NORTH ORBIT
ACOUSTIC LABORATORIES

REPORT NUMBER	NOAL 22-0946
TEST METHOD	ASTM C423-22: ***Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method***
TEST SPONSOR	PolySorb, 4813 8th Ave NW, Seattle, WA 98107
ISSUED TO	PolySorb, 4813 8th Ave NW, Seattle, WA 98107
TEST SPECIMEN	1" PolySorb acoustic baffle
TEST DATE	September 29, 2022
REPORT DATE	November 14, 2022
TEST SITE	North Orbit Acoustic Laboratory Facility, 917 Rice Street, St. Paul, MN 55117
TECHNICIAN	D. Berg

CONTENTS

ELECTRONICALLY REPRODUCED SIGNATURE

DAVID M. BERG – LABORATORY MANAGER

ELECTRONICALLY REPRODUCED SIGNATURE

HEIDE GROSS – LABORATORY QUALITY MANAGER

ilac-MRA ACCREDITED

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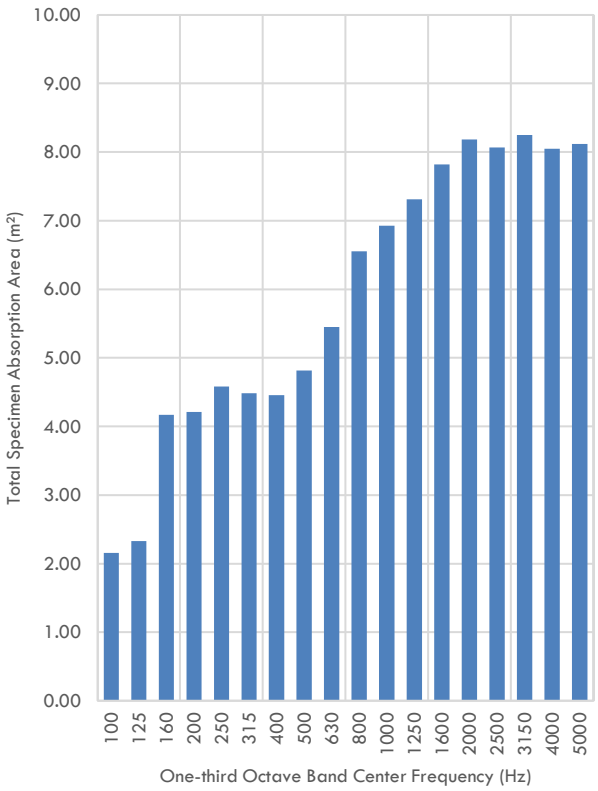
SECTION A – DATA SUMMARY

ABSORPTION PER UNIT



FREQUENCY Hz	UNIT ABSORPTION m²
100	0.216
125	0.233
160	0.417
200	0.421
250	0.458
315	0.449
400	0.446
500	0.482
630	0.545
800	0.655
1,000	0.693
1,250	0.731
1,600	0.782
2,000	0.818
2,500	0.806
3,150	0.825
4,000	0.805
5,000	0.812

SPECIMEN DESCRIPTION
1" PolySorb acoustic baffle, 16" deep by 60" long baffles spaced 16" OC. Mounted 4" from test surface
SPECIMEN MOUNTING
Type J Mounting - The specimen is a sound-absorbing unit or set of sound-absorbing units.

See Section C on page 4 and 5 for a full specimen description.

SECTION B – APPROACH

INSTALLATION

The specimen was installed for testing at the Saint Paul, MN acoustic laboratory facility. The specimen description can be found in Section C on page 4 of this report. Some details of the specimen design are proprietary and have been withheld at the request of the test sponsor.

Qualified representatives from North Orbit Acoustic Laboratories observed or performed the installation and inspected all major elements when completed and prior to testing.

Upon completion of the test, the specimen materials were returned to the test sponsor.

TEST METHODS

North Orbit Acoustic Laboratory (NOAL) is accredited through A2LA certificate number 4240.01 for this test method.

Test methods follow the published standards listed below.

ASTM C423-22: *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*

All results reported herein were derived from tests performed in full accordance with test method ASTM C423-22. The laboratory and measurement systems fully meet all requirements of the test standard and the requirements of ASTM C423-22 Annex A3: ***Tests to Qualify the Reverberation Room***. Measurement procedures and reverberation room descriptions and qualification documents are available upon request.

TEST REPORTS

This report does not constitute certification of the specimen under test, nor an opinion or endorsement by this laboratory. The report applies only to the specimen tested and may not be reproduced, except in full, without the permission of the client or test sponsor. It is the exclusive property of the test sponsor so named herein.

CONFIDENTIALITY

The test sponsor has full control over this information. Any release of information will be only to the test sponsor. The specific testing results are deemed to be confidential exclusively for the test sponsor's use. Reproduction of this report, except in full, is prohibited.

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SECTION C – SPECIMEN DESCRIPTION

The specimen is a 1″ baffle, manufactured by PolySorb. 1″ thick PET (polyethylene terephthalate) with a nominal density of 6 PCF. The specimen was installed according to Type J Mounting as specified in ASTM E795-16. Type J Mounting is a number of isolated objects or sound-absorbing units; in this case the units are simply supported flat panels (baffles) and the test surface was the bare concrete floor of the test chamber.

Each panel was 16″ x 60″ x 1″ [405 mm x 1,525 mm x 25.4 mm]. Panels were oriented with flat faces normal (perpendicular) to test surface and with the long edge of the face parallel to the test surface. Panels were mounted on steel studs to elevate the bottom of the panels 4″ [102 mm] from the test surface. Panels were arranged in five rows, each row spaced 16″ [405 mm] on centers (OC). Each row contained two panels spaced 16″ OC [405mm], for a total of ten panels. No treatment was applied to the panel edges. According to the test sponsor, the panel edges are exposed in typical installations.

SPECIMEN DETAIL	
Mounting Condition	Type J Mount (ASTM E795)
Number of Individual Units	10
Apparent Coverage Area	7.82 m² [84.1 SF]
Overall Mass	15.9 kg [35.0 lb]

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SECTION D – MEASUREMENT SET-UP

TEST ENVIRONMENT	
Chamber Temperature	22.9 °C [73.3 °F]
Chamber Relative Humidity	49.4%
Atmospheric Pressure	99.54 kPa [29.39" Hg]
Chamber Volume	348.62 m³ [12,312 CF]

INSTRUMENTATION

DESCRIPTION	BRAND	MODEL	SERIAL
Analyzer	Sinus	Apollo	75110
Software	Sinus	Samurai	ver. 2.8.3
Microphone	Brüel & Kjær	4166	1727058
Preamplifier	Brüel & Kjær	2669C	2300986
Calibrator	Brüel & Kjær	4231	2416109
Thermohygrometer	Kestrel	5200	2311344

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SECTION E – TEST RESULTS

FREQUENCY BAND	TOTAL ABSORPTION		UNIT ABSORPTION	
Hz	m²	[SF]	m²	[SF]
100	2.16	[23.2]	0.216	[2.32]
125	2.33	[25.0]	0.233	[2.50]
160	4.17	[44.9]	0.417	[4.49]
200	4.21	[45.3]	0.421	[4.53]
250	4.58	[49.4]	0.458	[4.94]
315	4.49	[48.3]	0.449	[4.83]
400	4.46	[48.0]	0.446	[4.80]
500	4.82	[51.8]	0.482	[5.18]
630	5.45	[58.6]	0.545	[5.86]
800	6.55	[70.5]	0.655	[7.05]
1,000	6.93	[74.5]	0.693	[7.45]
1,250	7.31	[78.7]	0.731	[7.87]
1,600	7.82	[84.1]	0.782	[8.41]
2,000	8.18	[88.1]	0.818	[8.81]
2,500	8.06	[86.8]	0.806	[8.68]
3,150	8.25	[88.8]	0.825	[8.88]
4,000	8.05	[86.6]	0.805	[8.66]
5,000	8.12	[87.4]	0.812	[8.74]

NOTES:

The unit absorption describes the amount of absorption from each individual unit. Unit absorption only represents the tested configuration. Different in configurations result in different absorption characteristics, in particular the configuration of distance from other units and distance from the test surface.

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ATTACHEMENT 1 – ABORPTION COEFICIENTS

NON-STANDARDIZED COMPUTATION OF ABSORPTION COEFICIENTS

The ASTM C423-22 test method does not include an absorption coefficient for isolated objects and does not include SAA or NRC ratings for isolated objects. The calculations in this attachment to determine apparent absorption coefficients and apparent ratings are non-standardized and are for reference only.

The apparent sound absorption coefficient is based upon the apparent coverage area over the test surface from the array of isolated objects. The apparent coverage area is the area of the test surface that the arrangement of units covers, and if extended across a larger surface would continue the pattern of the units. This is dependent upon the size and orientation of the units as well as the spacing of units to each other.

The apparent coverage area is the divisor below the total measured absorption of the specimen to calculate the apparent absorption coefficient. The apparent SAA and the apparent NRC calculations follow ASTM C423 using the apparent sound absorption coefficients as inputs. Neither the apparent absorption coefficient nor the apparent coverage area are a part of either the ASTM C423-22 standard or the ASTM E795-16 standard.

SPECIMEN DETAIL	
Mounting Condition	Type J Mount (ASTM E795)
Apparent Coverage Area	7.82 m² [84.1 SF]

APPARENT ABSORPTION COEFFICIENT RESULTS

The results shown only represent the tested configuration, in particular the configuration of distance from other units and distance from the test surface.

FREQUENCY BAND	APPARENT ABSORPTION COEFFICIENT
Hz	dimensionless
100	0.28
125	0.30
160	0.53
200	0.54
250	0.59
315	0.57
400	0.57
500	0.62
630	0.70
800	0.84
1,000	0.89
1,250	0.94
1,600	1.00
2,000	1.05
2,500	1.03
3,150	1.05
4,000	1.03
5,000	1.04
APPARENT SAA (SOUND ABSORPTION AVERAGE)	**0.78**
APPARENT NRC (NOISE REDUCTION COEFFICIENT)	**0.80**