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Frapett Produktion AB

Measurements of sound absorption characteristics
for wall sound absorbers from Frapett Produktion
AB

2012-10-10

Established by: Marcus Spovell
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REPORT 10172721.01

Frapett Produktion AB
Measurements of sound absorption characteristics for wall sound absorbers from Frapett Produktion AB

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Introduction

WSP Acoustics has performed sound absorption measurements on some of the acoustic products from Frapett Produktion AB.

Tested objects

The tested objects are different configurations of wall sound absorbers from Frapett Produktion AB with a density of 52 kg / m^3 covered with two different Fabrics

1. Blazer 1 and 2 – Camira Fabrics
2. EyeandEar – Almedahls

The different configurations were used in order to see if it will affect the classification according to SS-EN ISO 11654 and to give a correct sound absorption area / object when they are mounted as single objects, for example on a wall. The different configurations are shown below. Every single object has an area that equals 1,14 x 1,14 m^2. All measurements were made with "open edges".

- 4 objects scattered
- 6 objects assembled
- 6 objects scattered
- 9 objects assembled

There are no different results due to different fabrics according to 1 and 2 above.

Measurements

The measurements were performed according to SS-EN ISO 354. They were made in a laboratory in Skultorp (Akustikverkstan AB), www.akustikverkstan.se, and the laboratory equipment was used to perform the measurements.

Comment: Equipment and laboratory conditions can be provided upon request.

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Results

Classification according to SS-EN ISO 11654

Single objects for sound absorption should not be classified according to SS-EN ISO 11654. However, these products fulfill sound absorption class A in all configurations. The most appropriate configurations to use in order to classify according to SS-EN ISO 11654 are no 2 and 4 below. Hence, classification should be applied only when the objects are assembled.

Test	Measurement object	Classification	Comment
1	*4 objects scattered*		*See below*
2	**6 objects assembled**	**A**	
3	*6 objects scattered*		*See below*
4	**9 objects assembled**	**A**	

Table 1: Results from evaluation of sound absorption class according to SS-EN ISO 11654.

Detailed information regarding sound absorption area and sound absorption factor in 1/3 octave bands and in octave bands is shown in tables and graphs below.

Measured sound absorption area

In the table below the measured sound absorption area is shown, for the total area of the entire configuration.

Frequency (Hz)	9 obj. assembled	6 obj. assembled	6 obj. scattered[1]	4 obj.scattered[1]
50	0,58	0,37	0,31	0,25
63	0,78	0,46	0,49	0,33
80	1,17	0,72	0,77	0,57
100	1,70	0,98	1,04	0,78
125	2,01	1,39	1,34	1,18
160	3,87	2,82	3,01	2,28
200	6,42	4,07	4,21	3,11
250	7,59	5,24	5,38	3,95
315	8,86	6,21	6,45	4,77
400	11,07	7,62	8,41	6,01
500	12,88	9,26	10,10	7,10
630	14,26	9,84	11,10	7,48
800	14,44	9,90	11,17	7,50
1000	14,64	9,69	10,95	7,53
1250	14,10	9,53	10,69	7,22
1600	13,84	9,02	10,11	6,68
2000	13,62	8,72	9,74	6,63
2500	13,62	8,78	9,42	6,24
3150	13,57	8,64	9,28	6,28
4000	13,40	8,84	9,34	6,23
5000	13,81	9,43	10,18	6,69

Table 2: Measured total sound absorption area, m^2, for the four different configurations.

[1] By dividing the results by 6 for the left column and by 4 for the right column the results become almost the same in terms of sound absorption area / object, see table 3.

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In table 3 below the measured sound absorption area is shown, for the total area of the entire configuration in 1/3 octave bands. In table 4 and figure 1 the values are given in octave bands.

Frequency (Hz)	Area / object (1)	Area / object (2)	Mean value
50	*0,05*	*0,06*	0,06
63	*0,08*	*0,08*	0,08
80	*0,13*	*0,14*	0,14
100	*0,17*	*0,19*	0,18
125	*0,22*	*0,29*	0,26
160	*0,50*	*0,57*	0,54
200	*0,70*	*0,78*	0,74
250	*0,90*	*0,99*	0,95
315	*1,08*	*1,19*	1,14
400	*1,40*	*1,50*	1,45
500	*1,68*	*1,78*	1,73
630	*1,85*	*1,87*	1,86
800	*1,86*	*1,87*	1,87
1000	*1,82*	*1,88*	1,84
1250	*1,78*	*1,80*	1,79
1600	*1,68*	*1,67*	1,67
2000	*1,62*	*1,66*	1,64
2500	*1,57*	*1,56*	1,56
3150	*1,55*	*1,57*	1,56
4000	*1,56*	*1,56*	1,56
5000	*1,70*	*1,67*	1,69

Table 3: Measured equivalent sound absorption area, m^2/ object.

Frequency (Hz)	A_{object}, m^2
63	0,1
125	0,3
250	0,9
500	1,7
1000	1,8
2000	1,6
4000	1,6

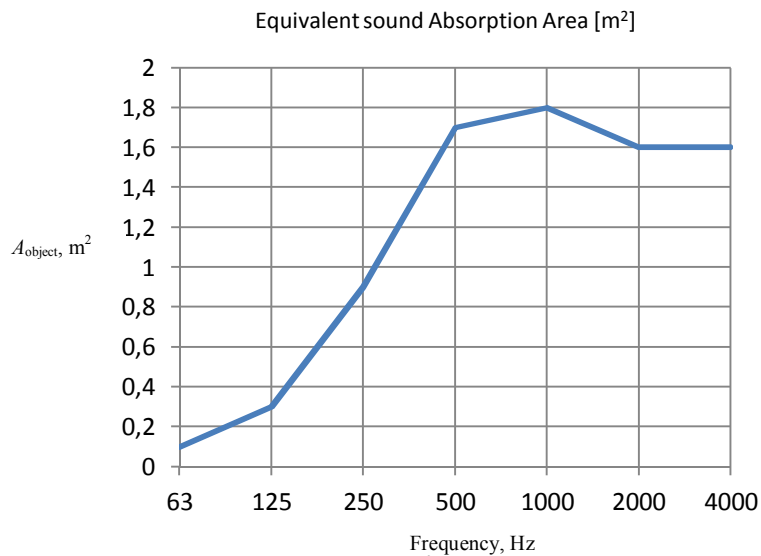**Table 4: Evaluated equivalent sound absorption area, m^2/ object, in octave bands.**

Figure 1: Equivalent sound absorption area, m^2/ object.

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Evaluated sound absorption factor for the two assembled configurations – α

In table 5 below evaluated sound absorption factor is shown for the two assembled configurations.

Frequency (Hz)	9 objects assembled	6 objects assembled
50	0,05	0,05
63	0,07	0,06
80	0,10	0,09
100	0,15	0,13
125	0,17	0,18
160	0,33	0,36
200	0,55	0,52
250	0,65	0,67
315	0,76	0,80
400	0,95	0,98
500	1,10	1,19
630	1,22	1,26
800	1,23	1,27
1000	1,25	1,24
1250	1,20	1,22
1600	1,18	1,16
2000	1,16	1,12
2500	1,16	1,13
3150	1,16	1,11
4000	1,15	1,13
5000	1,18	1,21

Table 5: Evaluated sound absorption factor, α, in 1/3 octave bands for the two assembled configurations.

For these two cases the weighted sound absorption coefficient and corresponding sound absorption class is evaluated and displayed in figure 2 and 3 below.
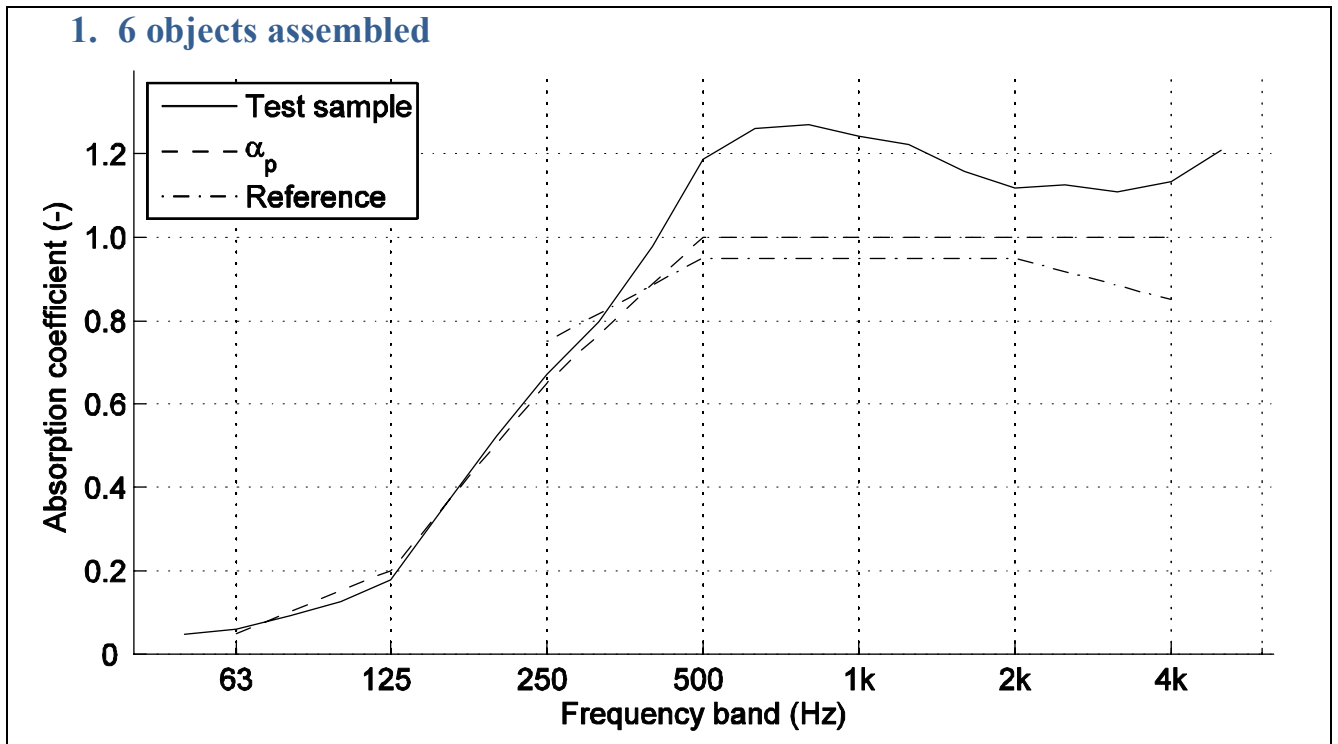
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Figure 2 – Evaluated sound absorption factor, α_p, and α_w, and corresponding sound absorption class according to SS-EN ISO 11654

$\alpha_w = 0,95$
sound absorption class A

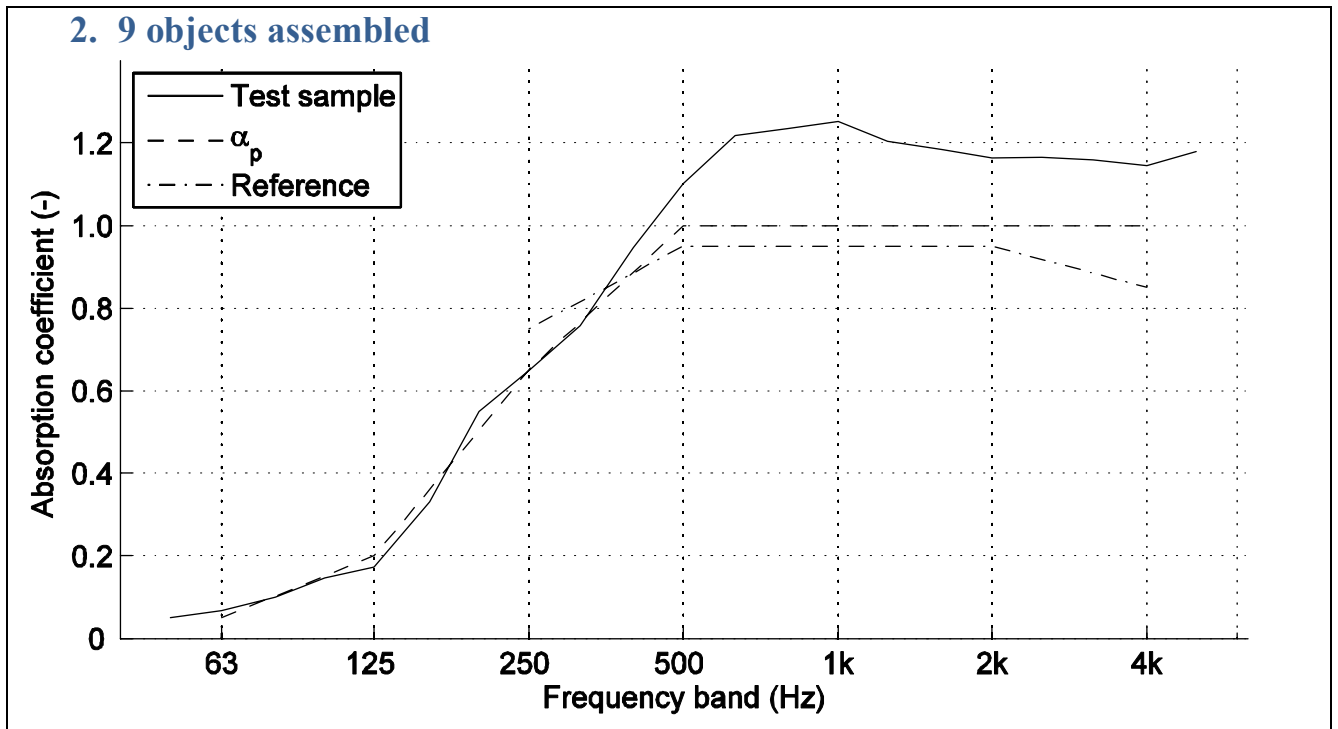| Commission no: 10172721	Measurements of sound absorption characteristics for wall sound absorbers from Frapett Produktion AB	
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Figure 3 – Evaluated sound absorption factor, α_p, and α_w, and corresponding sound absorption class according to SS-EN ISO 11654

$\alpha_w = 0,95$
sound absorption class A

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Comments

The test objects fulfill sound absorption class A according to SS-EN ISO 11654. When the objects are mounted separately (as single objects) results from table 4 should be applied in calculations.