



**Acoustic and Insulation
Product Testing Laboratories**

2790 Columbus Road, Granville, OH 43023

CLIENT: **Jeff Williams**
Bouckaert Industrial Textiles
71 Indian Trail
Lake Orion, MI 48360

REPORT NO. A190033
Proposal No. A19011
Date: 16 October 2019

TITLE: Sound Absorption Testing per ASTM C423-17 and E795-16.

Purpose

The purpose of this testing is to determine the sound absorptive properties of the submitted sample.

Samples Submitted

The test material description as provided by the client is as follows:

- 1) Poly-Sonic 45 (BIT Part #: PE-TH-F-45354-72X48 LT SMOKE)
- 2) Poly-Sonic 56 (BIT Part #: PE-TH-F-56550-72X48 SMOKE)
- 3) Poly-Sonic 110 (BIT Part #: PE-TH-F-1101000-72x48 Lt Smoke)
- 4) Poly-Sonic 144 (BIT Part #: PE-TH-F-1442000-72x48 Dk Smoke)

Testing Method

All samples were placed in the designated ASTM C423 position within the 286.36 cubic meter reverberation chamber. All samples were mounted in accordance with ASTM E795 Type A Mount requirements.

The test method conformed explicitly to the requirements of the ASTM Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method: ASTM C423-17 and E795-16. The Owens Corning Test Method M-01Aa conforms explicitly to ASTM and NVLAP requirements and describes in detail the method used by this lab in conducting sound absorption tests. A description of the measuring technique is available separately. Details pertaining to Reverberation Suite 1 are available upon request.

Accuracy and Accreditation

Owens Corning Acoustic and Insulation Product Testing Laboratories is accredited through the National Voluntary Laboratory Accreditation Program (NVLAP Lab Code 100109-0) for this test procedure. The percentage of uncertainty for the required 95% confidence limits is outlined per frequency band in section



This laboratory (NVLAP Lab Code 100109-0) is accredited by NVLAP of the National Institute of Standards and Technology for specified tests in accordance with prescribed test methods and accreditation criteria. The NVLAP logo and/or this report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government for the product tests referenced herein.

The information provided herein is based on controlled laboratory conditions. The test specimen identification is as provided by the client and Owens Corning Acoustic and Insulation Product Testing Laboratories accepts no responsibility for any inaccuracies therein. Owens Corning Acoustic and Insulation Product Testing Laboratories makes no warranty that the results provided herein are representative of actual use conditions. Each user should independently evaluate the data provided and make their own decision as to whether the data is reliable and representative for their service conditions.

Owens Corning Acoustic and Insulation Product Testing Laboratories authorizes the client named herein to reproduce this report only in its entirety. Testing results apply only to material specimens evaluated within this report.

13 of the ASTM Standard Test Method for Sound Absorption Coefficients by the Reverberation Room Method: ASTM C423-17. Tables 1 and 2 show the reproducibility (R) and repeatability (r) of an inter-laboratory comparison beginning in 2001.

Summary of Results



A



B

- 1) Figure 1. Pictures A and B show photographs of Poly-Sonic 45 (BIT Part #: PE-TH-F-45354-72X48 LT SMOKE) in the receive room of Reverberation Suite 1 sealed with an aluminum frame.

Summations and details of the test(s) and test results are provided on the attached data sheet(s).

Yahya Paya
Associate Engineer, Acoustic Research Center
Owens Corning Acoustic and Insulation Product
Testing Laboratories

Corey A. Taylor
Engineer R&D, Acoustic Research Center
Owens Corning Acoustic and Insulation
Product Testing Laboratories



**Acoustic and Insulation
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Test Number A190033_1_191010_C423

ASTM C423 Sound Absorption

Brief Description: Poly-Sonic 45 (BIT Part #: PE-TH-F-45354-72X48 LT SMOKE)	
Full Room Date: 10/10/2019	Empty Room Date: 10/10/2019
Test Request: A190033	Tested By: Really Rine
Measurement Procedure: Averaging algorithm is exponential	

Test Method: The sample was tested in compliance with ASTM C423 and ASTM E795 Type A - Surface Mounted

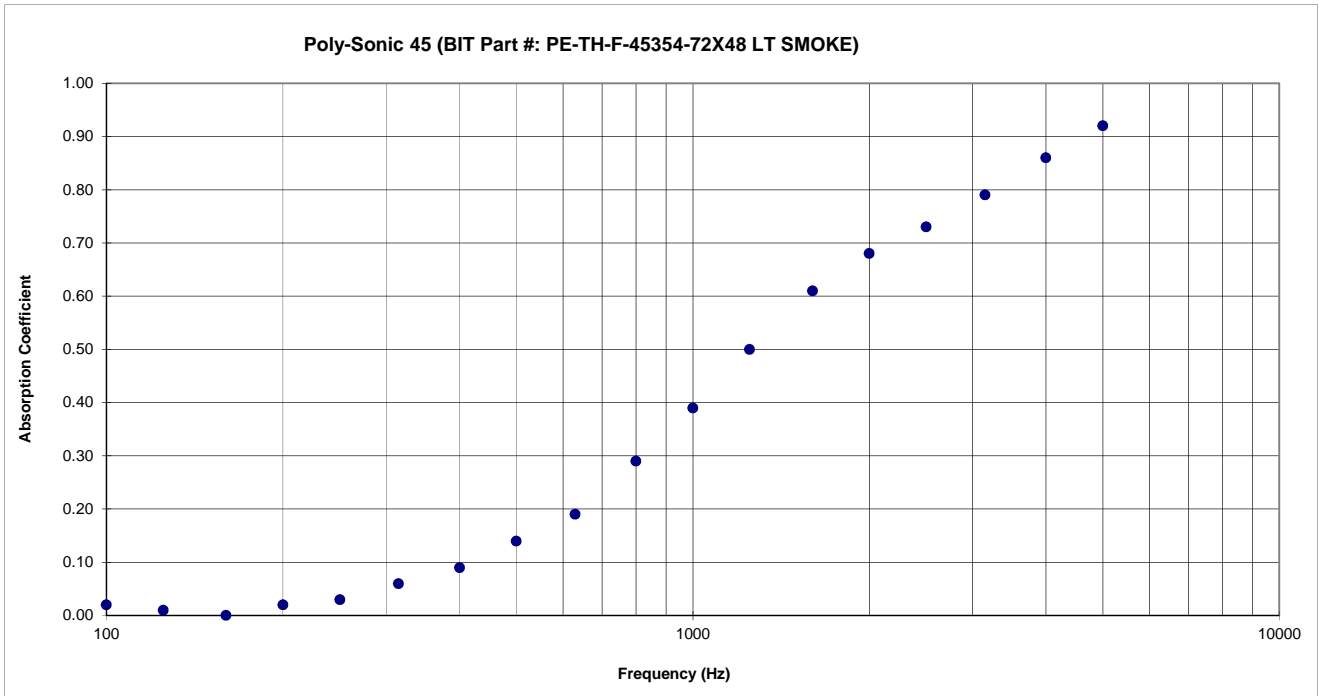
Test System: Bruel & Kjaer Type LAN-XI 3160-A-042 SN: 105319 and 105457
Sound Source: Bruel & Kjaer Generator Module Type 3160-A-042. Creating broad band pink noise.
Location: Acoustics Lab B75 **Date:** 10/10/2019

Summary of Test Results :

Frequency (Hz)	Absorption Coefficient	Absorption (Metric Sabins)	Absorption (Standard Sabins)
100	0.02	0.17	1.81
125	0.01	0.06	0.68
160	0.00	0.02	0.21
200	0.02	0.11	1.19
250	0.03	0.21	2.23
315	0.06	0.41	4.47
400	0.09	0.58	6.22
500	0.14	0.96	10.34
630	0.19	1.31	14.11
800	0.29	1.94	20.93
1000	0.39	2.66	28.62
1250	0.50	3.37	36.26
1600	0.61	4.09	44.00
2000	0.68	4.57	49.15
2500	0.73	4.92	52.97
3150	0.79	5.29	56.94
4000	0.86	5.78	62.24
5000	0.92	6.21	66.86

	Empty Room	Full Room
Temperature (deg. C):	21.80	21.90
% Relative Humidity:	47.40	46.80
Date:	10/10/2019	10/10/2019
Atmospheric Pressure (kPa):	98.4	

NRC	0.30
SAA	0.31





**Acoustic and Insulation
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Test Number A190033_1_191010_C423

ASTM C423 Sound Absorption

Full Description:	Tested By:	Really Rine	
Weight (kg):	9.32	Weight (lb):	20.55
Area (sq. m):	6.73	Area (sq. ft.):	72.50
Mounting:	Type A - Surface Mounted		
Other Information:			

The purpose of this testing is to determine the sound absorptive properties of the submitted sample.

The test material description, whether by observation or as provided by the client, is as follows:
Poly-Sonic 45 (BIT Part #: PE-TH-F-45354-72X48 LT SMOKE)

Each panel was characterized/measured in the Owens Corning Acoustic Research Center
by Really Rine on October 09, 2019.

These measurements are documented below.

All measurements and calculations were conducted in accordance with Owens Corning Test Method(s):

W-01Ca, Density and Square Foot Weight
D01-Bg, Thickness of Insulation Board Products

A NIST traceable tape measure was used to obtain the lengths and widths of each panel. The lengths provided here are an average of 3 measurements, and the widths are an average of 3 measurements per panel. Per D-01Ae, the thickness measurements are an average of 3 measurements per panel.

The sum total area of the sample was 72.50 square feet.

Length (in.)	Width (in.)	Thickness (in.)	Weight (lbs.)	Density (pcf)	Area wt.(psf)
108.27	96.42	0.34	20.55	9.89	0.28

The sum total area of the sample was 6.73 square meters.

Length (m)	Width (m)	Thickness (mm)	Weight (kg)	Density (kg/m ³)	Area wt. (kg/m ²)
2.75	2.45	8.74	9.32	158.37	1.38

Individual panel data are available upon request.

All calculations and physical measurements include all components associated with this sample, unless otherwise noted.

The sample was given 24 hours to come to equilibrium with the atmospheric conditions of the test chamber.

The perimeter edge of the sample was sealed with an aluminum frame.

The facing side of the sample was exposed to the sound field.

The sample was placed in the designated ASTM C423 position within the 286.36 cu. m (10,110 cu. ft.) reverberation chamber.

Details of this position may be obtained by request.

All ASTM E795 mounting requirements were met for this test.

The source speakers were located in positions 1 and 2 (standard locations) within the reverberation chamber.

Details of this position may be obtained by request.



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Test Number A190033_2_191010_C423

ASTM C423 Sound Absorption

Brief Description: Poly-Sonic 56 (BIT Part #: PE-TH-F-56550-72X48 SMOKE)	
Full Room Date: 10/10/2019	Empty Room Date: 10/10/2019
Test Request: A190033	Tested By: Really Rine
Measurement Procedure: Averaging algorithm is exponential	

Test Method: The sample was tested in compliance with ASTM C423 and ASTM E795 Type A - Surface Mounted

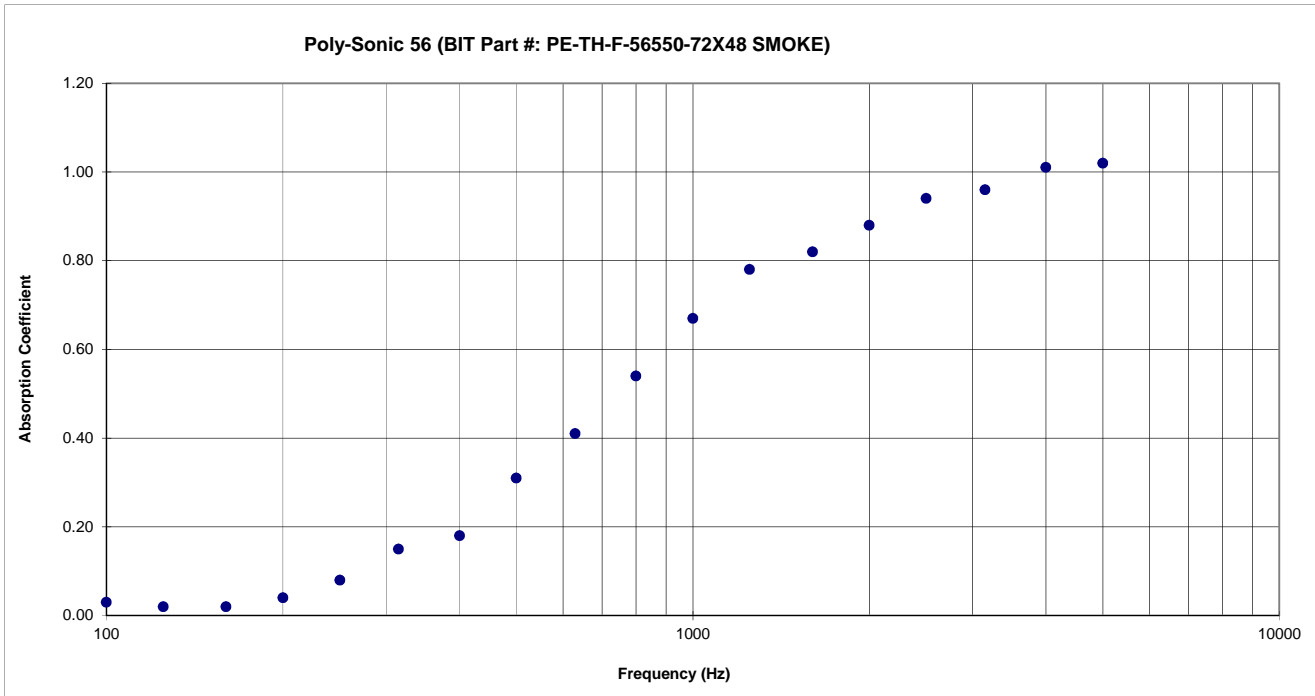
Test System: Bruel & Kjaer Type LAN-XI 3160-A-042 SN: 105319 and 105457
Sound Source: Bruel & Kjaer Generator Module Type 3160-A-042. Creating broad band pink noise.
Location: Acoustics Lab B75 **Date:** 10/10/2019

Summary of Test Results :

Frequency (Hz)	Absorption Coefficient	Absorption (Metric Sabins)	Absorption (Standard Sabins)
100	0.03	0.21	2.30
125	0.02	0.16	1.68
160	0.02	0.13	1.35
200	0.04	0.27	2.92
250	0.08	0.52	5.57
315	0.15	0.98	10.58
400	0.18	1.23	13.26
500	0.31	2.06	22.13
630	0.41	2.76	29.73
800	0.54	3.64	39.20
1000	0.67	4.50	48.43
1250	0.78	5.24	56.36
1600	0.82	5.54	59.67
2000	0.88	5.92	63.73
2500	0.94	6.30	67.81
3150	0.96	6.47	69.63
4000	1.01	6.78	73.02
5000	1.02	6.85	73.68

	Empty Room	Full Room
Temperature (deg. C):	21.80	21.90
% Relative Humidity:	47.40	47.00
Date:	10/10/2019	10/10/2019
Atmospheric Pressure (kPa):	98.4	

NRC	0.50
SAA	0.48





**Acoustic and Insulation
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Test Number A190033_2_191010_C423

ASTM C423 Sound Absorption

Full Description:	Tested By:	Really Rine	
Weight (kg):	12.55	Weight (lb):	27.67
Area (sq. m):	6.73	Area (sq. ft.):	72.48
Mounting:	Type A - Surface Mounted		
Other Information:			

The purpose of this testing is to determine the sound absorptive properties of the submitted sample.

The test material description, whether by observation or as provided by the client, is as follows:
Poly-Sonic 56 (BIT Part #: PE-TH-F-56550-72X48 SMOKE)

Each panel was characterized/measured in the Owens Corning Acoustic Research Center
by Really Rine on October 09, 2019.

These measurements are documented below.

All measurements and calculations were conducted in accordance with Owens Corning Test Method(s):

W-01Ca, Density and Square Foot Weight
D01-Bg, Thickness of Insulation Board Products

A NIST traceable tape measure was used to obtain the lengths and widths of each panel. The lengths provided here are an average of 3 measurements, and the widths are an average of 3 measurements per panel. Per D-01Ae, the thickness measurements are an average of 3 measurements per panel.

The sum total area of the sample was 72.48 square feet.

Length (in.)	Width (in.)	Thickness (in.)	Weight (lbs.)	Density (pcf)	Area wt.(psf)
108.28	96.39	0.55	27.67	8.38	0.38

The sum total area of the sample was 6.73 square meters.

Length (m)	Width (m)	Thickness (mm)	Weight (kg)	Density (kg/m ³)	Area wt. (kg/m ²)
2.75	2.45	13.89	12.55	134.16	1.86

Individual panel data are available upon request.

All calculations and physical measurements include all components associated with this sample, unless otherwise noted.

The sample was given 24 hours to come to equilibrium with the atmospheric conditions of the test chamber.

The perimeter edge of the sample was sealed with an aluminum frame.

The facing side of the sample was exposed to the sound field.

The sample was placed in the designated ASTM C423 position within the 286.36 cu. m (10,110 cu. ft.) reverberation chamber.

Details of this position may be obtained by request.

All ASTM E795 mounting requirements were met for this test.

The source speakers were located in positions 1 and 2 (standard locations) within the reverberation chamber.

Details of this position may be obtained by request.



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Test Number A190033_3_191010_C423

ASTM C423 Sound Absorption

Brief Description: Poly-Sonic 110 (BIT Part #: PE-TH-F-1101000-72x48 Lt Smoke)	
Full Room Date: 10/10/2019	Empty Room Date: 10/10/2019
Test Request: A190033	Tested By: Really Rine
Measurement Procedure: Averaging algorithm is exponential	

Test Method: The sample was tested in compliance with ASTM C423 and ASTM E795 Type A - Surface Mounted

Test System: Bruel & Kjaer Type LAN-XI 3160-A-042
Sound Source: Bruel & Kjaer Generator Module Type 3160-A-042.
 Creating broad band pink noise.

SN: 105319 and 105457

Location: Acoustics Lab B75

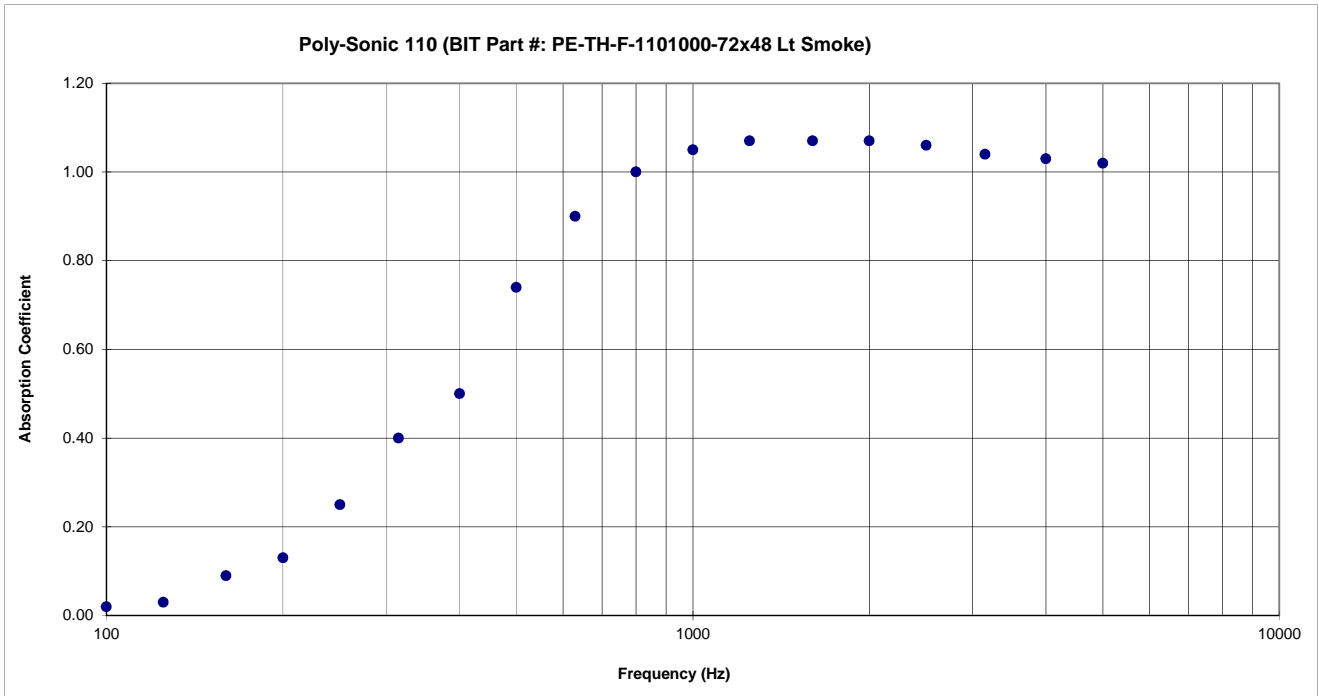
Date: 10/10/2019

Summary of Test Results :

Frequency (Hz)	Absorption Coefficient	Absorption (Metric Sabins)	Absorption (Standard Sabins)
100	0.02	0.11	1.19
125	0.03	0.22	2.39
160	0.09	0.61	6.55
200	0.13	0.88	9.44
250	0.25	1.68	18.03
315	0.40	2.65	28.50
400	0.50	3.36	36.21
500	0.74	4.97	53.51
630	0.90	6.05	65.09
800	1.00	6.66	71.65
1000	1.05	6.99	75.26
1250	1.07	7.17	77.12
1600	1.07	7.13	76.79
2000	1.07	7.17	77.22
2500	1.06	7.08	76.20
3150	1.04	6.97	75.03
4000	1.03	6.90	74.26
5000	1.02	6.85	73.76

	Empty Room	Full Room
Temperature (deg. C):	21.80	21.90
% Relative Humidity:	47.40	47.40
Date:	10/10/2019	10/10/2019
Atmospheric Pressure (kPa):	98.4	

NRC	0.80
SAA	0.77





**Acoustic and Insulation
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Test Number A190033_3_191010_C423

ASTM C423 Sound Absorption

Full Description:	Tested By:	Really Rine	
Weight (kg):	23.99	Weight (lb):	52.88
Area (sq. m):	6.69	Area (sq. ft.):	72.01
Mounting:	Type A - Surface Mounted		
Other Information:			

The purpose of this testing is to determine the sound absorptive properties of the submitted sample.

The test material description, whether by observation or as provided by the client, is as follows:
Poly-Sonic 110 (BIT Part #: PE-TH-F-1101000-72x48 Lt Smoke)

Each panel was characterized/measured in the Owens Corning Acoustic Research Center by Really Rine on October 09, 2019.

These measurements are documented below.
All measurements and calculations were conducted in accordance with Owens Corning Test Method(s):
W-01Ca, Density and Square Foot Weight
D01-Bg, Thickness of Insulation Board Products

A NIST traceable tape measure was used to obtain the lengths and widths of each panel. The lengths provided here are an average of 3 measurements, and the widths are an average of 3 measurements per panel. Per D-01Ae, the thickness measurements are an average of 3 measurements per panel.

The sum total area of the sample was 72.01 square feet.

Length (in.)	Width (in.)	Thickness (in.)	Weight (lbs.)	Density (pcf)	Area wt.(psf)
107.60	96.37	1.00	52.88	8.84	0.73

The sum total area of the sample was 6.69 square meters.

Length (m)	Width (m)	Thickness (mm)	Weight (kg)	Density (kg/m ³)	Area wt. (kg/m ²)
2.73	2.45	25.33	23.99	141.56	3.59

Individual panel data are available upon request.
All calculations and physical measurements include all components associated with this sample, unless otherwise noted.

The sample was given 24 hours to come to equilibrium with the atmospheric conditions of the test chamber.

The perimeter edge of the sample was sealed with an aluminum frame.
The facing side of the sample was exposed to the sound field.
The sample was placed in the designated ASTM C423 position within the 286.36 cu. m (10,110 cu. ft.) reverberation chamber. Details of this position may be obtained by request.
All ASTM E795 mounting requirements were met for this test.
The source speakers were located in positions 1 and 2 (standard locations) within the reverberation chamber. Details of this position may be obtained by request.



**Acoustic and Insulation
Product Testing Laboratories**

Test Number A190033_4_191015_C423

ASTM C423 Sound Absorption

Brief Description: Poly-Sonic 144 (BIT Part #: PE-TH-F-1442000-72x48 Dk Smoke)	
Full Room Date: 10/15/2019	Empty Room Date: 10/15/2019
Test Request: A190033	Tested By: Really Rine
Measurement Procedure: Averaging algorithm is exponential	

Test Method: The sample was tested in compliance with ASTM C423 and ASTM E795 Type A - Surface Mounted

Test System: Bruel & Kjaer Type LAN-XI 3160-A-042
Sound Source: Bruel & Kjaer Generator Module Type 3160-A-042.
 Creating broad band pink noise.

SN: 105319 and 105457

Location: Acoustics Lab B75

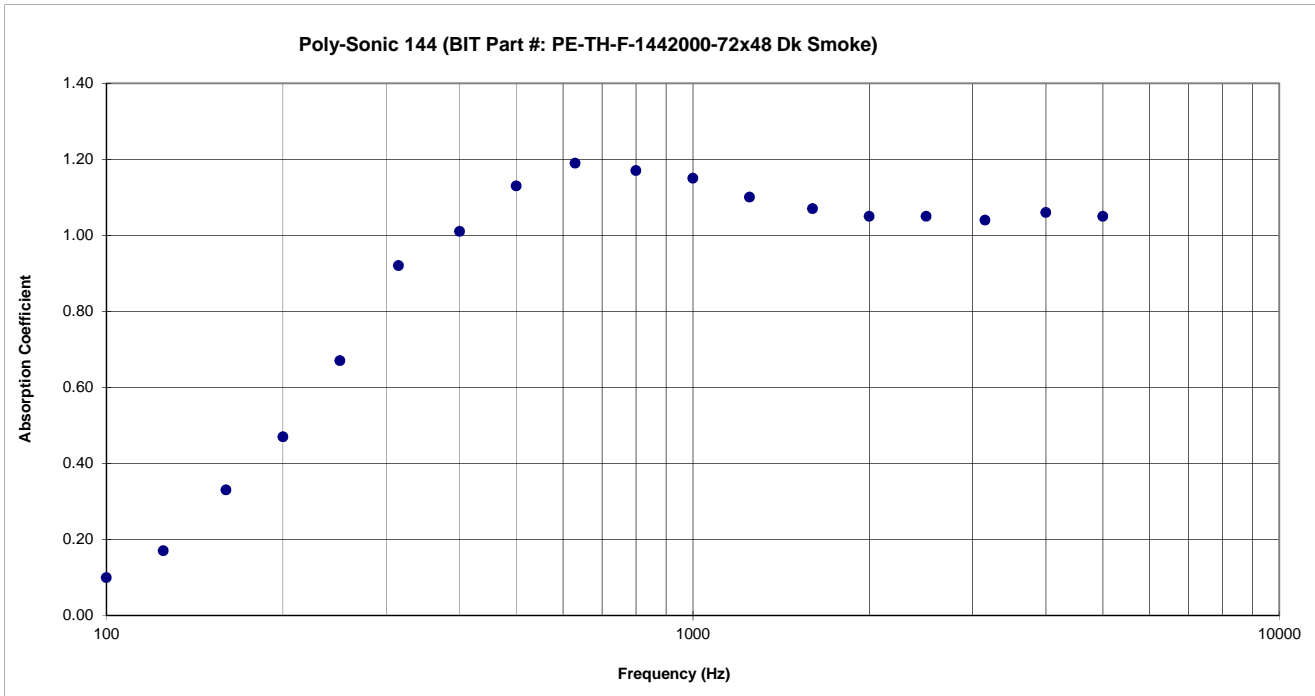
Date: 10/15/2019

Summary of Test Results :

Frequency (Hz)	Absorption Coefficient	Absorption (Metric Sabins)	Absorption (Standard Sabins)
100	0.10	0.67	7.20
125	0.17	1.13	12.20
160	0.33	2.20	23.68
200	0.47	3.15	33.93
250	0.67	4.51	48.52
315	0.92	6.19	66.67
400	1.01	6.81	73.31
500	1.13	7.60	81.83
630	1.19	7.98	85.88
800	1.17	7.90	85.04
1000	1.15	7.72	83.04
1250	1.10	7.39	79.57
1600	1.07	7.21	77.63
2000	1.05	7.06	76.03
2500	1.05	7.05	75.84
3150	1.04	7.03	75.64
4000	1.06	7.11	76.58
5000	1.05	7.06	76.00

	Empty Room	Full Room
Temperature (deg. C):	21.50	21.60
% Relative Humidity:	45.70	45.80
Date:	10/15/2019	10/15/2019
Atmospheric Pressure (kPa):	98.3	

NRC	1.00
SAA	1.00





**Acoustic and Insulation
Product Testing Laboratories**

Test Number A190033_4_191015_C423

ASTM C423 Sound Absorption

Full Description:	Tested By:	Really Rine	
Weight (kg):	27.39	Weight (lb):	60.39
Area (sq. m):	6.73	Area (sq. ft.):	72.41
Mounting:	Type A - Surface Mounted		
Other Information:			

The purpose of this testing is to determine the sound absorptive properties of the submitted sample.

The test material description, whether by observation or as provided by the client, is as follows:
Poly-Sonic 144 (BIT Part #: PE-TH-F-1442000-72x48 Dk Smoke)

Each panel was characterized/measured in the Owens Corning Acoustic Research Center by Really Rine on October 09, 2019.

These measurements are documented below.
All measurements and calculations were conducted in accordance with Owens Corning Test Method(s):
W-01Ca, Density and Square Foot Weight
D01-Bg, Thickness of Insulation Board Products

A NIST traceable tape measure was used to obtain the lengths and widths of each panel. The lengths provided here are an average of 3 measurements, and the widths are an average of 3 measurements per panel. Per D-01Ae, the thickness measurements are an average of 3 measurements per panel.

The sum total area of the sample was 72.41 square feet.

Length (in.)	Width (in.)	Thickness (in.)	Weight (lbs.)	Density (pcf)	Area wt.(psf)
108.30	96.28	1.82	60.39	5.50	0.83

The sum total area of the sample was 6.73 square meters.

Length (m)	Width (m)	Thickness (mm)	Weight (kg)	Density (kg/m ³)	Area wt. (kg/m ²)
2.75	2.45	46.24	27.39	88.06	4.07

Individual panel data are available upon request.
All calculations and physical measurements include all components associated with this sample, unless otherwise noted.

The sample was given 24 hours to come to equilibrium with the atmospheric conditions of the test chamber.

The perimeter edge of the sample was sealed with an aluminum frame.
The facing side of the sample was exposed to the sound field.
The sample was placed in the designated ASTM C423 position within the 286.36 cu. m (10,110 cu. ft.) reverberation chamber. Details of this position may be obtained by request.
All ASTM E795 mounting requirements were met for this test.
The source speakers were located in positions 1 and 2 (standard locations) within the reverberation chamber. Details of this position may be obtained by request.