

Test Report

SPONSOR: **ezoBord**
Mississauga, Ontario, Canada

Sound Absorption
RAL™-A19-232

CONDUCTED: 2019-06-04

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ON: Workzone Divider 12 mm - 2 panels standing vertically, spaced 6 in. apart

TEST METHODOLOGY

Riverbank Acoustical Laboratories™ is accredited by the U.S. Department of Commerce, National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) as an ISO 17025:2005 Laboratory (NVLAP Lab Code: 100227-0) and for this test procedure. The test reported in this document conformed explicitly with ASTM C423-17: "Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method." The specimen mounting was performed according to ASTM E795-16: "Standard Practices for Mounting Test Specimens During Sound Absorption Tests." A description of the measurement procedure and room specifications are available upon request. The results presented in this report apply to the sample as received from the test sponsor.

INFORMATION PROVIDED BY SPONSOR

The test specimen was designated by the sponsor as Workzone Divider 12 mm - 2 panels standing vertically, spaced 6 in. apart. The following nominal product information was provided by the sponsor prior to testing. The accuracy of such sponsor-provided information can affect the validity of the test results.

Product Under Test

Trade Name: Workzone Divider
Manufacturer: ezoBord
Material: Polyethylene terephthalate
Thickness: 12 mm (0.472 in.)

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SPECIMEN MEASUREMENTS & TEST CONDITIONS

Through a full external visual inspection performed on the test specimen, Riverbank personnel verified the following information:

Test Specimen

Materials: Semirigid felt panels
Dimensions: 2 @ 1206.5 mm (47.5 in.) x 2438.4 mm (96 in.)
Thickness: 12.8 mm (0.504 in.)
Holes: 42 circular holes per panel, distributed around panel area
5 holes per panel @ 114.3 mm (4.5 in.) diameter
17 holes per panel @ 65.1 mm (2.56 in.) diameter
20 holes per panel @ 46 mm (1.81 in.) diameter
Overall Weight: 12.81 kg (28.25 lbs)

Physical Measurements (per unit)

Dimensions: 1.21 m (47.5 in) wide by 2.44 m (96.0 in) long
Thickness: 0.01 m (0.504 in)
Weight: 6.52 kg (14.37 lbs)

Test Environment

Room Volume: 291.98 m³
Temperature: 21.9 °C ± 0.1 °C (Requirement: ≥ 10 °C and ≤ 5 °C change)
Relative Humidity: 61.8 % ± 0.0 % (Requirement: ≥ 40 % and ≤ 5 % change)
Barometric Pressure: 98.8 kPa (Requirement not defined)

Each sound absorbing unit had an absorptive area (all exposed surfaces) of 5.78 m² (62.25 ft²). The total absorptive area (all exposed surfaces) of all sound-absorbing units was 11.57 m² (124.50 ft²). The array of units covered 6.26 m² (67.33 ft²) of vertical area.

MOUNTING METHOD

Type J Mounting: The specimen is a coplanar array of two (2) sound absorbing units spaced 152.4 mm (6 in.) apart. The units rested directly against the horizontal test surface and were steadied with a single cable mounted to the test chamber walls. This installation approximates the intended field installation of the product.

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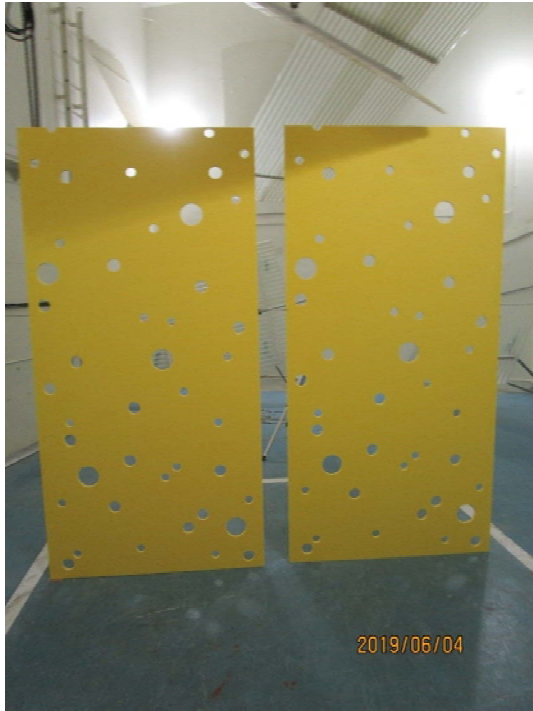


Figure 1 – Specimen mounted in test chamber



Figure 2 – Detail of specimen material

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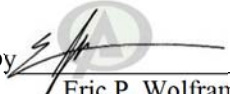
TEST RESULTS

Note: There is currently no standardized method for calculating Absorption Coefficients from spaced object absorbers. The sound absorption performance of spaced object absorbers should not be compared directly with specimens tested as a single rectangular area (e.g. mounting types A, E, etc.).

1/3 Octave Center Frequency (Hz)	Total Absorption		Absorption per Unit	
	(m ²)	(Sabins)	(m ² / Unit)	(Sabins / Unit)
100	1.80	19.38	0.90	9.69
** 125	2.50	26.95	1.25	13.48
160	3.04	32.68	1.52	16.34
200	3.16	34.05	1.58	17.02
** 250	3.27	35.15	1.63	17.58
315	4.07	43.85	2.04	21.93
400	4.18	45.02	2.09	22.51
** 500	4.55	48.92	2.27	24.46
630	5.08	54.67	2.54	27.33
800	5.54	59.68	2.77	29.84
** 1000	6.11	65.81	3.06	32.90
1250	6.47	69.60	3.23	34.80
1600	6.88	74.03	3.44	37.02
** 2000	7.48	80.53	3.74	40.27
2500	7.73	83.19	3.86	41.59
3150	8.10	87.18	4.05	43.59
** 4000	8.44	90.87	4.22	45.43
5000	8.74	94.11	4.37	47.06

Tested by 
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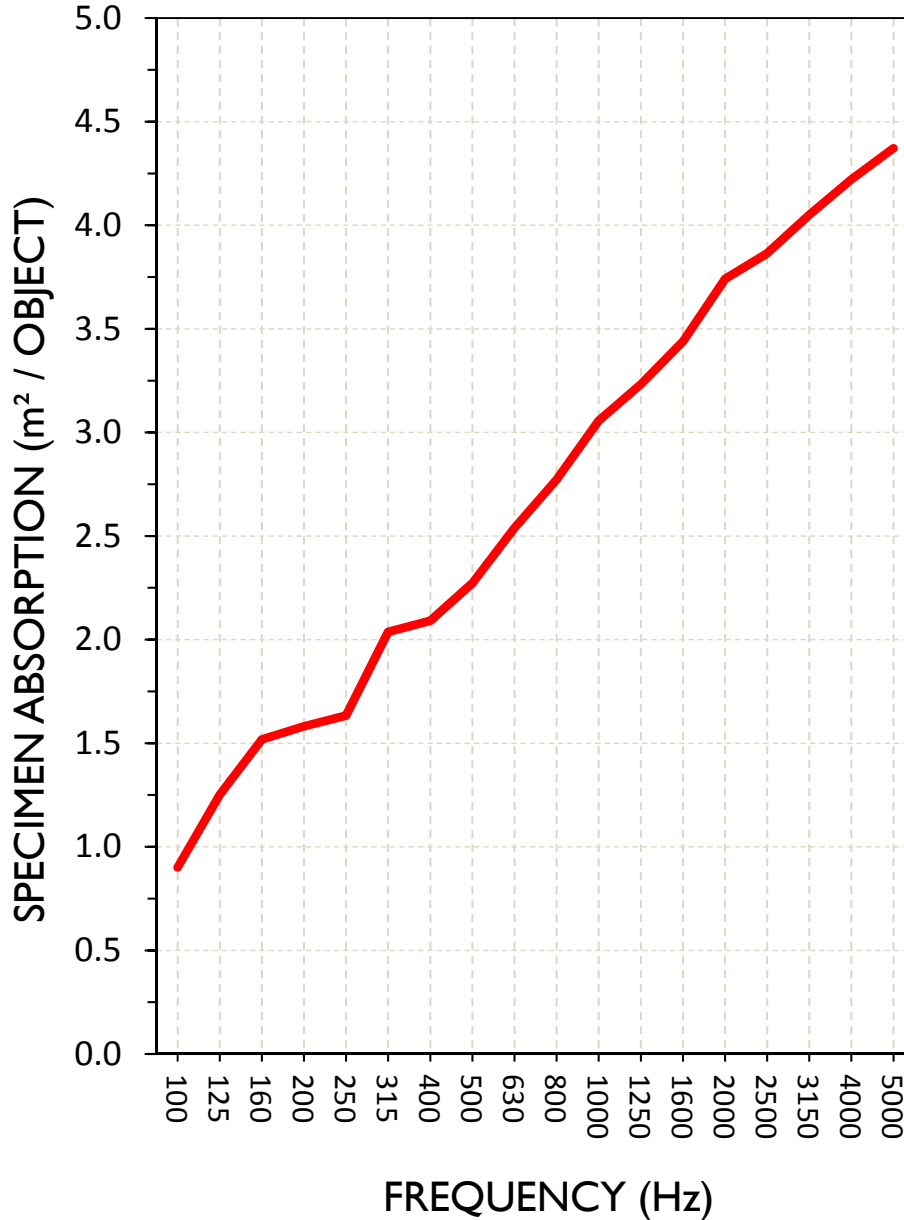
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SOUND ABSORPTION REPORT

Workzone Divider 12 mm - 2 panels standing vertically, spaced 6 in. apart



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APPENDIX A: Extended Frequency Range Data

Specimen: Workzone Divider 12 mm - 2 panels standing vertically, spaced 6 in. apart (See Full Report)

The following non-accredited data were obtained in accordance with ASTM C423-17, but extend beyond the defined frequency range of 100Hz to 5,000Hz. These unofficial results are representative of the RAL test environment only and intended for research & comparison purposes.

1/3 Octave Band Center Frequency (Hz)	Total Absorption		Absorption per Unit	
	(m ²)	(Sabins)	(m ² / Unit)	(Sabins / Unit)
31.5	0.09	0.96	0.04	0.48
40	-1.16	-12.46	-0.58	-6.23
50	1.26	13.60	0.63	6.80
63	1.16	12.53	0.58	6.26
80	1.36	14.59	0.68	7.29
100	1.80	19.38	0.90	9.69
125	2.50	26.95	1.25	13.48
160	3.04	32.68	1.52	16.34
200	3.16	34.05	1.58	17.02
250	3.27	35.15	1.63	17.58
315	4.07	43.85	2.04	21.93
400	4.18	45.02	2.09	22.51
500	4.55	48.92	2.27	24.46
630	5.08	54.67	2.54	27.33
800	5.54	59.68	2.77	29.84
1000	6.11	65.81	3.06	32.90
1250	6.47	69.60	3.23	34.80
1600	6.88	74.03	3.44	37.02
2000	7.48	80.53	3.74	40.27
2500	7.73	83.19	3.86	41.59
3150	8.10	87.18	4.05	43.59
4000	8.44	90.87	4.22	45.43
5000	8.74	94.11	4.37	47.06
6300	9.15	98.53	4.58	49.26
8000	10.01	107.77	5.01	53.89
10000	10.11	108.87	5.06	54.44
12500	10.30	110.82	5.15	55.41

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APPENDIX B: Instruments of Traceability

Specimen: Workzone Divider 12 mm - 2 panels standing vertically, spaced 6 in. apart (See Full Report)

<u>Description</u>	<u>Model</u>	<u>Serial Number</u>	<u>Date of Certification</u>	<u>Calibration Due</u>
System 1	Type 3160-A-042	System 1	2018-08-09	2019-08-09
Bruel & Kjaer Mic And Preamp A	Type 4943-B-001	2311428	2018-09-28	2019-09-28
Bruel & Kjaer Pistonphone	Type 4228	2781248	2018-08-06	2019-08-06
EXTECH Hygro 662	SD700	A083662	2018-11-29	2019-11-29

APPENDIX C: Revisions to Original Test Report

Specimen: Workzone Divider 12 mm - 2 panels standing vertically, spaced 6 in. apart (See Full Report)

<u>Date</u>	<u>Revision</u>
2019-06-13	Original report issued

END

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ON: Workzone Divider 12mm - 2 panels standing vertically, spaced 6 in. apart (See Full Test Report for Details)

Appendix D to ASTM C423 Sound Absorption Test

Non-standard calculation of equivalent NRC Rating and Absorption Coefficients from spaced absorbers

At this time ASTM C423 does not provide a standard method for determining absorption coefficients of spaced object absorbers. Tests of a set of sound absorbing objects spaced apart from each other will yield higher absorption rates than a specimen joined together as a single patch (A-Mount or E-Mount). For this reason it is unfair to provide NRC or absorption coefficient ratings for specimens that consist of a spaced set of absorbers. Despite this, the architectural industry has expressed great demand for a simple "single number" rating for these treatments. Likewise, acoustical consultants desire equivalent absorption coefficient data for use in acoustical modeling software. The following is an attempt to appease these demands until ASTM develops a standard method for calculation. Several alternate non-standard calculation methods are provided. Riverbank Acoustical Laboratories prefers method 1.

Method 1) Apparent Sound Absorption Coefficient calculated from total test surface area covered

The total sound absorption yielded by the specimen is divided by the total surface area of the test surface covered by the suspended units, including intermediate spaces. The unit rigging covered 6.26 m² (67.33 ft²) of vertical surface area. With an extra 152.4 mm (6 in.) of width to account for the space between the tested array and what would be the next unit in a larger array, the surface area comes to 6.63 m² (71.33 ft²). Apparent Noise Reduction Coefficient (NRC) rating and Sound Absorption Average (SAA) figures are calculated from this data based on the methods described in ASTM C423-17. This may be the most accurate method for comparing unit arrays to ceiling tile products. The apparent sound absorption coefficient data can be assigned to a single vertical plane in acoustical modeling software for approximation of unit array performance. Such approximations rely on the assumption that unit spacing is similar to that of the tested array.

Method 2) Apparent Sound Absorption Coefficient calculated from total exposed surface area of specimen

The total sound absorption yielded by the specimen is divided by the total surface area of all exposed specimen faces (5.78 m² (62.25 ft²) per unit x 2 units = 11.57 m² (124.50 ft²) total surface area). Apparent Noise Reduction Coefficient (NRC) rating and Sound Absorption Average (SAA) figures are calculated from this data based on the methods described in ASTM C423-17. This method shows the actual absorption occurring at the exposed surfaces, but does not provide a fair comparison with materials mounted as a uniform patch (in A-mount or E-mount).

Method 3) Apparent Sound Absorption Coefficient calculated from one face per unit

The total sound absorption yielded by the specimen is divided by the surface area of one side of one large face for each unit in the specimen (2.94 m² (31.67 ft²) per unit x 2 units = 5.88 m² (63.33 ft²) total surface area). Apparent Noise Reduction Coefficient (NRC) rating and Sound Absorption Average (SAA) figures are calculated from this data based on the methods described in ASTM C423-17. This method is favored by some material manufacturers since it yields very high NRC figures, but does not provide a fair comparison with other ceiling tile or wall panel products. Riverbank Acoustical Laboratories recommends that results obtained from this method be used for research and comparison purposes only; such results should not be used for marketed claims of product performance.

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Appendix D: Data Note: See full test report for details of mounting position, spacing, and configuration, as these parameters greatly affect sound absorption performance.

Specimen Absorption			Method 1	Method 2	Method 3	
			Apparent Abs. Coefficient From Total Coverage Area	Apparent Abs. Coefficient From Total Exposed Surface Area	Apparent Abs. Coefficient From One Face/Baffle	
Freq. (Hz)	Sabins	Sabins / Unit				
31.5	0.96	0.48	0.01	0.01	0.02	
40	-12.46	-6.23	-0.17	-0.10	-0.20	
50	13.60	6.80	0.19	0.11	0.21	
63	12.53	6.26	0.18	0.10	0.20	
80	14.59	7.29	0.20	0.12	0.23	
100	19.38	9.69	0.27	0.16	0.31	
125	26.95	13.48	0.38	0.22	0.43	
160	32.68	16.34	0.46	0.26	0.52	
200	34.05	17.02	0.48	0.27	0.54	
250	35.15	17.58	0.49	0.28	0.56	
315	43.85	21.93	0.61	0.35	0.69	
400	45.02	22.51	0.63	0.36	0.71	
500	48.92	24.46	0.69	0.39	0.77	
630	54.67	27.33	0.77	0.44	0.86	
800	59.68	29.84	0.84	0.48	0.94	
1,000	65.81	32.90	0.92	0.53	1.04	
1,250	69.60	34.80	0.98	0.56	1.10	
1,600	74.03	37.02	1.04	0.59	1.17	
2,000	80.53	40.27	1.13	0.65	1.27	
2,500	83.19	41.59	1.17	0.67	1.31	
3,150	87.18	43.59	1.22	0.70	1.38	
4,000	90.87	45.43	1.27	0.73	1.43	
5,000	94.11	47.06	1.32	0.76	1.49	
6,300	98.53	49.26	1.38	0.79	1.56	
8,000	107.77	53.89	1.51	0.87	1.70	
10,000	108.87	54.44	1.53	0.87	1.72	
12,500	110.82	55.41	1.55	0.89	1.75	
			Apparent NRC:	0.80	0.45	0.90
			Apparent SAA:	0.81	0.46	0.91

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