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Technical Note

Measurement of Sound Absorption for Flex Acoustics AqTube

Performed for Flex Acoustics

TC-100294
Project no.: T202611

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Title
Measurement of Sound Absorption for Flex Acoustics AqTube

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1. Introduction

At the request of Flex Acoustics laboratory measurements of the sound absorption in a reverberation room were carried out for Flex Acoustics AqTube in different configurations.

This technical note only presents the test specimens and the test results summarily.

2. Description of the Test Objects

The AqTube absorber is an inflatable membrane shaped as a tube. The absorber was tested in the following configurations. OFF refers to empty tube. ON refers to air-filled tube:

1. AqTube OFF, double tubes mounted in lines in an array in a frame (3.00 m x 3.60 m x 1.20 m), 3 samples, c-c 1.00 m

2. AqTube ON, double tubes mounted in lines in an array in a frame (3.00 m x 3.33 m x 1.00 m), 3 samples, c-c 1.00 m

3. AqTube ON, double tubes mounted in lines in an array in a frame (3.00 m x 3.33 m x 1.00 m), 4 samples, c-c 0.75 m

4. AqTube ON, double tube mounted as a discrete object, one sample, measured in two different positions

The size of AqTube ON, double tube is approx. 0.7 m x 3.2 m x 1.0 m.

3. Test Results

The measurements were carried out according to the test method of EN ISO 354:2003, “Acoustics - Measurement of Sound Absorption in a Reverberation Room”.

The sound absorption was calculated from the reverberation times measured with and without the test object.

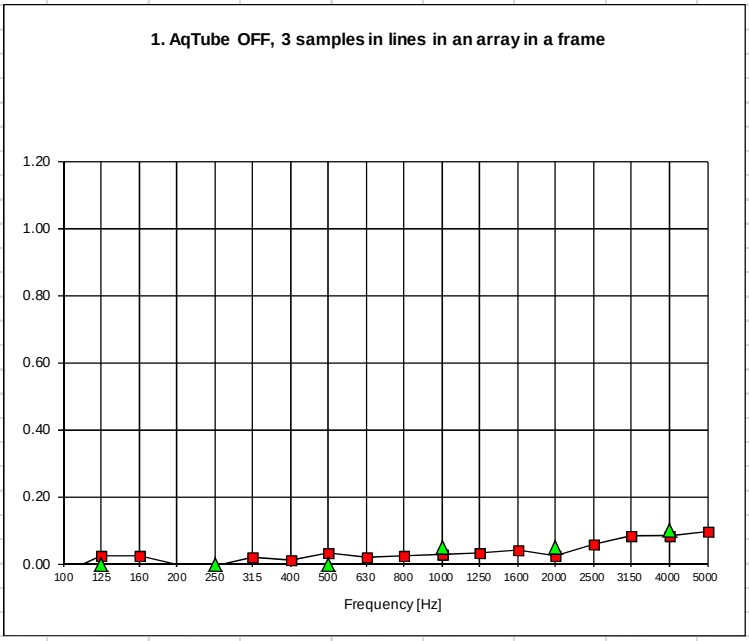
The measurements with tubes in lines were performed with a frame surrounding the tubes (Type J mounting), and the empty room was measured with the frame present. The results are given as the sound absorption coefficient.

The measurements with a tube as a discrete object were performed with two different randomly chosen positions, and the results are given as the mean value of the equivalent sound absorption area per object.

The measurements were performed in room 005, Building 355 at the Technical University of Denmark.

The test results per one-third octave from 50 Hz to 5000 Hz are shown in tabular form and graphically on the following graph sheets. Additionally the calculated values per octave from 63 Hz to 4000 Hz are shown.

Frequency	alfa s	alfa p
Hz		
50	-0.04	
63	0.01	0.00
80	-0.03	
100	-0.03	
125	0.02	0.00
160	0.02	
200	0.00	
250	-0.01	0.00
315	0.02	
400	0.01	
500	0.03	0.00
630	0.02	
800	0.02	
1000	0.03	0.05
1250	0.03	
1600	0.04	
2000	0.02	0.05
2500	0.06	
3150	0.08	
4000	0.08	0.10
5000	0.10	



Sound absorption measurement

DELTA Acoustics

Date of test 27-04-2012

Measurement 1

Sound absorption coefficient for AqTube OFF, double tubes mounted in lines in an array in a frame (3.00 m x 3.60 m x 1.20 m), 3 samples, c-c 1.00 m.

Frequency	alfa s	alfa p
Hz		
50	0.26	
63	0.31	0.30
80	0.37	
100	0.35	
125	0.28	0.35
160	0.42	
200	0.33	
250	0.34	0.35
315	0.44	
400	0.54	
500	0.56	0.55
630	0.52	
800	0.45	
1000	0.38	0.40
1250	0.33	
1600	0.25	
2000	0.17	0.20
2500	0.16	
3150	0.14	
4000	0.13	0.15
5000	0.11	

Sound absorption measurement

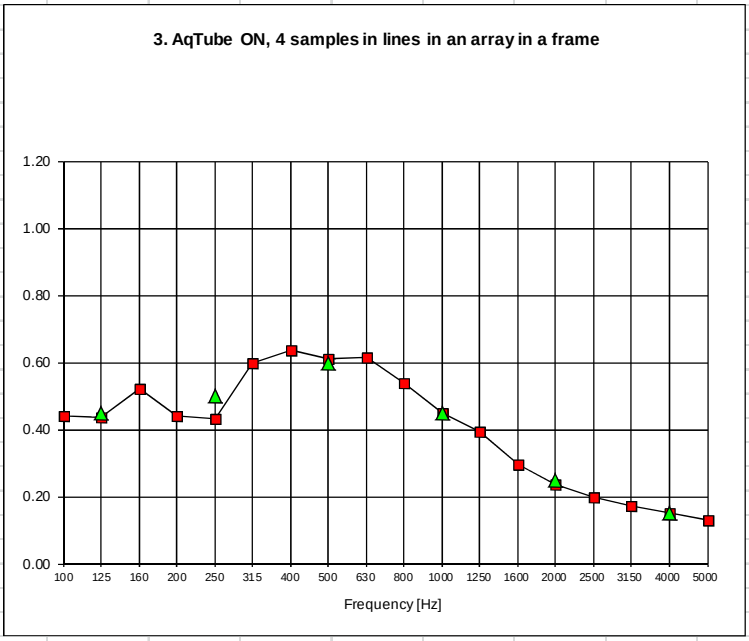
DELTA Acoustics

Date of test 27-04-2012

Measurement 2

Sound absorption coefficient for AqTube ON, double tubes mounted in lines in an array in a frame (3.00 m x 3.33 m x 1.00 m), 3 samples, c-c 1.00 m.

Frequency	alfa s	alfa p
Hz		
50	0.41	
63	0.41	0.40
80	0.43	
100	0.44	
125	0.43	0.45
160	0.52	
200	0.44	
250	0.43	0.50
315	0.60	
400	0.64	
500	0.61	0.60
630	0.62	
800	0.54	
1000	0.45	0.45
1250	0.39	
1600	0.30	
2000	0.24	0.25
2500	0.20	
3150	0.17	
4000	0.15	0.15
5000	0.13	



Sound absorption measurement

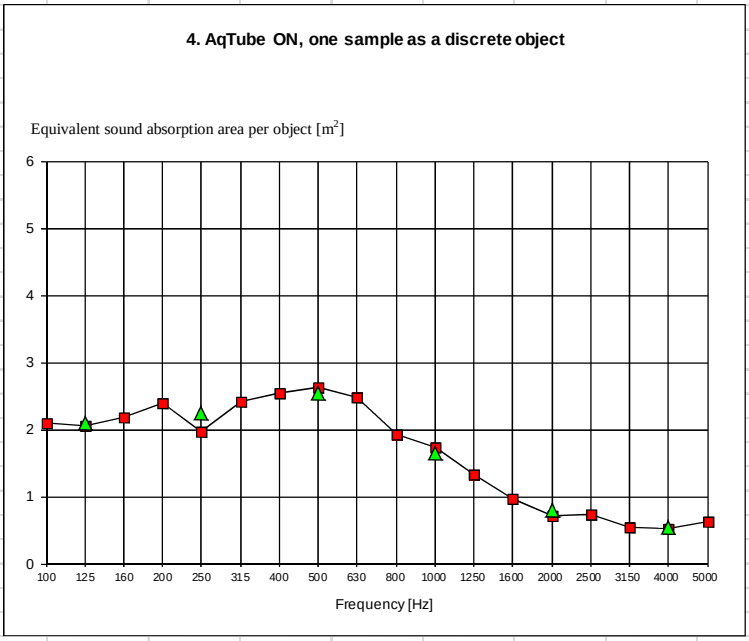
DELTA Acoustics

Date of test 27-04-2012

Measurement 3

Sound absorption coefficient for AqTube ON, double tubes mounted in lines in an array in a frame (3.00 m x 3.33 m x 1.00 m), 4 samples, c-c 0.75 m.

Frequency	A	A
Hz	m2	m2
50	0.04	
63	0.43	0.40
80	0.67	
100	2.09	
125	2.05	2.10
160	2.17	
200	2.40	
250	1.97	2.25
315	2.43	
400	2.55	
500	2.62	2.55
630	2.48	
800	1.92	
1000	1.73	1.65
1250	1.34	
1600	0.97	
2000	0.70	0.80
2500	0.74	
3150	0.55	
4000	0.53	0.55
5000	0.63	



Sound absorption measurement

DELTA Acoustics

Date of test 20-11-2012

Measurement 4

Equivalent sound absorption area per object for AqTube ON, double tube mounted as a discrete object, one sample, measured in two different positions.