

# REPORT

3933 US ROUTE 11 CORTLAND, NEW YORK 13045

Order No. 104030097

Date: August 23, 2019

**REPORT NO. 104030097CRT-001**

**SOUND ABSORPTION TEST ON  
PROFILE SERIES - PRFL-44 FIXTURES**

**RENDERED TO**

**SCW CORP DBA DAY-O-LITE  
126 CHESTNUT ST  
WARWICK, RI 02888-2104**

## **INTRODUCTION**

This report gives the results of a Sound Absorption test on Profile Series - PRFL-44 Fixtures. The test specimen was selected and supplied by the client and received at the laboratories on July 25, 2019. The sample appeared to be in a new, unused condition.

## **AUTHORIZATION**

Signed Intertek Quotation No. Qu-00967873-0.

## **TEST METHOD**

The specimen was tested in accordance with the American Society for Testing and Materials designation ASTM C423-2017, "Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method".

## **GENERAL**

This test method describes the measurement of sound absorption by analyzing the decay rate of sound in a reverberation room. The difference of the decay with and without the specimen in the room is utilized to determine the sound absorption of the specimen under test. Intertek Testing Services Acoustical Facilities utilizes a 16,640 cu. ft. (470 cubic meter) reverberation room.

## **DESCRIPTION OF TEST SPECIMEN**

The test Profile Series - PRFL-44 Fixtures consisted of six light fixtures installed above the concrete floor of our 16,640 cu. ft. reverberation room. Each sample measured 96 inches long by 3 7/8 inches wide by 11 7/8 inches tall. The samples were spaced 30 inches apart and were 29 inches above the floor.



**RESULTS OF TEST**

**PROFILE SERIES - PRFL-44 FIXTURES**

<u>One Third Octave Band Center Frequency, Hz</u>	<u>Total Sample Absorption Sabines (m<sup>2</sup>)</u>	<u>Sample Absorption Per Unit Sabines (m<sup>2</sup>)</u>
80	4.831	0.805
100	1.614	0.269
125	5.552	0.925
160	5.542	0.924
200	5.312	0.885
250	4.547	0.758
315	6.101	1.017
400	3.927	0.655
500	5.518	0.920
630	6.279	1.047
800	5.555	0.926
1000	8.470	1.412
1250	8.097	1.349
1600	10.339	1.723
2000	9.666	1.611
2500	9.746	1.624
3150	10.589	1.765
4000	9.899	1.650
5000	9.336	1.556

**MOUNTING:** Type “J” per ASTM Designation E795-16, “Standard Practices for Mounting Test Specimens During Sound Absorption Tests”.

**REMARKS**

1. Aging Period: None
2. Ambient Temperature: 74°F
3. Relative Humidity: 62%

**CONCLUSION**

The test method employed for this test has no pass-fail criteria, therefore, the evaluation of the test results is left to the discretion of the client.

Date of Test: August 7, 2019

Report Approved by:



Brian Cyr  
Engineer  
Acoustical Testing

Report Reviewed By:



James R. Kline  
Engineer/Quality Supervisor  
Acoustical Testing

Attachments: None

### Apparent Sound Absorption Coefficients from Sabine per unit absorption values

There is no standard way to calculate the absorption coefficients for non-standard shapes or sizes per ASTM C423. The typical mounting position used for ASTM C423 is type A. This provides an absorption coefficient for a flat material with a known surface area. To calculate the absorption coefficients for a non-standard area there are several approaches that have been used by labs.

The first approach is calculating the sound absorption coefficient from the total area occupied by the sample. This would include all spaces in between samples. If the sample total dimension were 10 by 10 feet the area used for calculating the absorption coefficient would be 100 square feet.

The second approach is to use total exposed surface area of the test sample. The area of each face is added up and used as the area for calculating the absorption coefficient. If the sample measured 12x12x144 inches the surface area would be 50 square feet.

The third approach is calculating the absorption coefficient from one large face of each test specimen. If the sample were 12x12x144 inches the surface area used for the calculating the sound absorption coefficient would be 12 square feet.

Depending on the size of the sample each of these approaches can provide inaccurate numbers. In each approach the values are all non-standard and not in accordance with any test standard.

For the test sample shown below the area calculations are as follows.

Area for approach 1: 115.6 square feet

Area for approach 2: 129.8 square feet

Area for approach 3: 47.5 square feet



## Non-Standard Apparent Sound Absorption Coefficient Results

One Third Octave Band Center Frequency, <u>Hz</u>	Sabines Absorption (m <sup>2</sup> )	Sabines Absorption / Unit (m <sup>2</sup> )	Approach 1 Absorption Coefficients <u>Sabins/m<sup>2</sup></u>	Approach 2 Absorption Coefficients <u>Sabins/m<sup>2</sup></u>	Approach 3 Absorption Coefficients <u>Sabins/m<sup>2</sup></u>
80	4.831	0.805	0.45	0.40	1.09
100	1.614	0.269	0.15	0.13	0.37
125	5.552	0.925	0.52	0.46	1.26
160	5.542	0.924	0.52	0.46	1.26
200	5.312	0.885	0.49	0.44	1.20
250	4.547	0.758	0.42	0.38	1.03
315	6.101	1.017	0.57	0.51	1.38
400	3.927	0.655	0.37	0.33	0.89
500	5.518	0.920	0.51	0.46	1.25
630	6.279	1.047	0.58	0.52	1.42
800	5.555	0.926	0.52	0.46	1.26
1000	8.470	1.412	0.79	0.70	1.92
1250	8.097	1.349	0.75	0.67	1.83
1600	10.339	1.723	0.96	0.86	2.34
2000	9.666	1.611	0.90	0.80	2.19
2500	9.746	1.624	0.91	0.81	2.21
3150	10.589	1.765	0.99	0.88	2.40
4000	9.899	1.650	0.92	0.82	2.24
5000	4.831	1.556	0.87	0.77	2.12
<u>Apparent Sound Absorption Average (SAA)</u>			0.65	0.58	1.58
<u>Apparent NRC</u>			0.65	0.60	1.60

The sound absorption coefficient is ideally defined as the fraction of the randomly incident sound power absorbed by the material. The greater the coefficient, the greater the sound absorption.

The Noise Reduction Coefficient (NRC) is a single number rating obtained by taking the arithmetic average of the absorption coefficients at 250, 500, 1000, and 2000 Hz rounded to the nearest multiple of 0.05.

The Sound Absorption Average (SAA) is a single number rating obtained by taking the arithmetic average of the one-third octave bands from 200 through 2500 Hz rounded to the nearest 0.01.