



Measurement report

Idea-Puu Oy

KAIKUA variable acoustic wall panel –
sound absorption measurements

9.11.2020

Project 3436-1





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1. General information

1.1. Customer

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1.2. Measurements and report

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HVAC and Acoustics laboratory (Valimo)
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1.3. Date

Measurements: 27. –28.10.2020
Report: 9.11.2020

1.4. Measured products

Measured product was a variable acoustic wall panel made of MDF hardboard and Ewona polyester wool. Product was a rectangularly shaped enclosure with variably positioned plate inside the enclosure, forming a variable air gap with the back wall. Plate was driven by electronic motors and controlled remotely. The front panel featured 10 air holes, which were closed by triangle profiled bars attached on the plate, when set to the fully closed position. In fully open position the bars were fully inside the enclosure. Wool layers were placed on both sides of the plate. Outer surfaces of the enclosure were painted with a melamine paint.

Table 1 presents details of the tested products.

Table 1. Details of the tested products.

Product	Kaikua variable acoustic wall panel
Dimensions	1200 mm (height), 600 mm (width), 265 mm (depth)
Mass	45 kg
Material	MDF hardboard, Ewona polyester wool

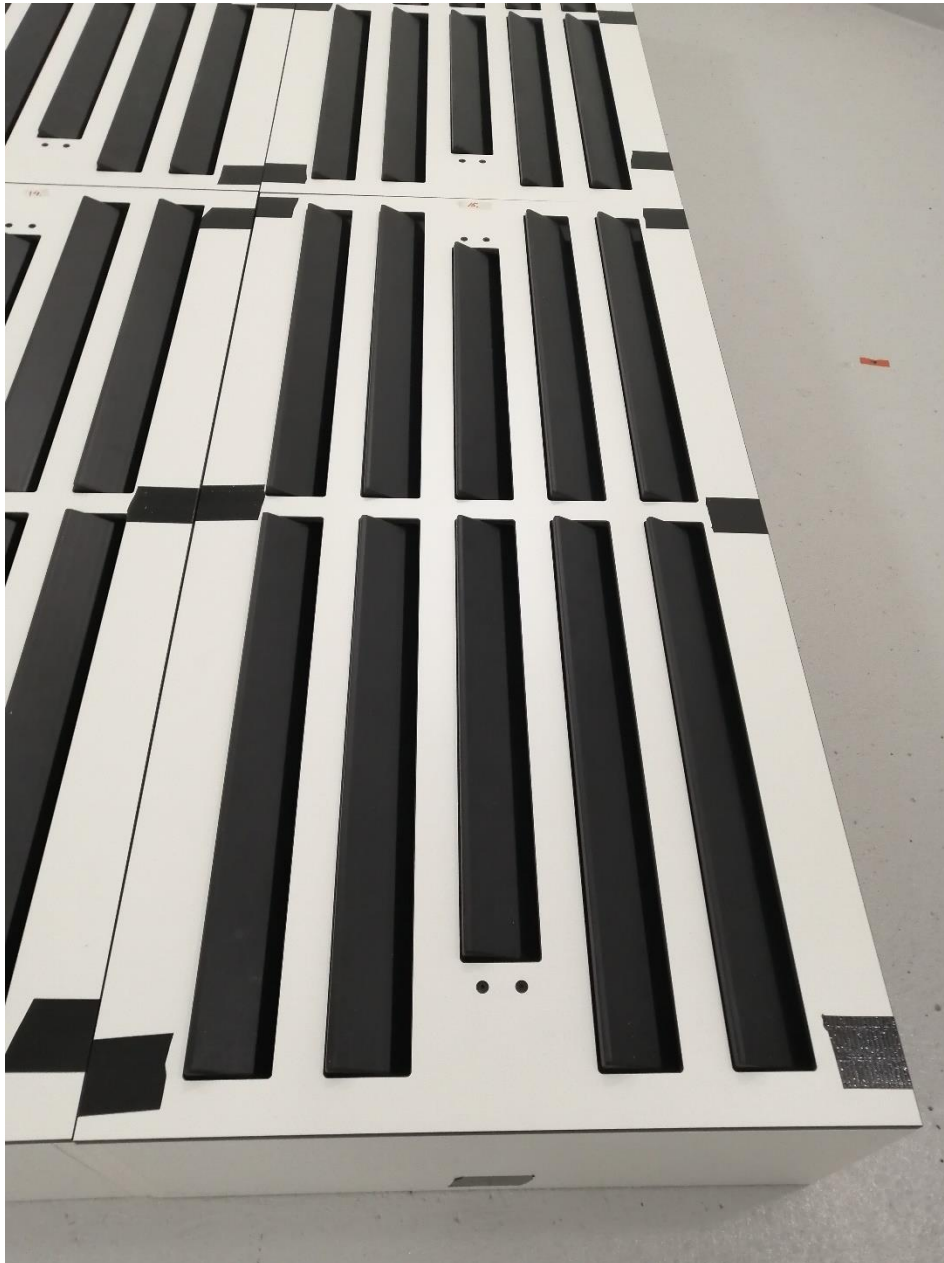


Figure 1. Measured product: KAIKUA variable acoustic wall panel.

1.5. Assignment and laboratory accreditation

The assignment was to measure the sound absorption of the supplied acoustic wall panel in several control positions according to standard SFS-EN ISO 354 [1] and to rate absorption classes according to standard SFS-EN ISO 11654 [2].

Zenner Engineers' acoustics and HVAC laboratory is a testing laboratory (no. T276) accredited by FINAS Finnish Accreditation Service, accreditation requirement SFS-EN ISO/IEC 17025:2005. Sound absorption measurements and rating of sound absorption in the frequency range of 100 Hz to 5000 Hz are included in the Zenner Engineers' laboratory accreditation.

1.6. Used instruments

Sinus Messtechnik Apollo Light – multichannel real-time analyser (4 channels)

Grant SQ 2040-4F16 – 32/16-channel datalogger

Gras 146AE – measurement microphones (3 pcs)

Gras 46AE – measurement microphones (1 pcs)

Brüel & Kjær 4231 – sound level calibrator

JBL EON612 – active full-range loudspeakers (2 pcs)

NTI MR-PRO – audio signal generator

Vaisala PTB110 – barometer (PI)

Vaisala HMW93D - temperature and humidity sensor (TI/MI)

Reverberation room ~141 m³

2. Measurement procedure

The sound absorption properties of the acoustic wall panels were measured according to standard SFS-EN ISO 354 [1]. Panels were mounted directly against a room surface (type A mounting).

The acoustic wall panels were installed in the reverberation room next to each other forming a unified rectangular area of 11,8 m² (side walls included). Front panel was facing the room. Several fixed sound diffusers (total area of 10 m², per one side) were installed and positioned randomly in the reverberation room.

Interrupted noise method was used for the excitation of the room, using pink noise for test signal. The reverberation times were calculated from 20 dB decay curves (T_{20}). Each measurement consisted of two simultaneous source positions with eight microphone positions. Three decay curves were measured in each position resulting in total of 24 reverberation times per measurement. Absorption coefficients α_{pi} and α_s were calculated from the measurement results according to standard.

Additionally, air temperature, air pressure and relative humidity were measured to define the effect of air absorption in the reverberation room.

3. Results

Summary of the sound absorption measurement results (practical absorption coefficient (α_{pi}) is presented in Table 2. Detailed results are given in Annex B. In certain measurements on the 80 Hz band, the sound absorption coefficient α_s (ratio of the equivalent sound absorption area) shows result larger than 1,0. This coefficient is evaluated from reverberation time measurements, and therefore can have results larger than 1,0. It should not be confused with the ratio of non-reflected-to-incident sound energy, which is always less than 1,0.

Results are valid only for the measured product.

Table 2. Summary of the practical and weighted sound absorption coefficients α_{pi} and α_w and sound absorption classes.

KAIKUA variable acoustic wall panel – sound absorption measurement results: all panels in the same position											
Ctrl. position [mm]	Ctrl. index	Sound absorption coefficient α_{pi}								Abs. coeff. α_w	Abs. class
		63 Hz*	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz*		
0	1023	0,80	0,45	0,35	0,20	0,15	0,10	0,10	0,10	0,15(L)	E
1	990	0,65	0,60	0,40	0,25	0,20	0,15	0,10	0,10	0,20(L)	E
2	976	0,55	0,70	0,45	0,30	0,20	0,10	0,10	0,10	0,20(L)	E
3	960	0,45	0,70	0,40	0,30	0,20	0,15	0,10	0,10	0,20(L)	E
4	945	0,40	0,65	0,45	0,35	0,20	0,15	0,10	0,10	0,20(L)	E
5	930	0,40	0,65	0,45	0,35	0,25	0,15	0,10	0,10	0,20(L)	E
6	915	0,40	0,65	0,45	0,35	0,25	0,15	0,10	0,15	0,20(L)	E
8	883	0,40	0,70	0,50	0,40	0,25	0,15	0,15	0,15	0,25(L)	E
16	786	0,35	0,55	0,55	0,45	0,30	0,20	0,20	0,20	0,30(L)	D
24	675	0,35	0,65	0,60	0,50	0,35	0,30	0,20	0,15	0,35(L)	D
32	570	0,30	0,60	0,55	0,50	0,40	0,30	0,20	0,20	0,35(L)	D
37	500	0,25	0,65	0,65	0,50	0,45	0,35	0,20	0,15	0,35(L)	D
47	360	0,20	0,55	0,60	0,55	0,50	0,45	0,25	0,20	0,45(L)	D
57	220	0,20	0,50	0,65	0,60	0,55	0,50	0,30	0,25	0,50(L)	D
65	110	0,20	0,55	0,70	0,60	0,60	0,50	0,30	0,25	0,50(L)	D
69	55	0,15	0,50	0,70	0,65	0,60	0,50	0,30	0,25	0,50(L)	D
72	0	0,20	0,50	0,70	0,60	0,60	0,50	0,30	0,30	0,50(L)	D
Fully open and closed panels combined											
Configuration	Panels open/closed	Sound absorption coefficient α_{pi}								Abs. coeff. α_w	Abs. class
		63 Hz*	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz*		
sawtooth	7/7	0,55	0,50	0,55	0,45	0,40	0,30	0,20	0,20	0,35(L)	D
lines	7/7	0,45	0,50	0,60	0,45	0,35	0,30	0,20	0,20	0,35(L)	D
columns	6/8	0,60	0,55	0,55	0,40	0,35	0,30	0,20	0,20	0,35(L)	D

*Not included in the scope of laboratory accreditation.

4. Evaluation of the results and measurement uncertainty

The absorption area of the reverberation room meets the requirement in SFS-EN ISO 354. However, the volume is smaller than the standard requirement 150 m³. Therefore, the measurement uncertainty in the range from 50 Hz to 160 Hz can be slightly higher than estimated in the standard. Table 3 presents the estimated measurement uncertainty in the sound absorption measurements of the building insulation products.

Table 3. Estimated uncertainty in the sound absorption measurements.

Estimated measurement uncertainty			
Absorption coefficient α_s [-]	63 Hz – 315 Hz	400 Hz – 2000 Hz	2500 Hz – 10000 Hz
	± 0,10	± 0,03	± 0,01

ZENNER ENGINEERS

Johannes Usano

Tapio Sintonen

References

- [1] SFS-EN ISO 354:2003(E). Acoustics - Measurement of sound absorption in a reverberation room.
- [2] SFS-EN ISO 11654. Acoustics - Sound absorbers for use in buildings – Rating of sound absorption.

Annexes

- Annex A Measurement principle and installation type.
- Annex B Detailed measurement results.

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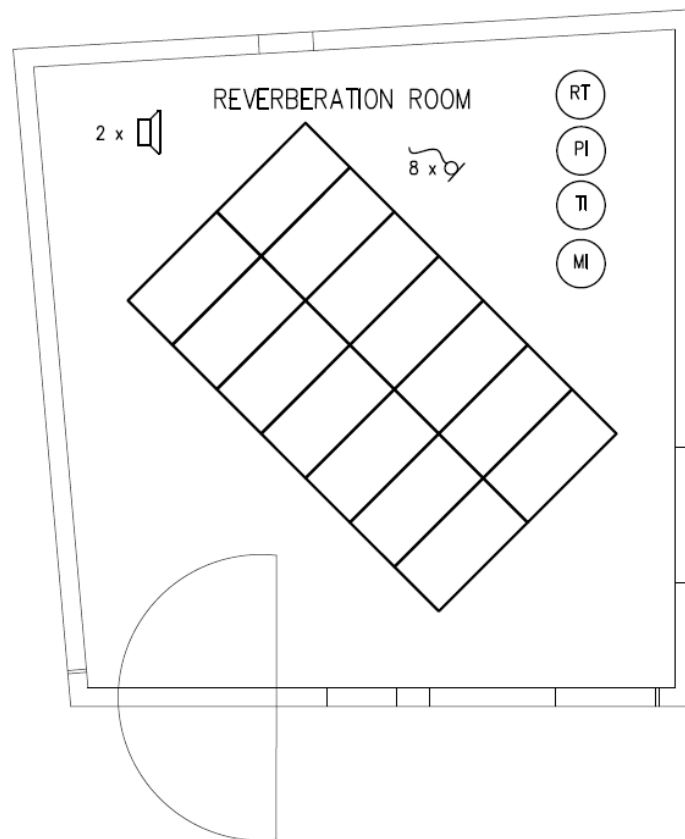
Annex A: Measurement principle and installation type.

Figure A-1. Layout of the reverberation room during sound absorption measurements.

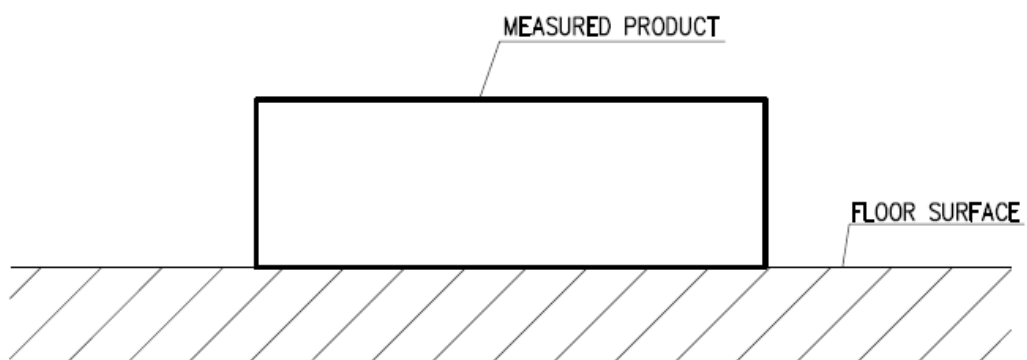


Figure A-2. Mounting principle of the tested products during the measurements.



Annex B: Detailed measurement results



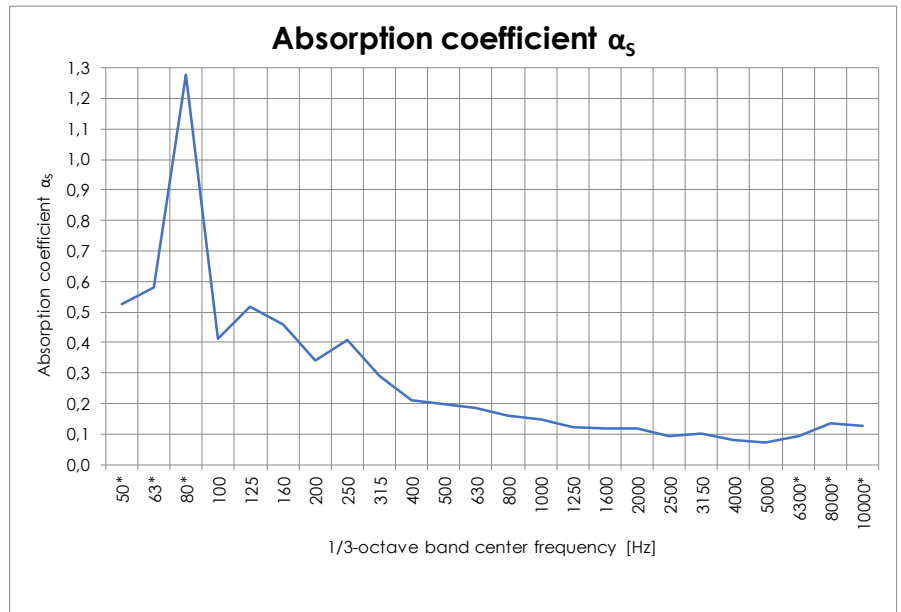
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	0 mm open, fully reflective	Project ID:	3436-1-1
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,2 °C 48 %RH 1004 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

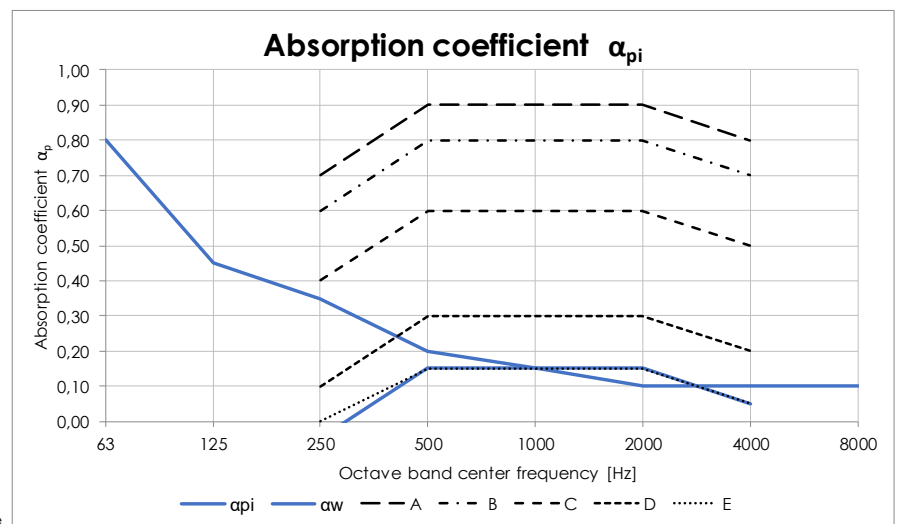


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	2,22	0,53
63*	5,81	2,07	0,58
80*	5,27	1,15	1,28**
100	4,99	2,36	0,41
125	6,25	2,29	0,52
160	6,76	2,53	0,46
200	6,59	2,97	0,34
250	5,44	2,47	0,41
315	5,68	3,00	0,29
400	6,11	3,61	0,21
500	5,97	3,62	0,20
630	6,04	3,77	0,18
800	5,23	3,60	0,16
1000	5,19	3,67	0,15
1250	4,45	3,41	0,12
1600	3,86	3,05	0,12
2000	3,78	3,00	0,12
2500	3,29	2,75	0,10
3150	3,11	2,58	0,10
4000	2,78	2,36	0,08
5000	2,24	1,94	0,07
6300*	1,73	1,48	0,09
8000*	1,32	1,11	0,14
10000*	0,98	0,84	0,13



1/1 oct. [Hz]	α _{pi}
63*	0,80
125	0,45
250	0,35
500	0,20
1000	0,15
2000	0,10
4000	0,10
8000*	0,10

Absorption coefficient α _w	Absorption class
0,15(L)	E



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

ver. 1.2

* Not included in the scope of accreditation

** Result is evaluated from reverberation time measurements, and can have values larger than 1,0.



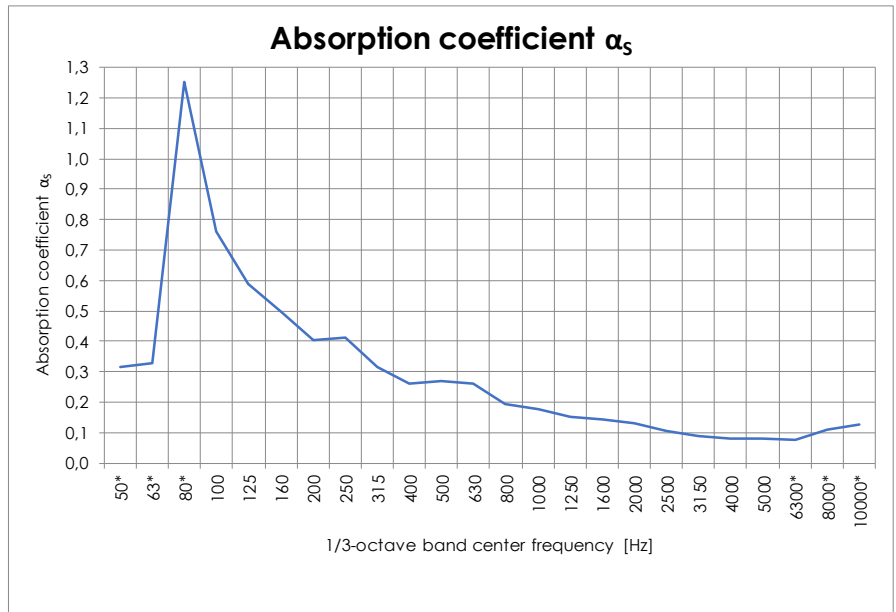
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	1 mm open	Project ID:	3436-1-2
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,2 °C 48 %RH 1005 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

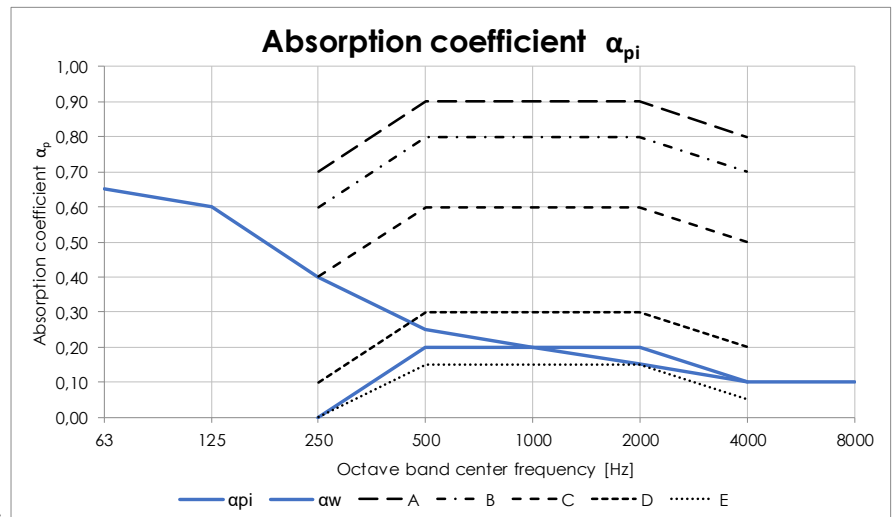


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	2,95	0,32
63*	5,81	2,87	0,33
80*	5,27	1,17	1,25**
100	4,99	1,65	0,76
125	6,25	2,10	0,59
160	6,76	2,41	0,50
200	6,59	2,71	0,40
250	5,44	2,46	0,41
315	5,68	2,88	0,32
400	6,11	3,29	0,26
500	5,97	3,20	0,27
630	6,04	3,27	0,26
800	5,23	3,36	0,20
1000	5,19	3,45	0,18
1250	4,45	3,24	0,15
1600	3,86	2,94	0,14
2000	3,78	2,94	0,13
2500	3,29	2,71	0,11
3150	3,11	2,62	0,09
4000	2,78	2,37	0,08
5000	2,24	1,92	0,08
6300*	1,73	1,51	0,08
8000*	1,32	1,13	0,11
10000*	0,98	0,84	0,13



1/1 oct. [Hz]	α _{pi}
63*	0,65
125	0,60
250	0,40
500	0,25
1000	0,20
2000	0,15
4000	0,10
8000*	0,10

Absorption coefficient α _w	Absorption class
0,20(L)	E



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

ver. 1.2

* Not included in the scope of accreditation

** Result is evaluated from reverberation time measurements, and can have values larger than 1,0.



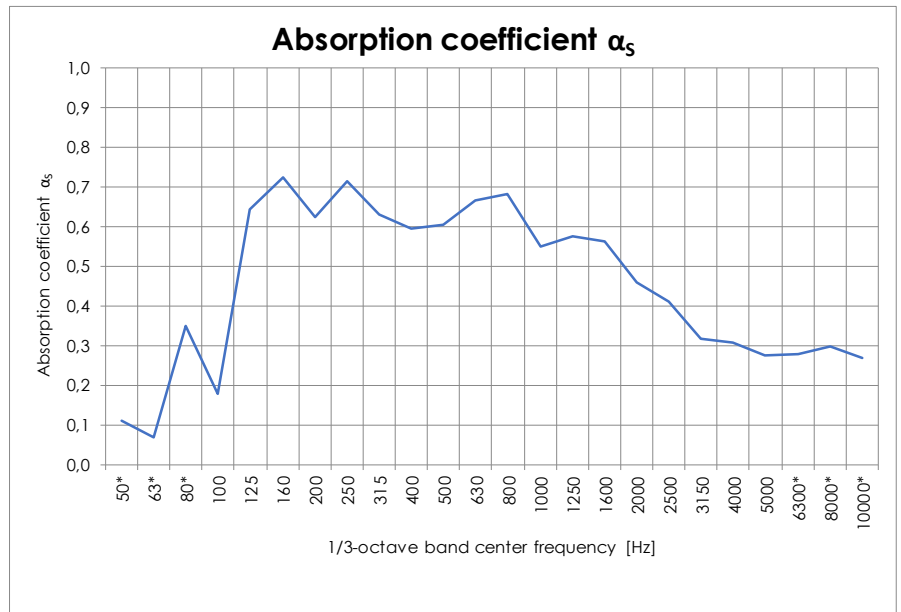
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	72 mm open, fully absorptive	Project ID:	3436-1-3
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,2 °C 48 %RH 1005 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

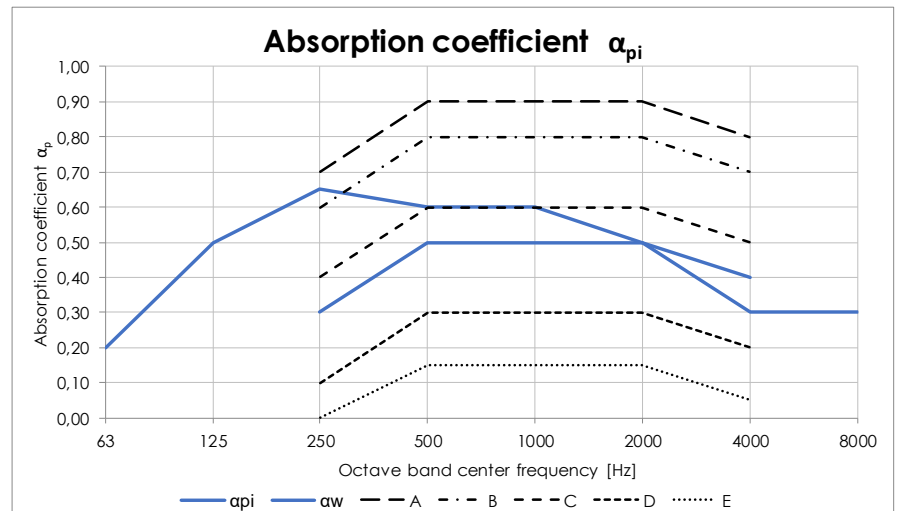


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	4,36	0,11
63*	5,81	4,71	0,07
80*	5,27	2,65	0,35
100	4,99	3,34	0,18
125	6,25	1,98	0,64
160	6,76	1,87	0,73
200	6,59	2,06	0,62
250	5,44	1,77	0,72
315	5,68	1,95	0,63
400	6,11	2,08	0,59
500	5,97	2,04	0,61
630	6,04	1,92	0,67
800	5,23	1,81	0,68
1000	5,19	2,05	0,55
1250	4,45	1,88	0,57
1600	3,86	1,78	0,56
2000	3,78	1,95	0,46
2500	3,29	1,88	0,41
3150	3,11	2,00	0,32
4000	2,78	1,84	0,31
5000	2,24	1,61	0,28
6300*	1,73	1,30	0,28
8000*	1,32	1,02	0,30
10000*	0,98	0,80	0,27



1/1 oct. [Hz]	α _{pi}
63*	0,20
125	0,50
250	0,65
500	0,60
1000	0,60
2000	0,50
4000	0,30
8000*	0,30

Absorption coefficient α _w	Absorption class
0,50(L)	D



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

* Not included in the scope of accreditation

ver. 1.2



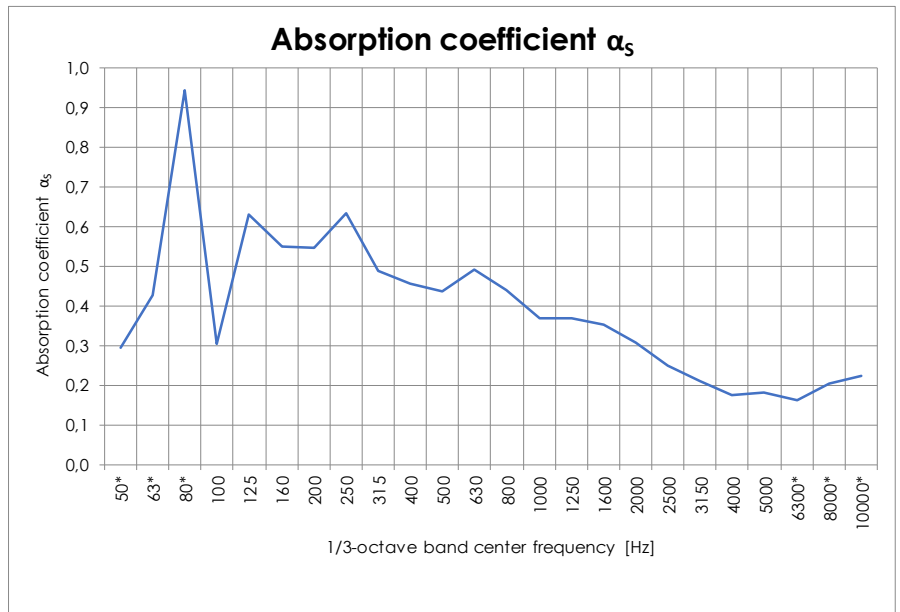
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer: Idea-Puu Oy Date: 28.10.2020
 Tested product: KAIKUA variable acoustic wall panel
 Control position: Panels fully open/closed (7/7), sawtooth Engineer: TS
 Product surface area: 11,83 m² 14 pcs
 Mounting of product: directly against the room surface Project ID: 3436-1-4
 Empty room conditions: 21,3 °C 54 %RH 1005 hPa
 Conditions during the test: 21,2 °C 48 %RH 1005 hPa
 Room volume / surf. area: 141,3 m³ / 166,1 m²

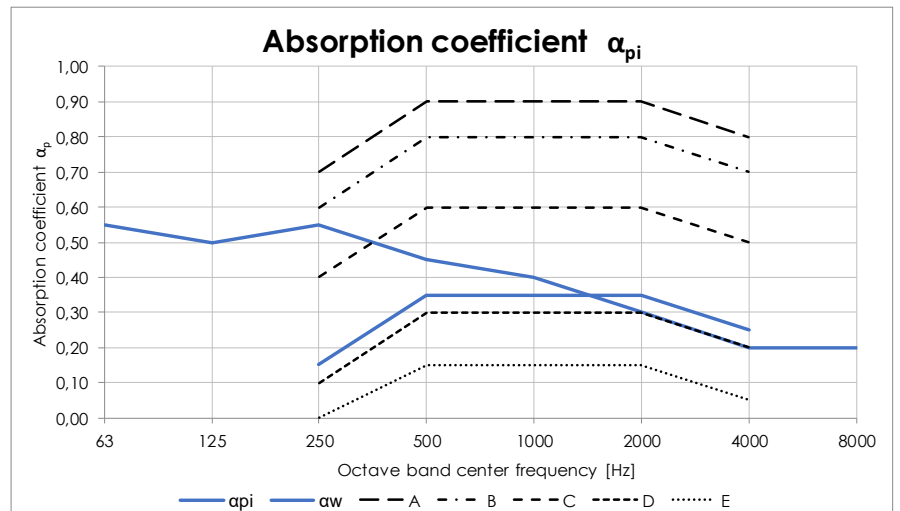


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	3,06	0,30
63*	5,81	2,50	0,43
80*	5,27	1,44	0,94
100	4,99	2,74	0,30
125	6,25	2,01	0,63
160	6,76	2,27	0,55
200	6,59	2,25	0,55
250	5,44	1,92	0,63
315	5,68	2,28	0,49
400	6,11	2,45	0,46
500	5,97	2,50	0,44
630	6,04	2,33	0,49
800	5,23	2,35	0,44
1000	5,19	2,56	0,37
1250	4,45	2,37	0,37
1600	3,86	2,22	0,35
2000	3,78	2,31	0,31
2500	3,29	2,25	0,25
3150	3,11	2,24	0,21
4000	2,78	2,11	0,18
5000	2,24	1,75	0,18
6300*	1,73	1,41	0,16
8000*	1,32	1,07	0,20
10000*	0,98	0,81	0,22



1/1 oct. [Hz]	α _{pi}
63*	0,55
125	0,50
250	0,55
500	0,45
1000	0,40
2000	0,30
4000	0,20
8000*	0,20

Absorption coefficient α _w	Absorption class
0,35(L)	D



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

* Not included in the scope of accreditation



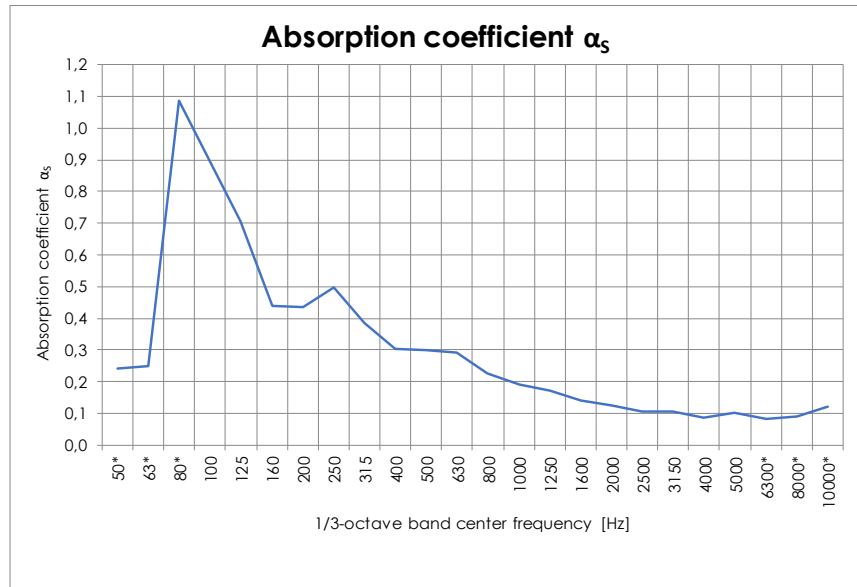
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAUKUA variable acoustic wall panel	Engineer:	TS
Control position:	2 mm open	Project ID:	3436-1-5
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,2 °C 49 %RH 1005 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

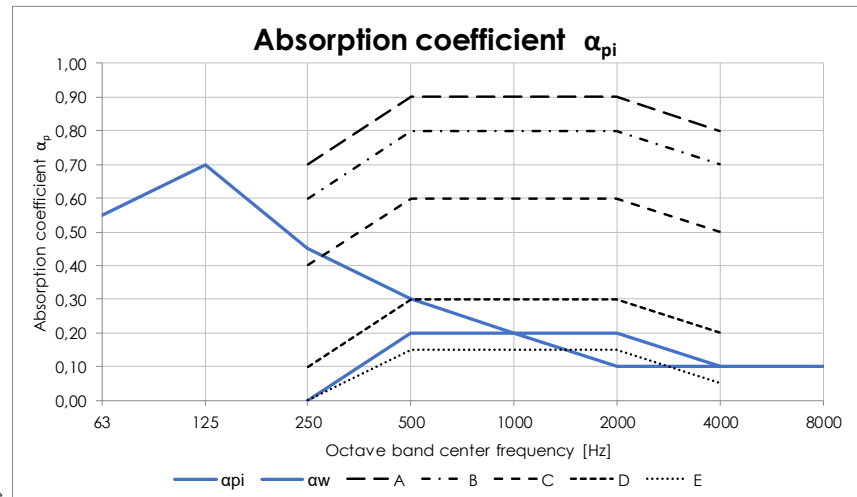


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	3,35	0,24
63*	5,81	3,26	0,25
80*	5,27	1,30	1,09**
100	4,99	1,47	0,90
125	6,25	1,86	0,71
160	6,76	2,62	0,44
200	6,59	2,59	0,44
250	5,44	2,22	0,50
315	5,68	2,61	0,38
400	6,11	3,06	0,30
500	5,97	3,05	0,30
630	6,04	3,11	0,29
800	5,23	3,19	0,23
1000	5,19	3,38	0,19
1250	4,45	3,14	0,17
1600	3,86	2,96	0,14
2000	3,78	2,97	0,13
2500	3,29	2,72	0,11
3150	3,11	2,57	0,11
4000	2,78	2,37	0,08
5000	2,24	1,90	0,10
6300*	1,73	1,52	0,08
8000*	1,32	1,16	0,09
10000*	0,98	0,86	0,12



1/1 oct. [Hz]	α _{pi}
63*	0,55
125	0,70
250	0,45
500	0,30
1000	0,20
2000	0,10
4000	0,10
8000*	0,10

Absorption coefficient α _w	Absorption class
0,20(L)	E



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

ver. 1.2

* Not included in the scope of accreditation

** Result is evaluated from reverberation time measurements, and can have values larger than 1,0.



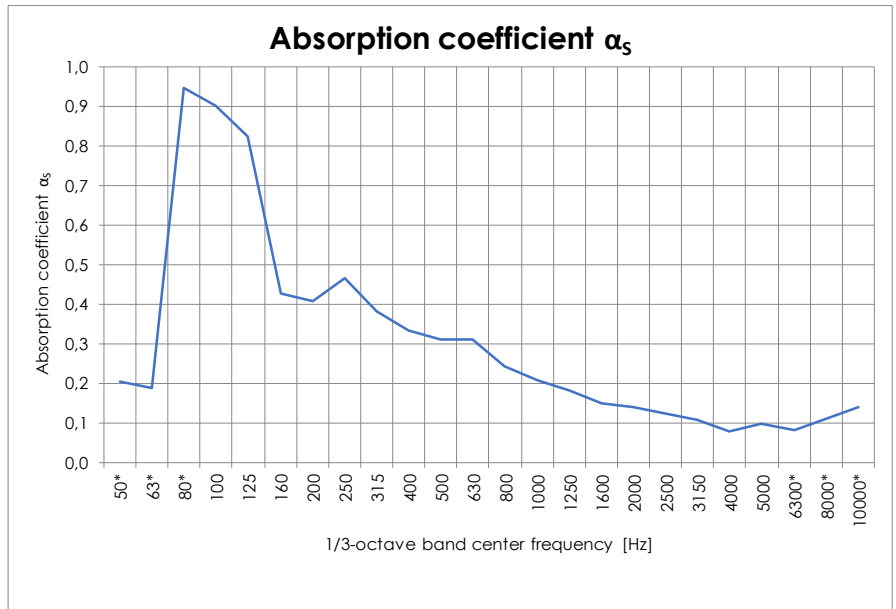
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	3 mm open	Project ID:	3436-1-6
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,2 °C 49 %RH 1006 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

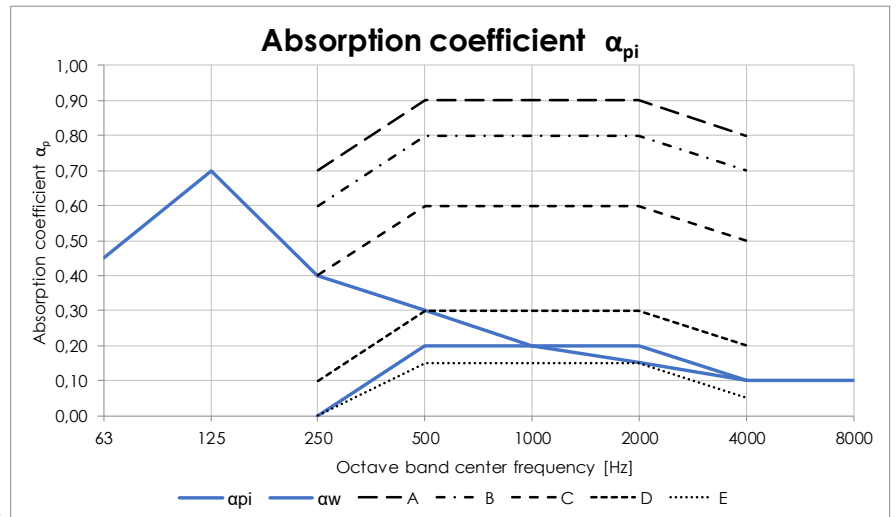


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	3,59	0,21
63*	5,81	3,64	0,19
80*	5,27	1,44	0,95
100	4,99	1,47	0,90
125	6,25	1,67	0,82
160	6,76	2,65	0,43
200	6,59	2,70	0,41
250	5,44	2,30	0,47
315	5,68	2,62	0,38
400	6,11	2,91	0,33
500	5,97	2,99	0,31
630	6,04	3,00	0,31
800	5,23	3,11	0,24
1000	5,19	3,28	0,21
1250	4,45	3,08	0,18
1600	3,86	2,92	0,15
2000	3,78	2,90	0,14
2500	3,29	2,65	0,12
3150	3,11	2,57	0,11
4000	2,78	2,39	0,08
5000	2,24	1,92	0,10
6300*	1,73	1,52	0,08
8000*	1,32	1,15	0,11
10000*	0,98	0,85	0,14



1/1 oct. [Hz]	α _{pi}
63*	0,45
125	0,70
250	0,40
500	0,30
1000	0,20
2000	0,15
4000	0,10
8000*	0,10

Absorption coefficient α _w	Absorption class
0,20(L)	E



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

* Not included in the scope of accreditation

ver. 1.2



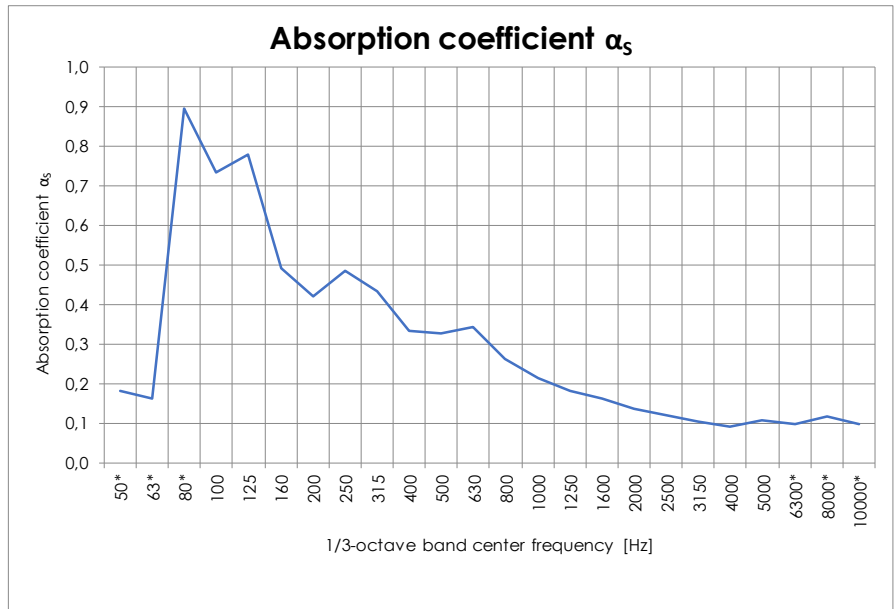
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	4 mm open	Project ID:	3436-1-7
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,2 °C 49 %RH 1007 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

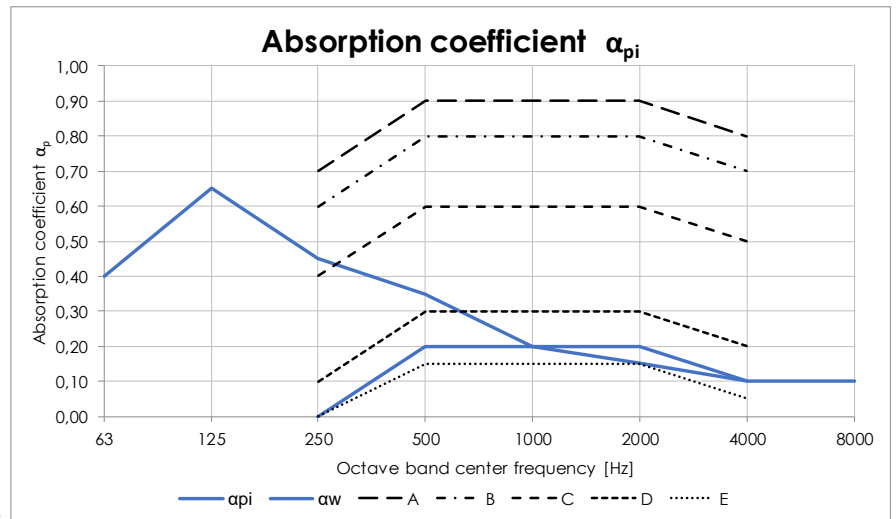


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	3,76	0,18
63*	5,81	3,84	0,16
80*	5,27	1,50	0,90
100	4,99	1,69	0,74
125	6,25	1,74	0,78
160	6,76	2,43	0,49
200	6,59	2,65	0,42
250	5,44	2,25	0,49
315	5,68	2,45	0,43
400	6,11	2,91	0,33
500	5,97	2,91	0,33
630	6,04	2,86	0,34
800	5,23	3,01	0,26
1000	5,19	3,25	0,21
1250	4,45	3,09	0,18
1600	3,86	2,85	0,16
2000	3,78	2,91	0,14
2500	3,29	2,67	0,12
3150	3,11	2,58	0,10
4000	2,78	2,35	0,09
5000	2,24	1,89	0,11
6300*	1,73	1,50	0,10
8000*	1,32	1,14	0,12
10000*	0,98	0,87	0,10



1/1 oct. [Hz]	α _{pi}
63*	0,40
125	0,65
250	0,45
500	0,35
1000	0,20
2000	0,15
4000	0,10
8000*	0,10

Absorption coefficient α _w	Absorption class
0,20(L)	E



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

ver. 1.2

* Not included in the scope of accreditation



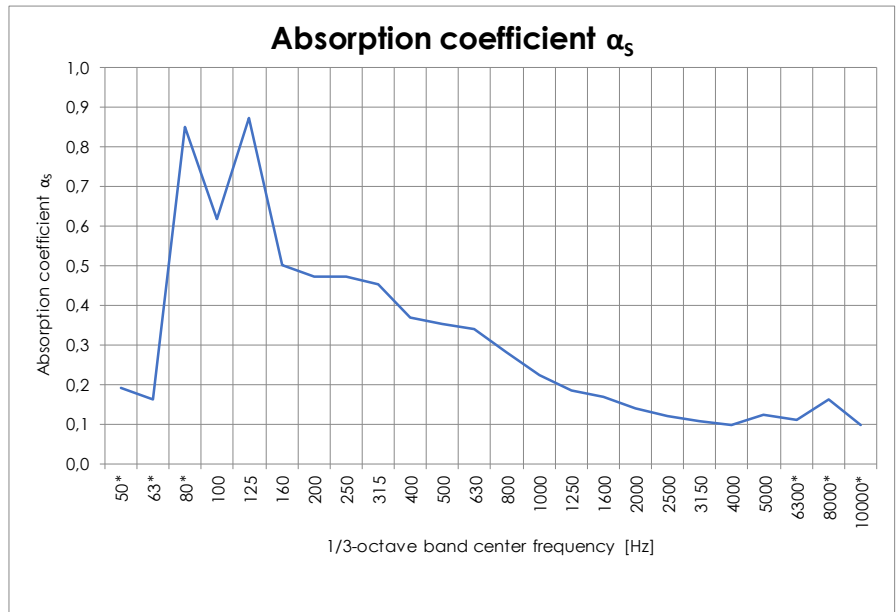
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	5 mm open	Project ID:	3436-1-8
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,2 °C 49 %RH 1006 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

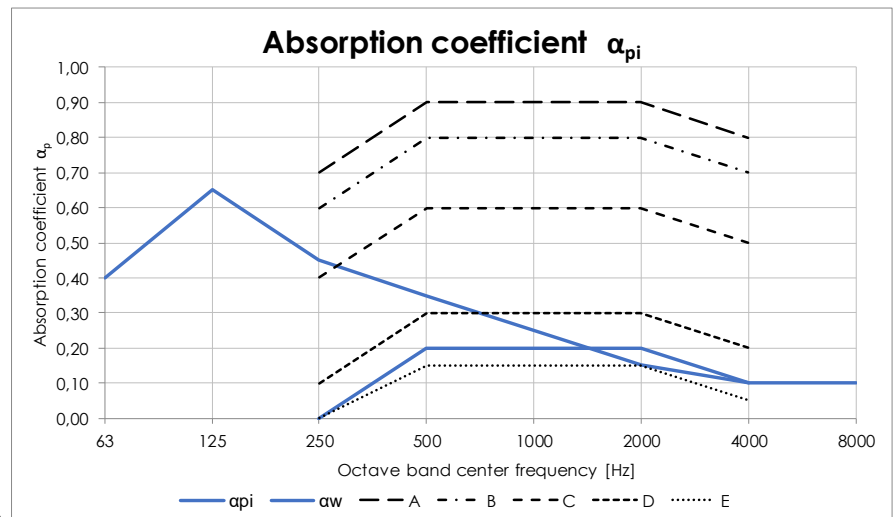


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	3,68	0,19
63*	5,81	3,83	0,16
80*	5,27	1,55	0,85
100	4,99	1,88	0,62
125	6,25	1,60	0,87
160	6,76	2,40	0,50
200	6,59	2,47	0,47
250	5,44	2,29	0,47
315	5,68	2,39	0,45
400	6,11	2,77	0,37
500	5,97	2,81	0,35
630	6,04	2,88	0,34
800	5,23	2,92	0,28
1000	5,19	3,19	0,22
1250	4,45	3,08	0,18
1600	3,86	2,83	0,17
2000	3,78	2,90	0,14
2500	3,29	2,66	0,12
3150	3,11	2,57	0,11
4000	2,78	2,33	0,10
5000	2,24	1,87	0,12
6300*	1,73	1,49	0,11
8000*	1,32	1,11	0,16
10000*	0,98	0,87	0,10



1/1 oct. [Hz]	α _{pi}
63*	0,40
125	0,65
250	0,45
500	0,35
1000	0,25
2000	0,15
4000	0,10
8000*	0,10

Absorption coefficient α _w	Absorption class
0,20(L)	E



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

* Not included in the scope of accreditation

ver. 1.2



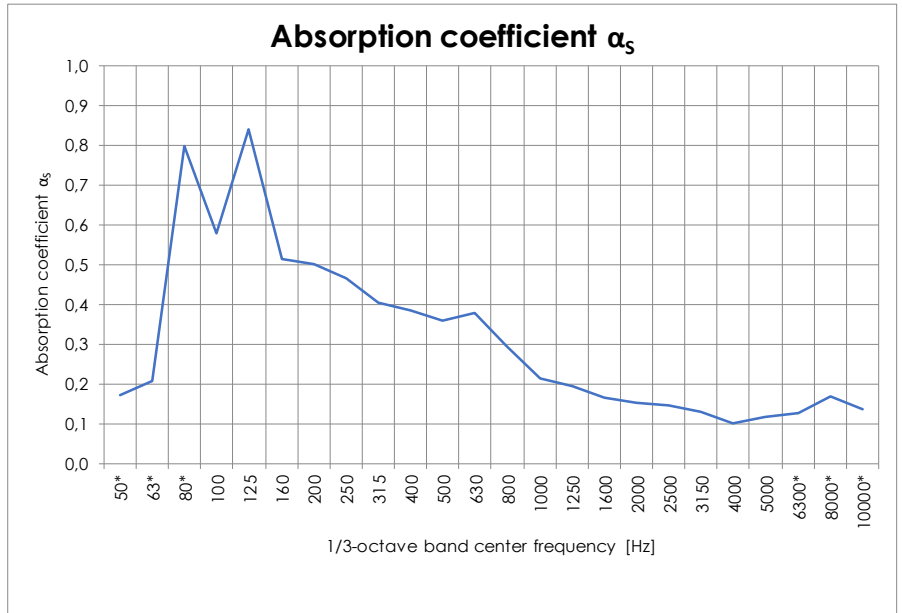
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	6 mm open	Project ID:	3436-1-9
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,2 °C 49 %RH 1007 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

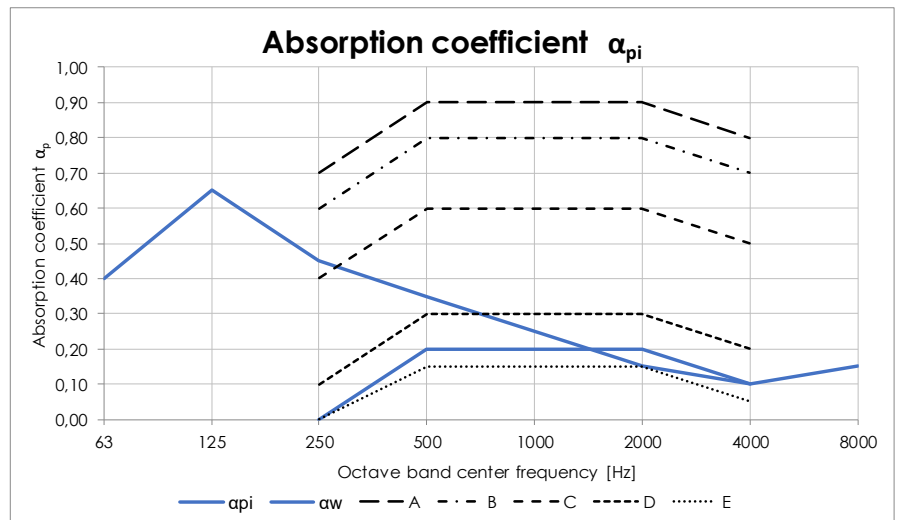


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	3,83	0,17
63*	5,81	3,50	0,21
80*	5,27	1,62	0,80
100	4,99	1,96	0,58
125	6,25	1,65	0,84
160	6,76	2,36	0,52
200	6,59	2,38	0,50
250	5,44	2,30	0,47
315	5,68	2,54	0,40
400	6,11	2,70	0,39
500	5,97	2,77	0,36
630	6,04	2,72	0,38
800	5,23	2,86	0,30
1000	5,19	3,24	0,21
1250	4,45	3,02	0,20
1600	3,86	2,85	0,16
2000	3,78	2,84	0,15
2500	3,29	2,58	0,14
3150	3,11	2,50	0,13
4000	2,78	2,33	0,10
5000	2,24	1,88	0,12
6300*	1,73	1,47	0,13
8000*	1,32	1,11	0,17
10000*	0,98	0,86	0,13



1/1 oct. [Hz]	α _{pi}
63*	0,40
125	0,65
250	0,45
500	0,35
1000	0,25
2000	0,15
4000	0,10
8000*	0,15

Absorption coefficient α _w	Absorption class
0,20(L)	E



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

* Not included in the scope of accreditation



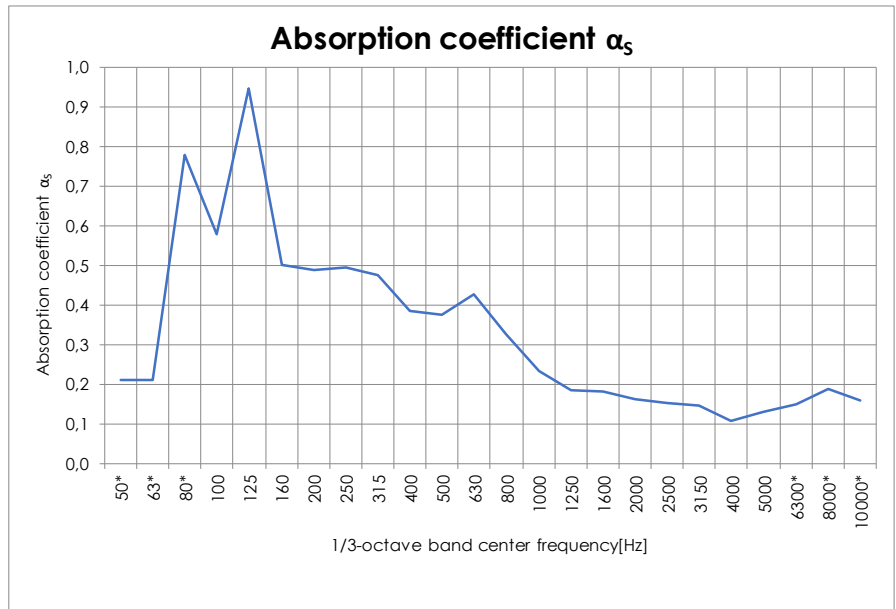
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer: Idea-Puu Oy Date: 28.10.2020
 Tested product: KAIKUA variable acoustic wall panel
 Control position: 8 mm open Engineer: TS
 Product surface area: 11,83 m² 14 pcs
 Mounting of product: directly against the room surface Project ID: 3436-1-10
 Empty room conditions: 21,3 °C 54 %RH 1005 hPa
 Conditions during the test: 21,2 °C 49 %RH 1007 hPa
 Room volume / surf. area: 141,3 m³ / 166,1 m²

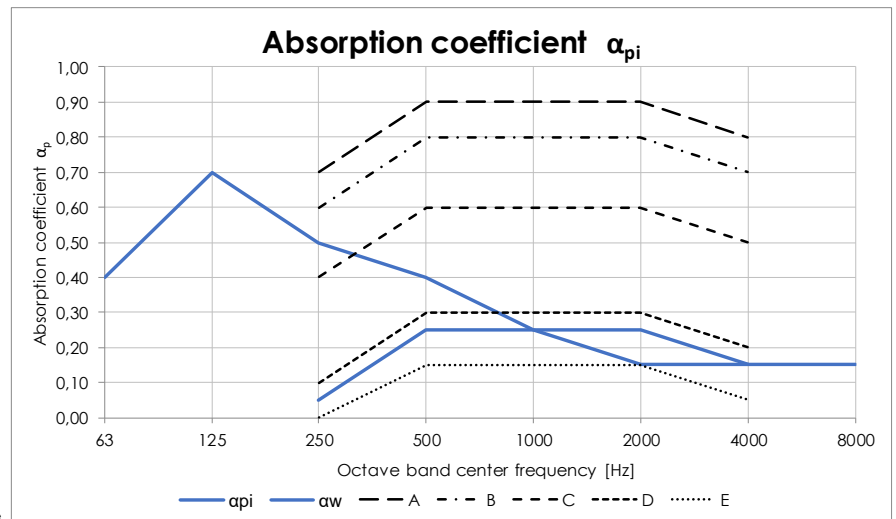


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	3,56	0,21
63*	5,81	3,49	0,21
80*	5,27	1,65	0,78
100	4,99	1,96	0,58
125	6,25	1,51	0,95
160	6,76	2,41	0,50
200	6,59	2,42	0,49
250	5,44	2,22	0,50
315	5,68	2,32	0,48
400	6,11	2,70	0,38
500	5,97	2,71	0,38
630	6,04	2,54	0,43
800	5,23	2,73	0,33
1000	5,19	3,14	0,23
1250	4,45	3,07	0,19
1600	3,86	2,78	0,18
2000	3,78	2,81	0,16
2500	3,29	2,55	0,15
3150	3,11	2,45	0,15
4000	2,78	2,31	0,11
5000	2,24	1,86	0,13
6300*	1,73	1,45	0,15
8000*	1,32	1,10	0,19
10000*	0,98	0,85	0,16



1/1 oct. [Hz]	α _{pi}
63*	0,40
125	0,70
250	0,50
500	0,40
1000	0,25
2000	0,15
4000	0,15
8000*	0,15

Absorption coefficient α _w	Absorption class
0,25(L)	E



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

* Not included in the scope of accreditation



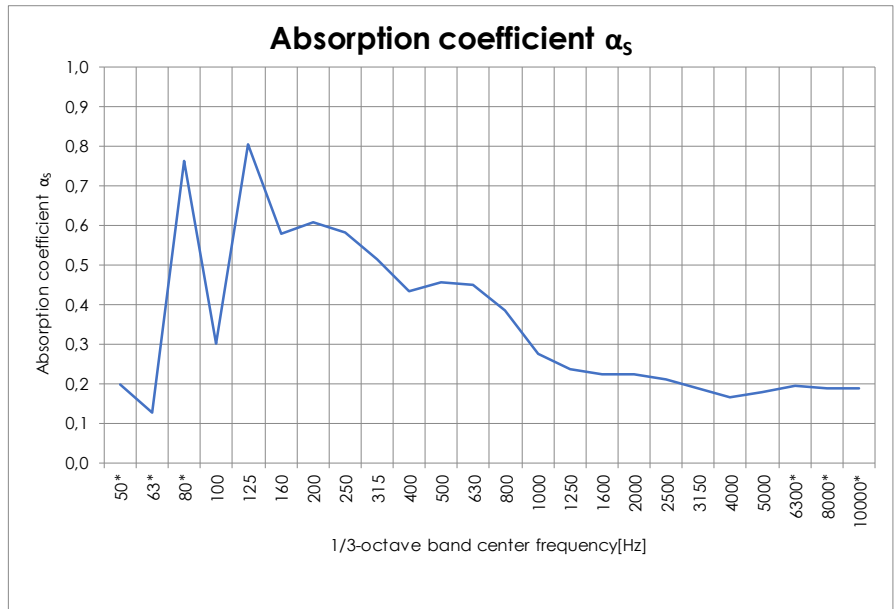
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer: Idea-Puu Oy Date: 28.10.2020
 Tested product: KAIKUA variable acoustic wall panel
 Control position: 16 mm open Engineer: TS
 Product surface area: 11,83 m² 14 pcs
 Mounting of product: directly against the room surface Project ID: 3436-1-11
 Empty room conditions: 21,3 °C 54 %RH 1005 hPa
 Conditions during the test: 21,3 °C 50 %RH 1007 hPa
 Room volume / surf. area: 141,3 m³ / 166,1 m²

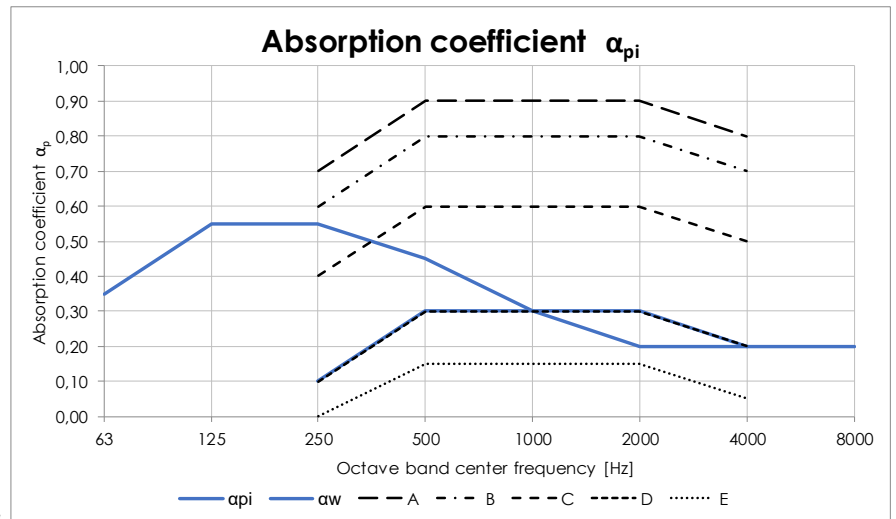


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	3,64	0,20
63*	5,81	4,12	0,13
80*	5,27	1,68	0,76
100	4,99	2,75	0,30
125	6,25	1,70	0,81
160	6,76	2,19	0,58
200	6,59	2,10	0,61
250	5,44	2,02	0,58
315	5,68	2,21	0,51
400	6,11	2,52	0,44
500	5,97	2,43	0,46
630	6,04	2,46	0,45
800	5,23	2,52	0,38
1000	5,19	2,94	0,27
1250	4,45	2,83	0,24
1600	3,86	2,61	0,22
2000	3,78	2,57	0,22
2500	3,29	2,36	0,21
3150	3,11	2,32	0,19
4000	2,78	2,16	0,16
5000	2,24	1,78	0,18
6300*	1,73	1,40	0,19
8000*	1,32	1,10	0,19
10000*	0,98	0,84	0,19



1/1 oct. [Hz]	α _{pi}
63*	0,35
125	0,55
250	0,55
500	0,45
1000	0,30
2000	0,20
4000	0,20
8000*	0,20

Absorption coefficient α _w	Absorption class
0,30(L)	D



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

ver. 1.2

* Not included in the scope of accreditation



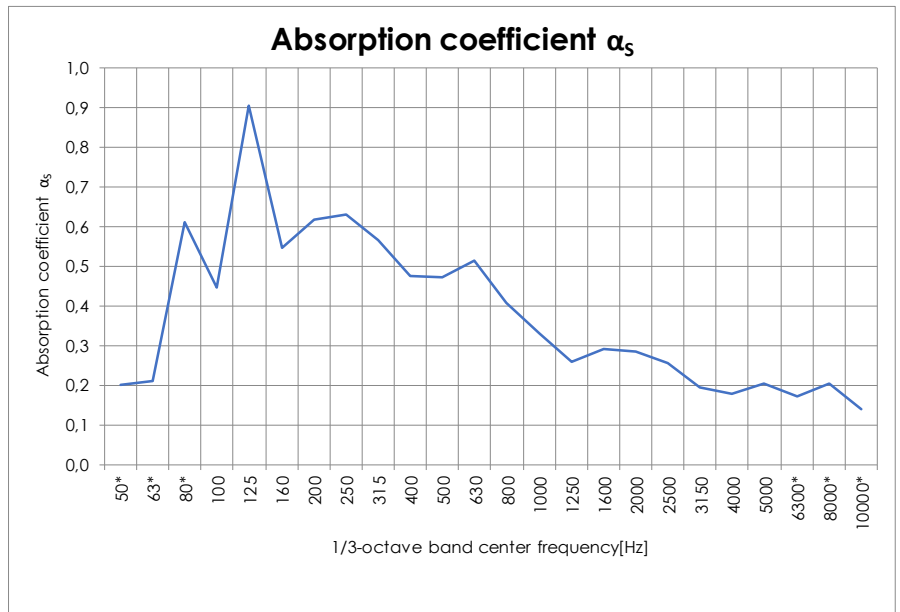
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	24 mm open	Project ID:	3436-1-12
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,3 °C 49 %RH 1007 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

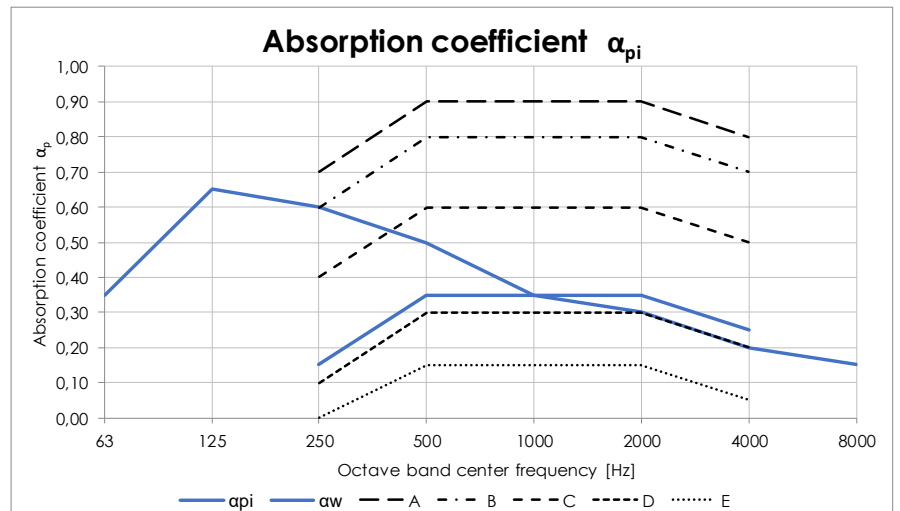


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	3,62	0,20
63*	5,81	3,49	0,21
80*	5,27	1,93	0,61
100	4,99	2,27	0,45
125	6,25	1,56	0,90
160	6,76	2,27	0,55
200	6,59	2,08	0,62
250	5,44	1,92	0,63
315	5,68	2,08	0,57
400	6,11	2,39	0,47
500	5,97	2,38	0,47
630	6,04	2,27	0,51
800	5,23	2,44	0,41
1000	5,19	2,71	0,33
1250	4,45	2,75	0,26
1600	3,86	2,39	0,29
2000	3,78	2,37	0,29
2500	3,29	2,23	0,26
3150	3,11	2,30	0,19
4000	2,78	2,12	0,18
5000	2,24	1,73	0,20
6300*	1,73	1,42	0,17
8000*	1,32	1,09	0,20
10000*	0,98	0,86	0,14



1/1 oct. [Hz]	α _{pi}
63*	0,35
125	0,65
250	0,60
500	0,50
1000	0,35
2000	0,30
4000	0,20
8000*	0,15

Absorption coefficient α _w	Absorption class
0,35(L)	D



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

* Not included in the scope of accreditation



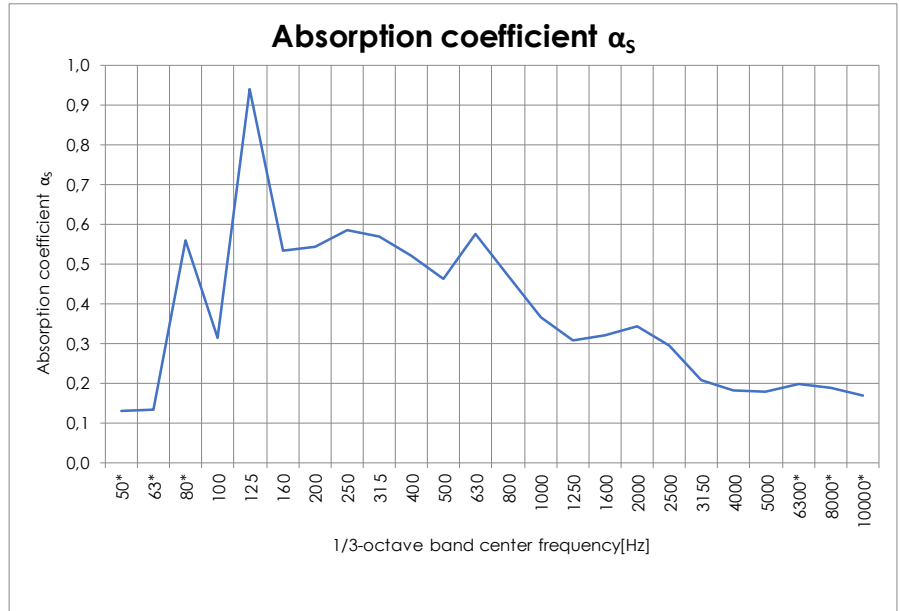
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	32 mm open	Project ID:	3436-1-13
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,3 °C 50 %RH 1007 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

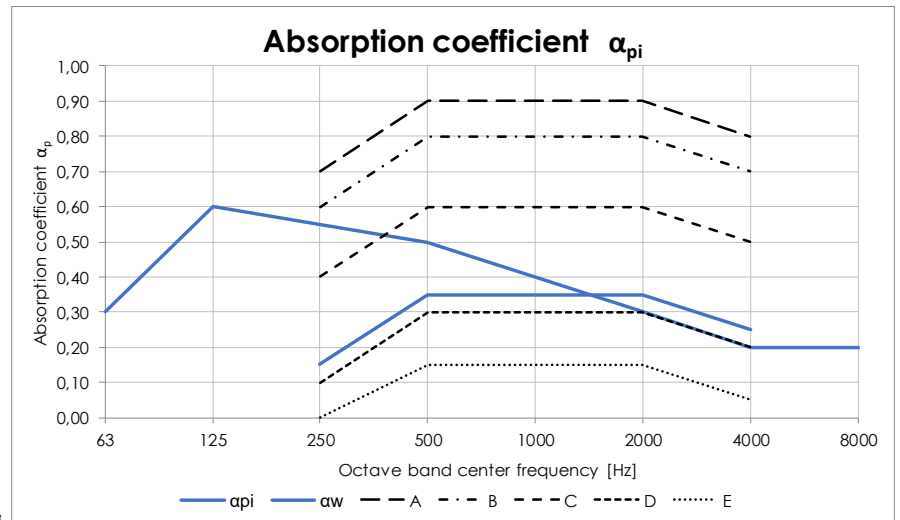


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	4,17	0,13
63*	5,81	4,06	0,13
80*	5,27	2,04	0,56
100	4,99	2,70	0,32
125	6,25	1,51	0,94
160	6,76	2,31	0,53
200	6,59	2,26	0,54
250	5,44	2,01	0,58
315	5,68	2,08	0,57
400	6,11	2,26	0,52
500	5,97	2,41	0,46
630	6,04	2,12	0,57
800	5,23	2,26	0,47
1000	5,19	2,57	0,37
1250	4,45	2,56	0,31
1600	3,86	2,30	0,32
2000	3,78	2,21	0,34
2500	3,29	2,14	0,30
3150	3,11	2,26	0,21
4000	2,78	2,12	0,18
5000	2,24	1,78	0,18
6300*	1,73	1,40	0,20
8000*	1,32	1,10	0,19
10000*	0,98	0,85	0,17



1/1 oct. [Hz]	α _{pi}
63*	0,30
125	0,60
250	0,55
500	0,50
1000	0,40
2000	0,30
4000	0,20
8000*	0,20

Absorption coefficient α _w	Absorption class
0,35(L)	D



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

* Not included in the scope of accreditation



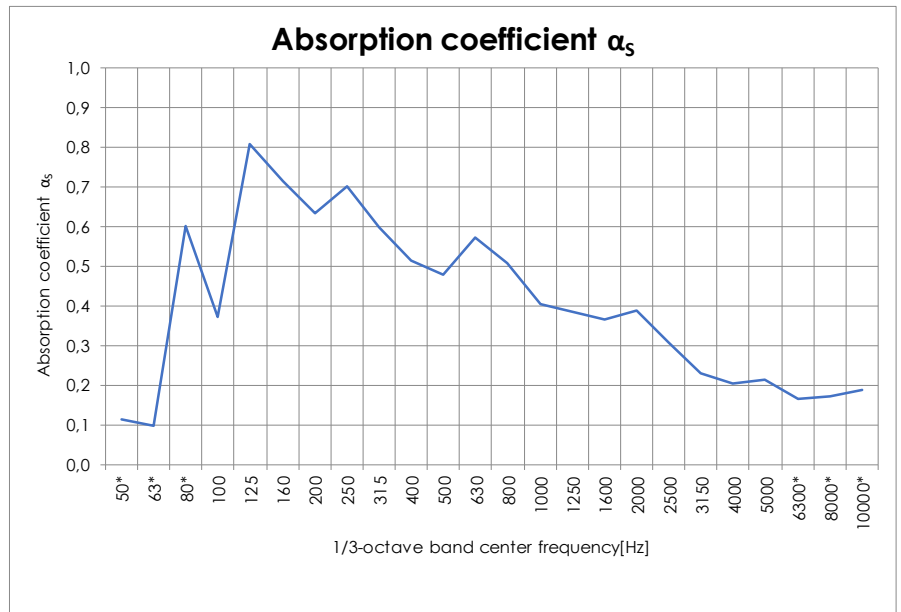
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	37 mm open	Project ID:	3436-1-14
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,3 °C 49 %RH 1007 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

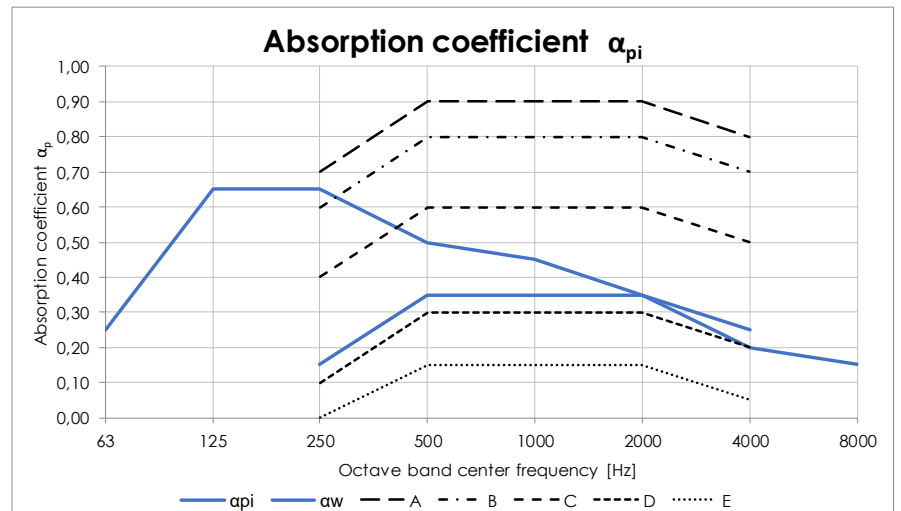


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	4,34	0,11
63*	5,81	4,39	0,10
80*	5,27	1,95	0,60
100	4,99	2,50	0,37
125	6,25	1,69	0,81
160	6,76	1,89	0,71
200	6,59	2,04	0,64
250	5,44	1,79	0,70
315	5,68	2,01	0,60
400	6,11	2,28	0,51
500	5,97	2,36	0,48
630	6,04	2,12	0,57
800	5,23	2,17	0,51
1000	5,19	2,44	0,40
1250	4,45	2,32	0,38
1600	3,86	2,18	0,37
2000	3,78	2,10	0,39
2500	3,29	2,11	0,31
3150	3,11	2,20	0,23
4000	2,78	2,06	0,21
5000	2,24	1,72	0,21
6300*	1,73	1,43	0,16
8000*	1,32	1,11	0,17
10000*	0,98	0,84	0,19



1/1 oct. [Hz]	α _{pi}
63*	0,25
125	0,65
250	0,65
500	0,50
1000	0,45
2000	0,35
4000	0,20
8000*	0,15

Absorption coefficient α _w	Absorption class
0,35(L)	D



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

* Not included in the scope of accreditation



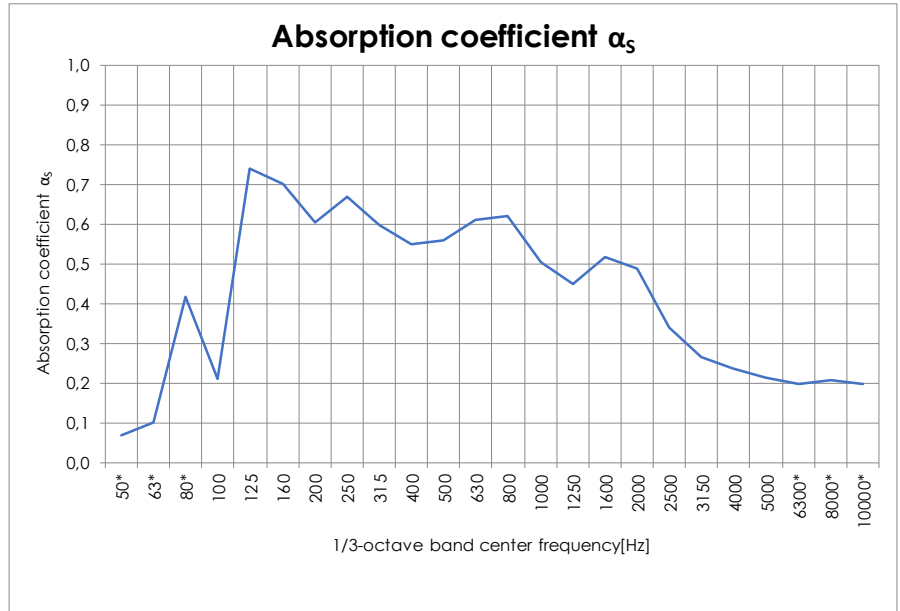
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	47 mm open	Project ID:	3436-1-15
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,3 °C 49 %RH 1007 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

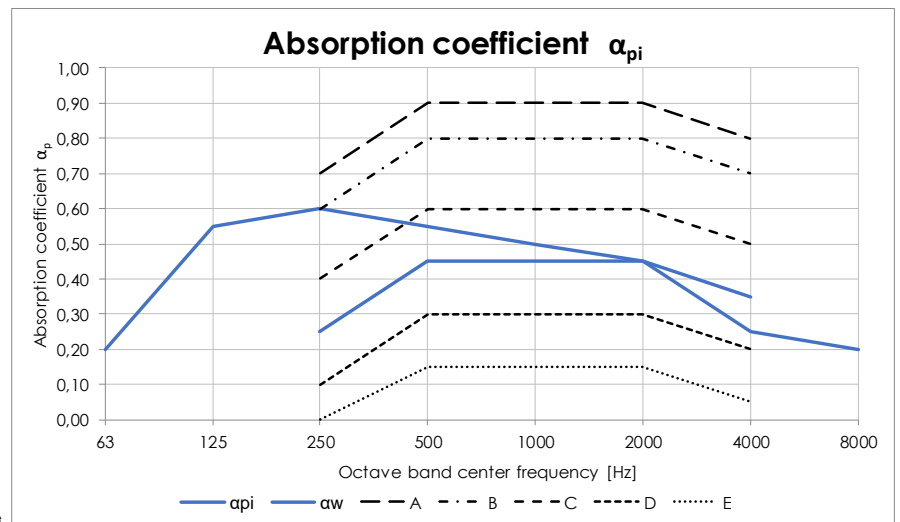


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	4,86	0,07
63*	5,81	4,36	0,10
80*	5,27	2,41	0,42
100	4,99	3,17	0,21
125	6,25	1,80	0,74
160	6,76	1,92	0,70
200	6,59	2,10	0,61
250	5,44	1,85	0,67
315	5,68	2,01	0,60
400	6,11	2,19	0,55
500	5,97	2,15	0,56
630	6,04	2,04	0,61
800	5,23	1,91	0,62
1000	5,19	2,17	0,50
1250	4,45	2,15	0,45
1600	3,86	1,86	0,52
2000	3,78	1,89	0,49
2500	3,29	2,04	0,34
3150	3,11	2,12	0,27
4000	2,78	1,99	0,24
5000	2,24	1,72	0,21
6300*	1,73	1,39	0,20
8000*	1,32	1,09	0,21
10000*	0,98	0,83	0,20



1/1 oct. [Hz]	α _{pi}
63*	0,20
125	0,55
250	0,60
500	0,55
1000	0,50
2000	0,45
4000	0,25
8000*	0,20

Absorption coefficient α _w	Absorption class
0,45(L)	D



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

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* Not included in the scope of accreditation



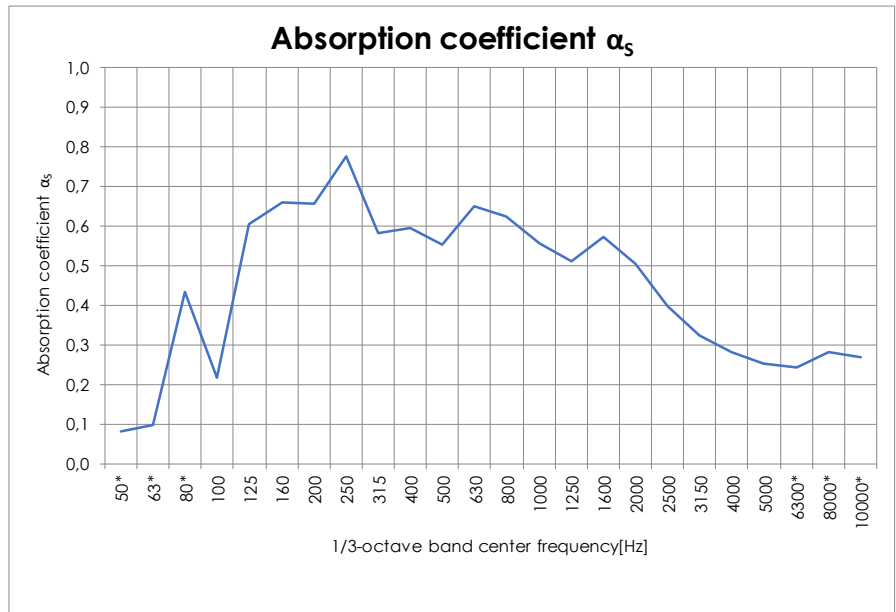
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	57 mm open	Project ID:	3436-1-16
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,3 °C 50 %RH 1007 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

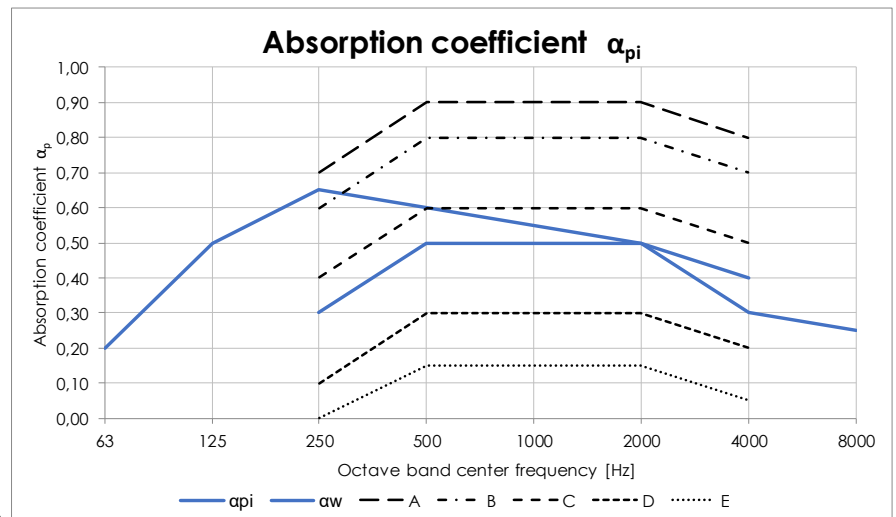


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	4,68	0,08
63*	5,81	4,39	0,10
80*	5,27	2,36	0,43
100	4,99	3,13	0,22
125	6,25	2,07	0,61
160	6,76	2,00	0,66
200	6,59	1,99	0,66
250	5,44	1,67	0,78
315	5,68	2,05	0,58
400	6,11	2,08	0,59
500	5,97	2,16	0,55
630	6,04	1,95	0,65
800	5,23	1,91	0,62
1000	5,19	2,05	0,55
1250	4,45	2,00	0,51
1600	3,86	1,76	0,57
2000	3,78	1,86	0,50
2500	3,29	1,91	0,40
3150	3,11	1,99	0,32
4000	2,78	1,90	0,28
5000	2,24	1,66	0,25
6300*	1,73	1,35	0,24
8000*	1,32	1,04	0,28
10000*	0,98	0,81	0,27



1/1 oct. [Hz]	α _{pi}
63*	0,20
125	0,50
250	0,65
500	0,60
1000	0,55
2000	0,50
4000	0,30
8000*	0,25

Absorption coefficient α _w	Absorption class
0,50(L)	D



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

* Not included in the scope of accreditation

ver. 1.2



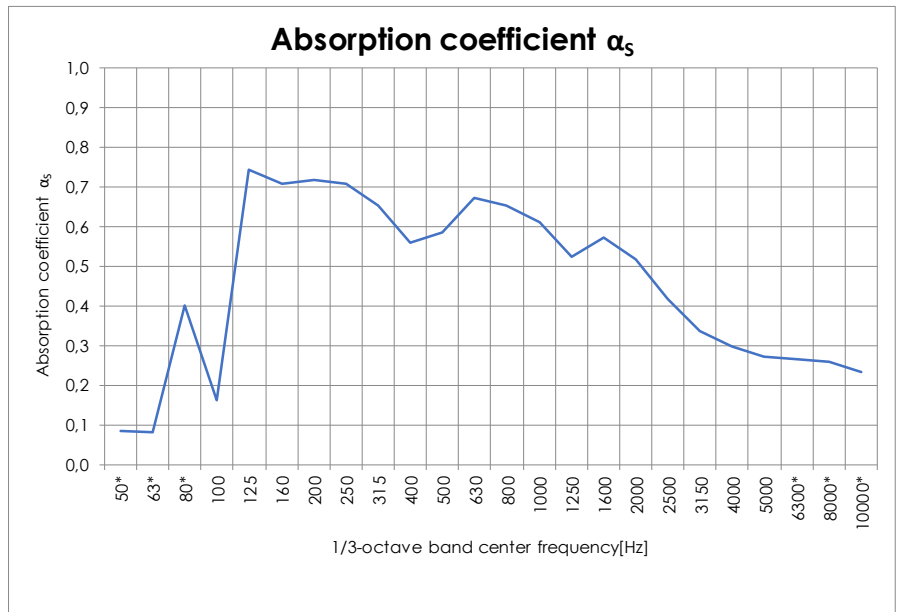
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer: Idea-Puu Oy Date: 28.10.2020
 Tested product: KAIKUA variable acoustic wall panel
 Control position: 65 mm open Engineer: TS
 Product surface area: 11,83 m² 14 pcs
 Mounting of product: directly against the room surface Project ID: 3436-1-17
 Empty room conditions: 21,3 °C 54 %RH 1005 hPa
 Conditions during the test: 21,3 °C 49 %RH 1006 hPa
 Room volume / surf. area: 141,3 m³ / 166,1 m²

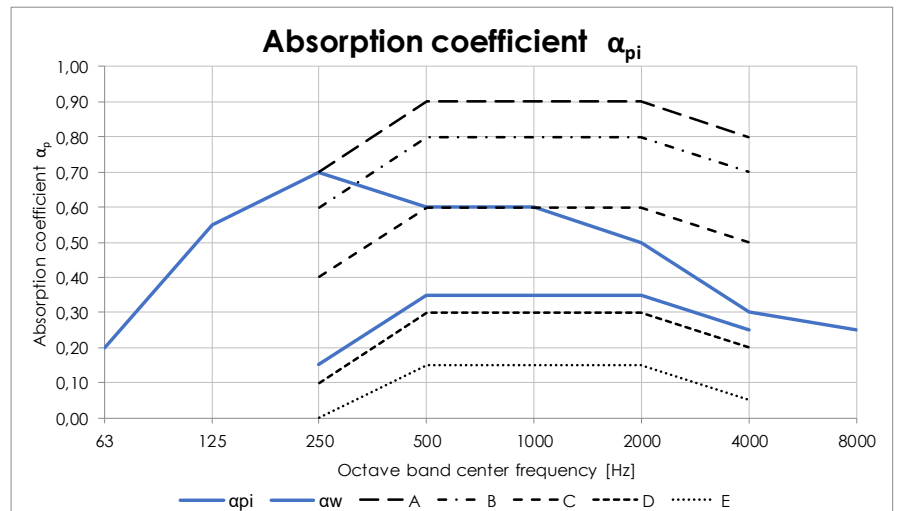


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	4,66	0,08
63*	5,81	4,58	0,08
80*	5,27	2,47	0,40
100	4,99	3,45	0,16
125	6,25	1,80	0,74
160	6,76	1,90	0,71
200	6,59	1,87	0,72
250	5,44	1,78	0,71
315	5,68	1,90	0,65
400	6,11	2,16	0,56
500	5,97	2,08	0,59
630	6,04	1,91	0,67
800	5,23	1,85	0,65
1000	5,19	1,93	0,61
1250	4,45	1,98	0,52
1600	3,86	1,77	0,57
2000	3,78	1,84	0,52
2500	3,29	1,88	0,42
3150	3,11	1,96	0,34
4000	2,78	1,87	0,30
5000	2,24	1,63	0,27
6300*	1,73	1,33	0,27
8000*	1,32	1,06	0,26
10000*	0,98	0,82	0,23



1/1 oct. [Hz]	α _{pi}
63*	0,20
125	0,55
250	0,70
500	0,60
1000	0,60
4000	0,30
8000*	0,25

Absorption coefficient α _w	Absorption class
0,35(LM)	D



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

* Not included in the scope of accreditation



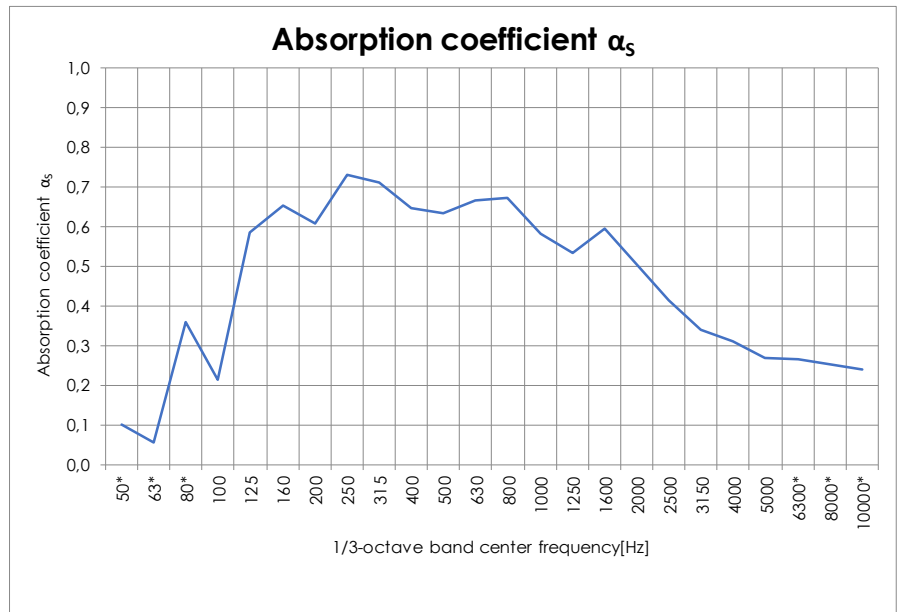
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	69 mm open	Project ID:	3436-1-18
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,3 °C 49 %RH 1007 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

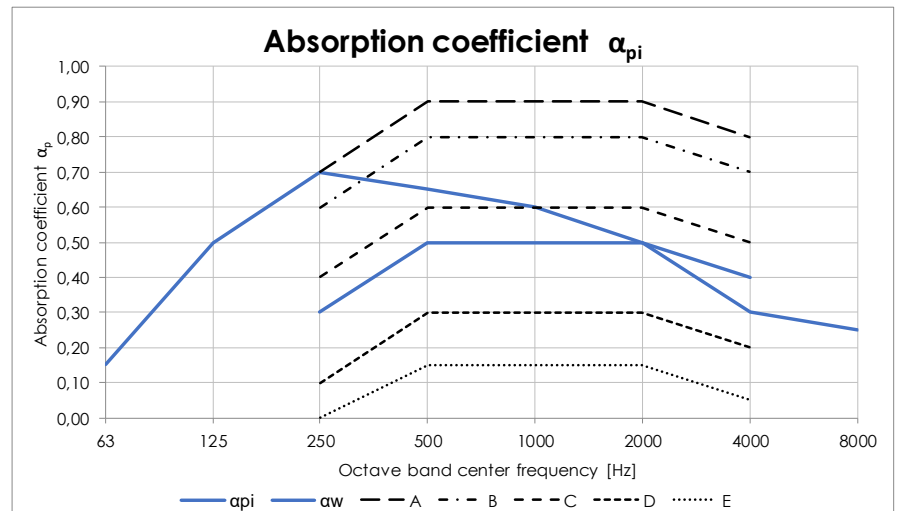


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	4,47	0,10
63*	5,81	4,86	0,06
80*	5,27	2,61	0,36
100	4,99	3,16	0,21
125	6,25	2,11	0,59
160	6,76	2,01	0,65
200	6,59	2,10	0,61
250	5,44	1,74	0,73
315	5,68	1,80	0,71
400	6,11	1,97	0,65
500	5,97	1,98	0,63
630	6,04	1,92	0,67
800	5,23	1,82	0,67
1000	5,19	1,98	0,58
1250	4,45	1,96	0,53
1600	3,86	1,73	0,60
2000	3,78	1,86	0,50
2500	3,29	1,89	0,41
3150	3,11	1,95	0,34
4000	2,78	1,85	0,31
5000	2,24	1,64	0,27
6300*	1,73	1,33	0,27
8000*	1,32	1,06	0,25
10000*	0,98	0,82	0,24



1/1 oct. [Hz]	α _{pi}
63*	0,15
125	0,50
250	0,70
500	0,65
1000	0,60
2000	0,50
4000	0,30
8000*	0,25

Absorption coefficient α _w	Absorption class
0,50(L)	D



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

* Not included in the scope of accreditation

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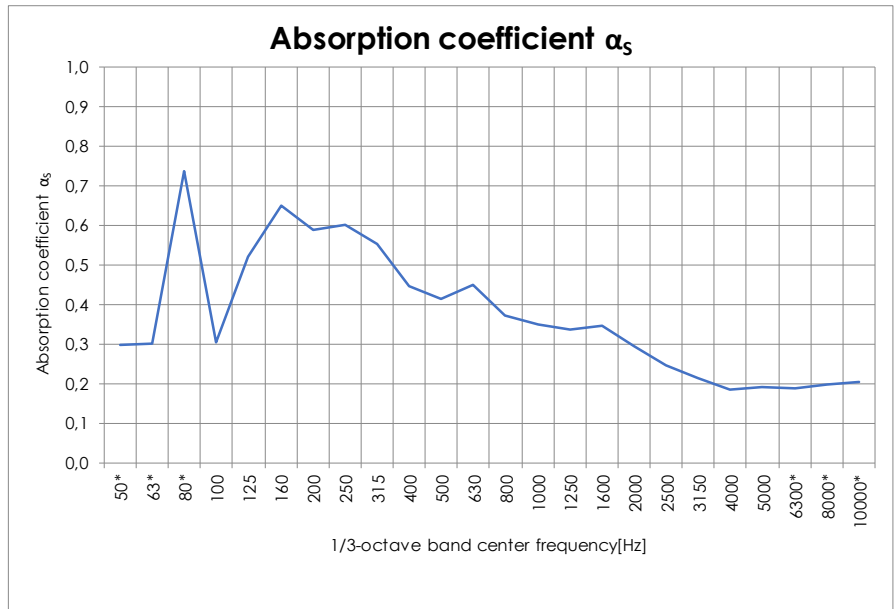
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	Panels fully open/closed (7/7), lines	Project ID:	3436-1-19
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,3 °C 49 %RH 1007 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		



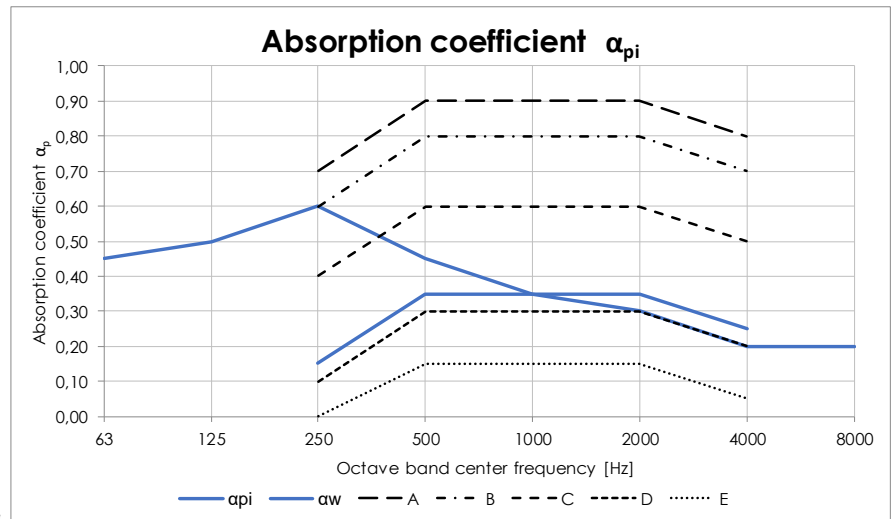
1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	3,06	0,30
63*	5,81	2,99	0,30
80*	5,27	1,71	0,74
100	4,99	2,74	0,30
125	6,25	2,28	0,52
160	6,76	2,02	0,65
200	6,59	2,14	0,59
250	5,44	1,98	0,60
315	5,68	2,12	0,55
400	6,11	2,48	0,45
500	5,97	2,57	0,41
630	6,04	2,46	0,45
800	5,23	2,56	0,37
1000	5,19	2,63	0,35
1250	4,45	2,47	0,34
1600	3,86	2,24	0,35
2000	3,78	2,35	0,29
2500	3,29	2,26	0,25
3150	3,11	2,24	0,21
4000	2,78	2,11	0,19
5000	2,24	1,75	0,19
6300*	1,73	1,40	0,19
8000*	1,32	1,09	0,20
10000*	0,98	0,83	0,20



1/1 oct. [Hz]	α _{pi}
63*	0,45
125	0,50
250	0,60
500	0,45
1000	0,35
2000	0,30
4000	0,20
8000*	0,20

Absorption coefficient α _w	Absorption class
0,35(L)	D

It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.



ver. 1.2

* Not included in the scope of accreditation



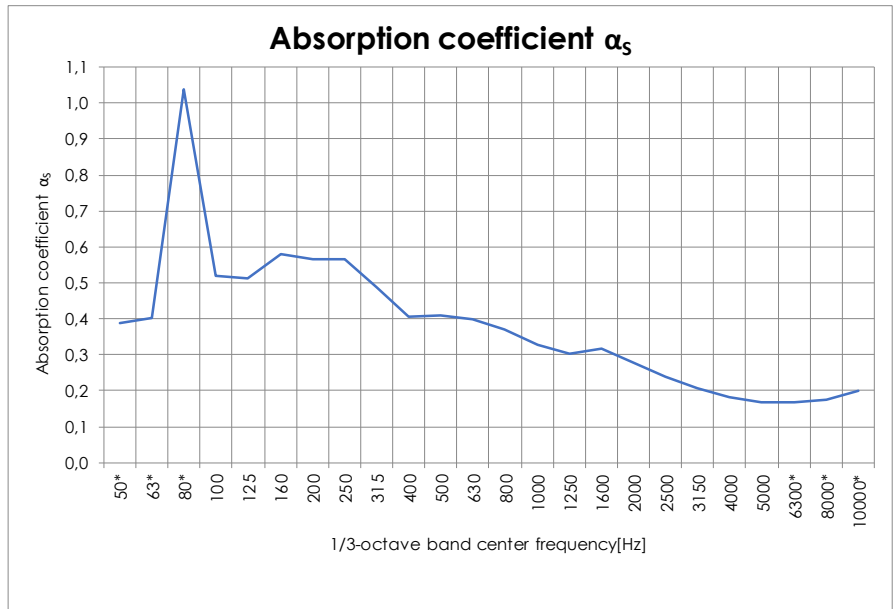
Sound absorption in reverberation room

Measurements and calculations according to ISO 354:2003. Classification according to SFS-EN ISO 11654:1997.

Customer:	Idea-Puu Oy	Date:	28.10.2020
Tested product:	KAIKUA variable acoustic wall panel	Engineer:	TS
Control position:	Panels fully open/closed (6/8), columns	Project ID:	3436-1-20
Product surface area:	11,83 m ² 14 pcs		
Mounting of product:	directly against the room surface		
Empty room conditions:	21,3 °C 54 %RH 1005 hPa		
Conditions during the test:	21,3 °C 49 %RH 1007 hPa		
Room volume / surf. area:	141,3 m ³ / 166,1 m ²		

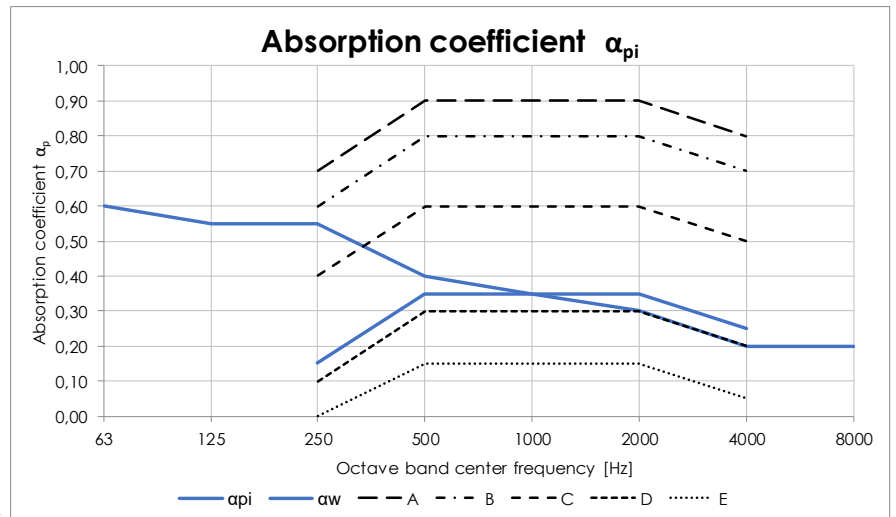


1/3-octave band center frequency [Hz]	T ₁ [s]	T ₂ [s]	α _s [-]
50*	5,99	2,66	0,39
63*	5,81	2,58	0,40
80*	5,27	1,35	1,04**
100	4,99	2,09	0,52
125	6,25	2,30	0,51
160	6,76	2,18	0,58
200	6,59	2,20	0,57
250	5,44	2,05	0,57
315	5,68	2,28	0,49
400	6,11	2,62	0,41
500	5,97	2,59	0,41
630	6,04	2,63	0,40
800	5,23	2,56	0,37
1000	5,19	2,71	0,33
1250	4,45	2,57	0,30
1600	3,86	2,31	0,32
2000	3,78	2,40	0,28
2500	3,29	2,28	0,24
3150	3,11	2,26	0,21
4000	2,78	2,11	0,18
5000	2,24	1,79	0,17
6300*	1,73	1,42	0,17
8000*	1,32	1,10	0,18
10000*	0,98	0,83	0,20



1/1 oct. [Hz]	α _{pi}
63*	0,60
125	0,55
250	0,55
500	0,40
1000	0,35
2000	0,30
4000	0,20
8000*	0,20

Absorption coefficient α _w	Absorption class
0,35(L)	D



It is strongly recommended to use this single-number rating in combination with the complete sound absorption coefficient curve that can be obtained on request.

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* Not included in the scope of accreditation

** Result is evaluated from reverberation time measurements, and can have values larger than 1,0.