>SPECIMEN AREA</b>	6.69 m <sup>2</sup>	
<b>MOUNTING TYPE</b>	E400	
	<b>EMPTY</b>	<b>FULL</b>
<b>TEMP °C</b>	21.8	21.3
<b>RH %</b>	48	47
<b>B.P. (mb)</b>	983	984

FREQ (Hz)	EMPTY ROOM ABSORPTION (m <sup>2</sup> )	UNCERTAINTY	FULL ROOM ABSORPTION (m <sup>2</sup> )	UNCERTAINTY	ABSORPTION COEFFICIENT	RELATIVE UNCERTAINTY
80	5.28	0.432	7.87	0.720	0.39	0.125
100	5.53	0.545	8.50	0.414	0.44	0.102
125	5.76	0.465	9.39	0.294	0.54	0.082
160	5.02	0.159	7.37	0.083	0.35	0.027
200	4.74	0.097	7.05	0.043	0.35	0.016
250	5.05	0.065	7.23	0.033	0.33	0.011
315	5.25	0.068	7.22	0.066	0.29	0.014
400	5.39	0.062	7.12	0.027	0.26	0.010
500	5.53	0.043	7.21	0.072	0.25	0.013
630	5.06	0.039	6.78	0.008	0.26	0.006
800	5.14	0.023	6.74	0.027	0.24	0.005
1000	5.17	0.020	6.72	0.031	0.23	0.006
1250	5.45	0.013	7.09	0.017	0.24	0.003
1600	5.47	0.007	7.39	0.012	0.29	0.002
2000	5.43	0.022	7.54	0.161	0.32	0.024
2500	5.70	0.006	7.53	0.168	0.27	0.025
3150	6.02	0.006	7.24	0.007	0.18	0.001
4000	6.58	0.005	7.62	0.005	0.16	0.001
5000	7.14	0.005	8.23	0.006	0.16	0.001

<b>NRC RATING</b>	0.30	<i>(Noise Reduction Coefficient)</i>
<b>SAA RATING</b>	0.28	<i>(Sound Absorption Average)</i>

Notes:

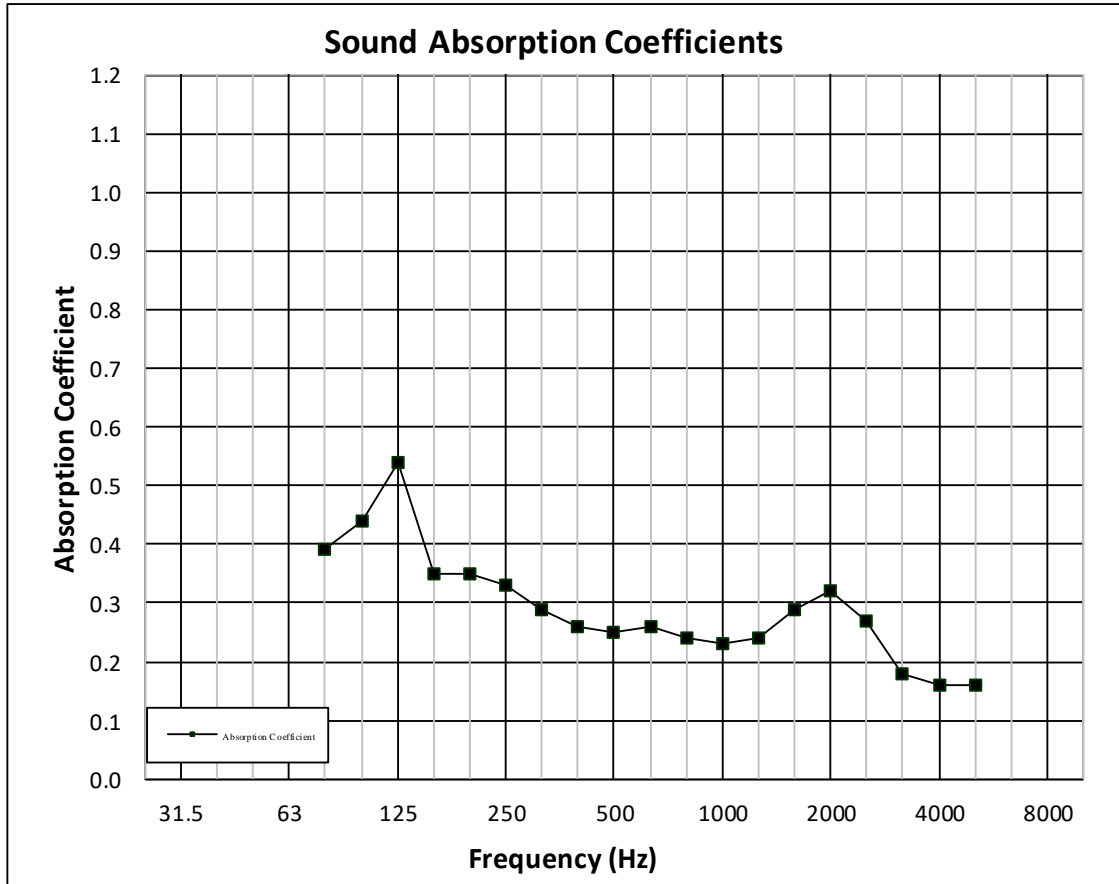
- 1) The NRC rating is the arithmetic average of the sound absorption coefficients at 250, 500, 1000, and 2000 hertz. The average is rounded to the nearest multiple of 0.05.
- 2) The SAA rating is the arithmetic average of the sound absorption coefficients at the frequencies ranging from 200 to 2500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

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### J7487.01 GRAPH





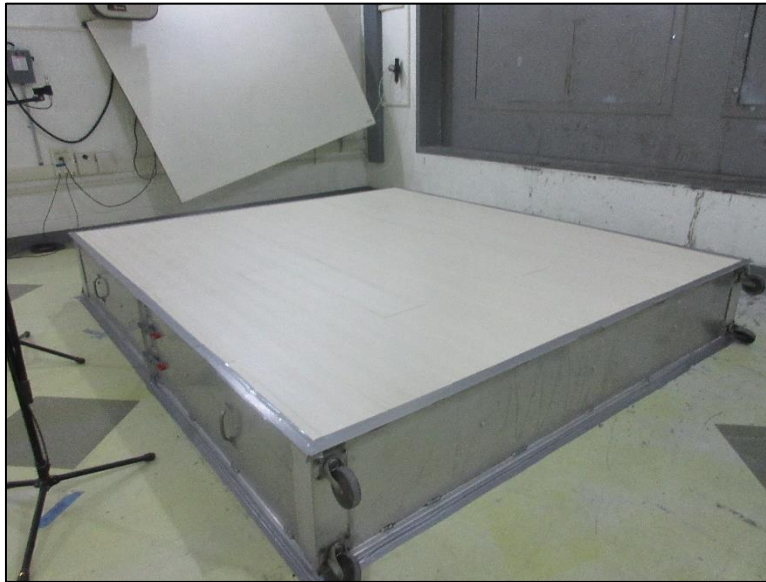
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### SECTION 11

#### PHOTOGRAPHS



**Photo No. 1**  
**View of Installed Test Specimen**



**Photo No. 1**  
**Side View of Test Specimen**



Total Quality. Assured.

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**SECTION 12**

**REVISION LOG**

REVISION #	DATE	PAGES	REVISION
0	06/19/19	N/A	Original Report Issue – Reissue of Report No. J7487.01-113-11 in the name of Adapt