

**Laboratory measurements
for International Cellulose Corporation
Europe**
Sonaspray absorption measurements

Commissioning party

ICC Europe

Contact

Mr Joe Witt

Reference

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1 Introduction

Measurements were performed with regard to the acoustic absorption of the Sonaspray material on March 7 and 2018 at the instructions of ICC Europe. The measurements were performed in the Kees van Dorsser laboratory reverberation room located at Neherkade 1, The Hague, the Netherlands.

The aim of the measurements was to determine the acoustic absorption coefficient of three different types of Sonaspray in different thicknesses used on a load-bearing surface.

The performed measurements and the measurement results are elaborated in this report.

2 Product description

Sonaspray is an acoustic spray Cellulose that can be applied on load-bearing backgrounds such as walls and ceilings. In this case, the Sonaspray material has been applied in accordance with the instructions of the manufacturer on the plasterboard (12.5 mm plasterboard thickness).

For the test, the spray Cellulose was applied well before the measurements were taken on the plasterboard as the base of the Cellulose plaster. These plasterboards have dimensions of 1.5 m by 1.0 m.

The reason being that the material must dry out sufficiently before the measurements are performed so that a good comparison can be made if used in practice.

The content information about the Sonaspray spray Cellulose are described in confidential letter B058906ab.184R2B7.go that is part of the final document R058906ab.183ZBAA.hve_01, April 3, 2018.

This confidential letter ensures that there is a record of which materials with regard to content the manufacturer has had used to perform the test. The commissioning party and LBP|SIGHT are aware of this letter.

An overview of the LBP|SIGHT tested variants is given in table 2.1.

Tabel 2.1

Spray Cellulose type	Thickness of the spray plaster on a plasterboard load-bearing surface
Sonaspray K13-Standard	10 mm
Sonaspray K13-Standard	15 mm
Sonaspray K13-Standard	20 mm
Sonaspray K13-Standard	25 mm
Sonaspray K13-Standard	35 mm
Sonaspray K13-Standard	45 mm
Sonaspray FC	10 mm
Sonaspray FC	15 mm
Sonaspray FC	20 mm
Sonaspray FC	25 mm
Sonaspray K13-Special	10 mm
Sonaspray K13-Special	15 mm
Sonaspray K13-Special	20 mm
Sonaspray K13-Special	25 mm

3 Measuring set-up

A set-up was created for each variant with a total area of 12 m². The spray Cellulose has been applied well before the measurements were taken on a plasterboard load-bearing surface. This concerns 8 plasterboards with a thickness of 12.5 mm and dimensions of 1.5 m by 1.0 m. These plasterboards will be positioned on another layer of plasterboards that also have a thickness of 12.5 mm that lay on the laboratory floor as a matrix. The total thickness of the load-bearing surface is 25 mm. We expect that these load-bearing layers will not have a relevant impact on the absorption measurements.

The boards were positioned one next to each other in a rectangle basically diagonally flat on the concrete floor of the reverberation room and provided with a framework. This timber framework that protected all of the sides was structured using a timber frame with a thickness of 32 mm and a height of 70 mm. Photos are included in figures I.1 to I.4 of appendix I of the structure of the measuring set-up.

Please refer to appendix II for a description of the reverberation room and the used measuring equipment.

4 Measurement results

The measurements of the acoustic absorption were performed in accordance with NEN-EN-ISO 354:2003(E) of 1 July 2003. Please refer to appendix III for a description of the measuring method.

Appendix IV includes the results of the measurements including a graphic representation thereof. Table 4.1 summarises the results of the measurements.

Tabel 4.1
Results of the measurements of the acoustic absorption

Plasterboard load bearing surface: 25 mm	Thickness spray Cellulose	Acoustic absorption coefficient [-] per octave band [Hz]						α_w [-]	NRC [-]
		125	250	500	1.000	2.000	4.000		
Sonaspray K13-Standard	10 mm	0,10	0,20	0,46	0,66	0,78	0,89	0,45	0,55
Sonaspray K13-Standard	15 mm	0,17	0,26	0,63	0,85	0,93	0,98	0,55	0,65
Sonaspray K13-Standard	20 mm	0,16	0,34	0,74	0,95	0,97	0,94	0,6	0,75
Sonaspray K13-Standard	25 mm	0,23	0,49	0,87	0,96	0,97	0,86	0,75	0,80
Sonaspray K13-Standard	35 mm	0,26	0,62	1,02	1,07	1,01	0,96	0,9	0,95
Sonaspray K13-Standard	45 mm	0,33	0,77	1,12	1,11	1,01	0,93	1	1,00
Sonaspray FC	10 mm	0,10	0,20	0,48	0,77	0,90	1,00	0,45	0,60
Sonaspray FC	15 mm	0,12	0,25	0,62	0,92	0,98	1,02	0,5	0,70
Sonaspray FC	20 mm	0,17	0,37	0,82	1,04	1,00	0,97	0,65	0,80
Sonaspray FC	25 mm	0,18	0,42	0,88	1,05	0,99	0,97	0,7	0,85
Sonaspray K13-Special	10 mm	0,15	0,28	0,59	0,86	0,95	1,02	0,55	0,65
Sonaspray K13-Special	15 mm	0,15	0,33	0,69	0,95	0,98	0,97	0,6	0,75
Sonaspray K13-Special	20 mm	0,16	0,33	0,75	0,96	0,98	0,97	0,6	0,75
Sonaspray K13-Special	25 mm	0,20	0,44	0,89	1,01	0,98	0,93	0,7	0,85

The presented results of the measurements of the acoustic absorption apply to the tested samples as described in relation to the measuring set-up.

Acoustic absorption in practice is also influenced by the background on which the material is applied.

LBP|SIGHT BV



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Appendix I.
Measuring set-up photos

Figure I.1



Measuring set-up in the reverberation room

Figure I.2



Detail

Figure I.3



Set-up: Sonaspray FC: 10 mm on a load-bearing surface

Figure I.4



Set-up: Sonaspray K13-Standard: 35 mm on a load-bearing surface consisting of plasterboard

Appendix II.

Reverberation room and measuring equipment

Reverberation room

Figure II.1 includes a floor plan of the measurement rooms in the Kees van Dorsser laboratory in The Hague. Measurement room 2, the reverberation room, was used for measuring the acoustic absorption using the reverberation method. The specifications of measuring room 2 are:

- Height: 5.60 - 6.05 m;
- Floor area: 42 m²;
- Enclosing area: 240 m²;
- Empty room volume: 216 m³.

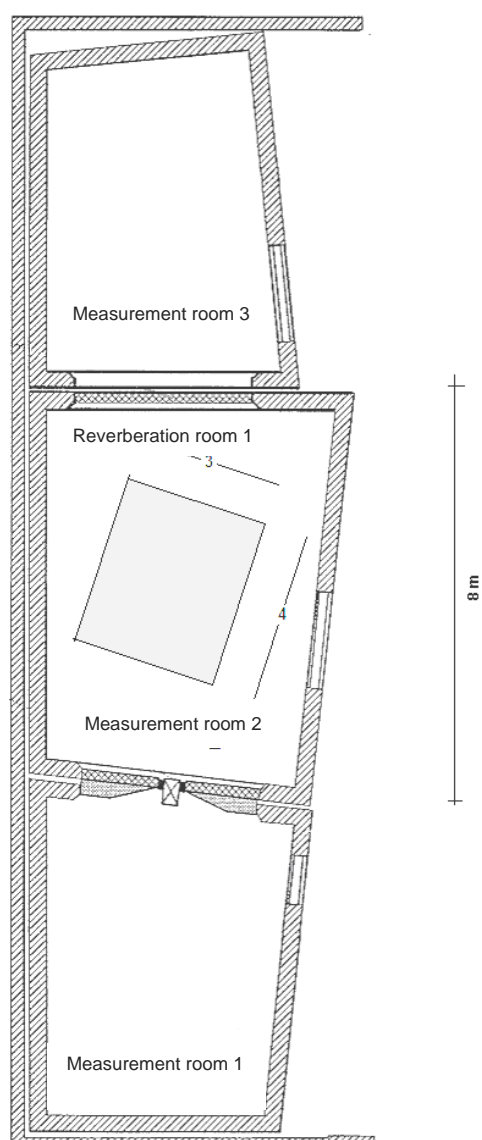


Figure II.1

Floor plan of the measurement rooms in the Kees van Dorsser laboratory with measuring set-up.

Measuring equipment

The following measuring equipment was used for the measurements:

- Brüel & Kjær 1/2" microphones, type 4165.
- Brüel & Kjær real time analyser, type 2131.
- Quad amplifier, type 405.
- Bose speakers, type 802.

Appendix III.
Measuring method

Measurement and calculation results

The acoustic absorption coefficient is determined based on:

$$\alpha_s = \frac{\frac{V_2}{6T_2} - \frac{V_1}{6T_1}}{S}$$

Where:

- α_s = the acoustic absorption coefficient of the structure to be tested per third-octave band;
- V_1 = the volume of the empty reverberation room in m³;
- V_2 = the volume of the empty reverberation room with the structure to be tested in m³;
- S = the area of the structure to be tested (in this case, 10.5 m²);
- T_1 = the reverberation time of the empty reverberation room;
- T_2 = the reverberation time of the reverberation room with the structure to be tested.

The empty reverberation room has a volume of 216 m³. The reverberation room including the structure has a minimum volume of approximately 215 m³.

In addition to the acoustic absorption coefficient per third octave band, it is the norm to also indicate the one-figure values such as the α_w and NRC.

Acoustic absorption coefficient α_w

The α_w term is one method for expressing the average absorption coefficient of a material. The weighted acoustic absorption α_w is determined in accordance with the NEN-EN-ISO 11654 standard based on the measurements in accordance with the NEN-EN-ISO 354 standard.

The weighted acoustic absorption α_w is, next, determined by the measured values in octave bands by comparing the medium frequencies 250 to 4,000 Hz with a shifted reference curve where the total of the negative deviations may not be more than 0.10. The value that the shifted reference curve indicates at 500 Hz is α_w rounded off to the closest multiple of 0.05.

Noise Reduction Coefficient

A different term that can be used to express the acoustic absorbing effect of a material is the Noise Reduction Coefficient (NRC). In accordance to the American ASTM C423-09A standard, the NRC can be established by determining the computational average of the octave bands with medium frequencies 250 to 2,000 Hz and rounding the obtained figure off to the closest multiple of 0.0

Appendix IV.
Measurement results

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 1

Kees van Dorsser laboratory (LBP|SIGHT)

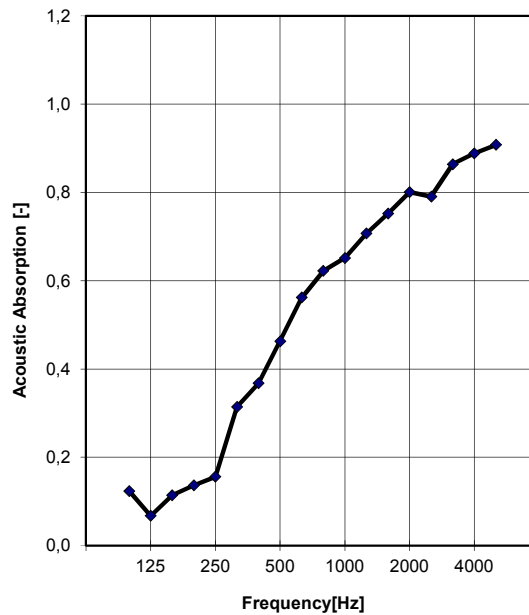
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 7 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray K13 Standard
 Average thickness spray/fibre plaster of 10mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 15°C
Total thickness: 35mm **Relative humidity** 64%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{empty}	T _{full}	α_s	α_p
100	5,33	4,36	0,12	
125	4,86	4,37	0,07	0,10
160	4,97	4,17	0,11	
200	4,80	3,93	0,14	
250	4,32	3,52	0,16	0,20
315	5,20	3,36	0,31	
400	5,34	3,22	0,37	
500	5,61	3,00	0,46	0,46
630	5,57	2,72	0,56	
800	5,30	2,52	0,62	
1000	5,26	2,45	0,65	0,66
1250	4,95	2,28	0,71	
1600	4,59	2,13	0,75	
2000	4,04	1,94	0,80	0,78
2500	3,40	1,79	0,79	
3150	2,91	1,58	0,86	
4000	2,40	1,40	0,89	0,89
5000	1,89	1,20	0,91	



Designations in accordance with ISO 11654

Designations in accordance with ASTM C423-99

Weighted sound absorption α_w :	0,45 (H)	Noise Reduction Coefficient, NRC:	0,55
Sound Absorption Class :	D	Sound Absorption Average, SAA:	0,53

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 2

Kees van Dorsser laboratory (LBP|SIGHT)

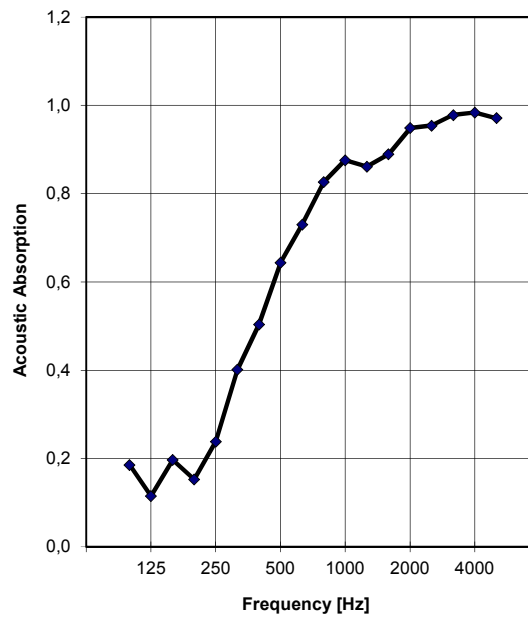
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 7 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray K13 Standard
 Average thickness spray/fibre plaster of 15mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 15°C
Total thickness: 40mm **Relative humidity** 64%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{empty}	T _{full}	α_s	α_p
100	5,33	4,00	0,19	
125	4,86	4,09	0,11	0,17
160	4,97	3,74	0,20	
200	4,80	3,85	0,15	
250	4,32	3,21	0,24	0,26
315	5,20	3,06	0,40	
400	5,34	2,81	0,50	
500	5,61	2,54	0,64	0,63
630	5,57	2,36	0,73	
800	5,30	2,15	0,83	
1000	5,26	2,07	0,88	0,85
1250	4,95	2,04	0,86	
1600	4,59	1,94	0,89	
2000	4,04	1,77	0,95	0,93
2500	3,40	1,63	0,95	
3150	2,91	1,49	0,98	
4000	2,40	1,34	0,98	0,98
5000	1,89	1,17	0,97	



Designations in accordance with ISO 11654

Designations in accordance with ASTM C423-99

Weighted sound absorption α_w :	0,55 (MH)	Noise Reduction Coefficient, NRC:	0,65
Sound Absorption Class :	D	Sound Absorption Average, SAA:	0,67

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 3

Kees van Dorsser laboratory (LBP|SIGHT)

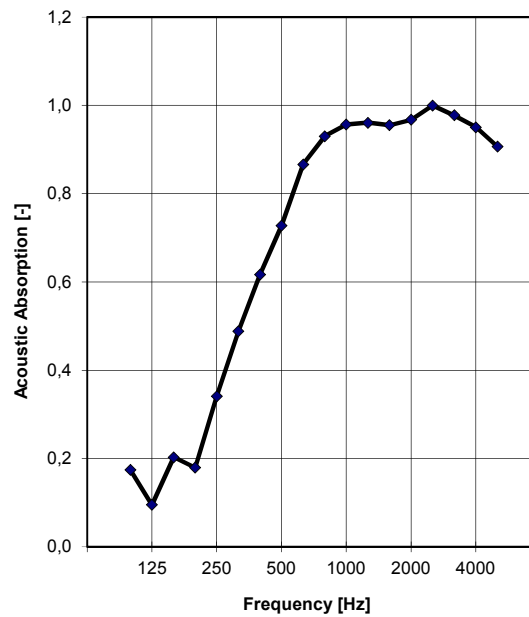
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 7 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray K13 Standard
 Average thickness spray/fibre plaster of 20mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 15°C
Total thickness: 45mm **Relative humidity** 64%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{empty}	T _{full}	α_s	α_p
100	5,33	4,06	0,17	
125	4,86	4,20	0,10	0,16
160	4,97	3,71	0,20	
200	4,80	3,72	0,18	
250	4,32	2,89	0,34	0,34
315	5,20	2,81	0,49	
400	5,34	2,54	0,62	
500	5,61	2,37	0,73	0,74
630	5,57	2,13	0,87	
800	5,30	2,00	0,93	
1000	5,26	1,96	0,96	0,95
1250	4,95	1,91	0,96	
1600	4,59	1,86	0,96	
2000	4,04	1,75	0,97	0,97
2500	3,40	1,59	1,00	
3150	2,91	1,49	0,98	
4000	2,40	1,36	0,95	0,94
5000	1,89	1,20	0,91	



Designations in accordance with ISO 11654

Designations in accordance with ASTM C423-99

Weighted sound absorption α_w :	0,6 (MH)	Noise Reduction Coefficient, NRC:	0,75
Sound Absorption Class :	C	Sound Absorption Average, SAA:	0,75

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 4

Kees van Dorsser laboratory (LBP|SIGHT)

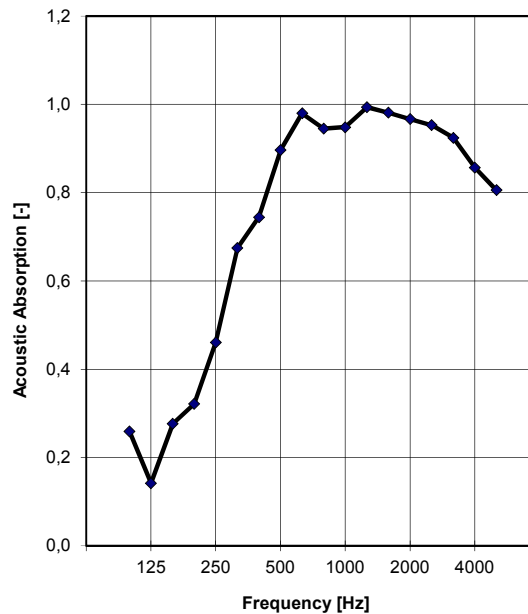
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 7 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray K13 Standard
 Average thickness spray/fibre plaster of 25mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 15°C
Total thickness: 50mm **Relative humidity** 64%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{empty}	T _{full}	α_s	α_p
100	5,33	3,64	0,26	
125	4,86	3,94	0,14	0,23
160	4,97	3,40	0,28	
200	4,80	3,16	0,32	
250	4,32	2,59	0,46	0,49
315	5,20	2,39	0,67	
400	5,34	2,29	0,74	
500	5,61	2,09	0,90	0,87
630	5,57	1,97	0,98	
800	5,30	1,98	0,94	
1000	5,26	1,97	0,95	0,96
1250	4,95	1,87	0,99	
1600	4,59	1,83	0,98	
2000	4,04	1,75	0,97	0,97
2500	3,40	1,63	0,95	
3150	2,91	1,53	0,92	
4000	2,40	1,42	0,86	0,86
5000	1,89	1,25	0,81	



Designations in accordance with ISO 11654		Designations in accordance with ASTM C423-99	
Weighted sound absorption α_w :	0,75 ()	Noise Reduction Coefficient, NRC:	0,80
Sound Absorption Class :	C	Sound Absorption Average, SAA:	0,82

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 5

Kees van Dorsser laboratory (LBP|SIGHT)

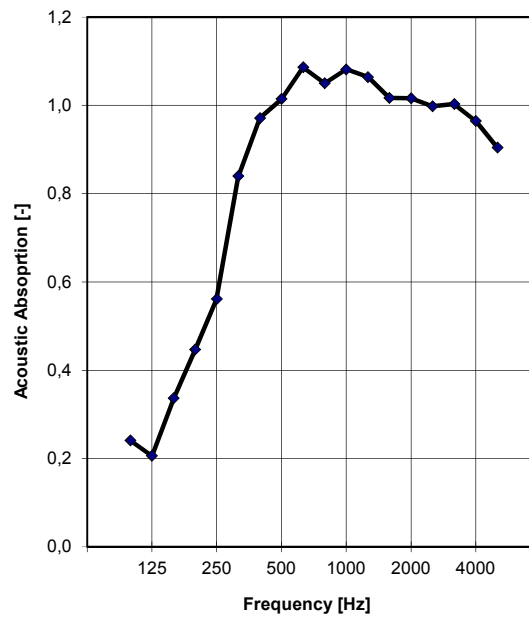
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 7 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray K13 Standard
 Average thickness spray/fibre plaster of 35mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 15°C
Total thickness: 60mm **Relative humidity** 64%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{empty}	T _{full}	α_s	α_p
100	5,33	3,72	0,24	
125	4,86	3,63	0,21	0,26
160	4,97	3,18	0,34	
200	4,80	2,79	0,45	
250	4,32	2,38	0,56	0,62
315	5,20	2,11	0,84	
400	5,34	1,95	0,97	
500	5,61	1,93	1,01	1,02
630	5,57	1,84	1,09	
800	5,30	1,85	1,05	
1000	5,26	1,81	1,08	1,07
1250	4,95	1,79	1,06	
1600	4,59	1,79	1,02	
2000	4,04	1,70	1,02	1,01
2500	3,40	1,59	1,00	
3150	2,91	1,47	1,00	
4000	2,40	1,35	0,96	0,96
5000	1,89	1,20	0,90	



Designations in accordance with ISO 11654

Designations in accordance with ASTM C423-99

Weighted sound absorption α_w : 0,9 ()

Noise Reduction Coefficient, NRC: 0,95

Sound Absorption Class : A

Sound Absorption Average, SAA: 0,93

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 6

Kees van Dorsser laboratory (LBP|SIGHT)

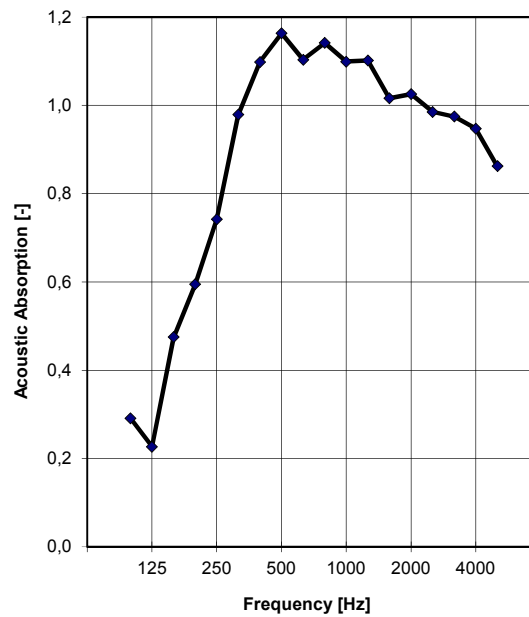
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 7 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray K13 Standard
 Average thickness spray/fibre plaster of 45mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 15°C
Total thickness: 70mm **Relative humidity** 64%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{empty}	T _{full}	α_s	α_p
100	5,33	3,50	0,29	
125	4,86	3,54	0,23	0,33
160	4,97	2,77	0,48	
200	4,80	2,45	0,59	
250	4,32	2,08	0,74	0,77
315	5,20	1,92	0,98	
400	5,34	1,80	1,10	
500	5,61	1,76	1,16	1,12
630	5,57	1,82	1,10	
800	5,30	1,75	1,14	
1000	5,26	1,79	1,10	1,11
1250	4,95	1,75	1,10	
1600	4,59	1,79	1,02	
2000	4,04	1,69	1,03	1,01
2500	3,40	1,60	0,99	
3150	2,91	1,49	0,97	
4000	2,40	1,36	0,95	0,93
5000	1,89	1,22	0,86	



Designations in accordance with ISO 11654

Designations in accordance with ASTM C423-99

Weighted sound absorption α_w :	1 ()	Noise Reduction Coefficient, NRC:	1,00
Sound Absorption Class :	A	Sound Absorption Average, SAA:	1,00

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 7

Kees van Dorsser laboratory (LBP|SIGHT)

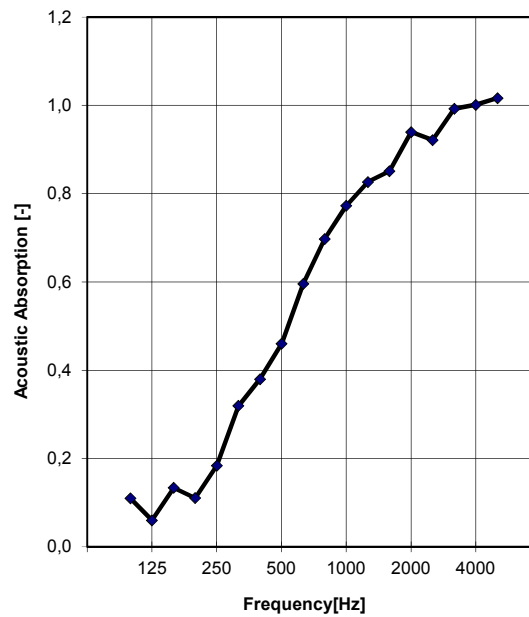
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 8 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray FC
 Average thickness spray/fibre plaster of 10mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 16°C
Total thickness: 35mm **Relative humidity** 60%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{empty}	T _{full}	α_s	α_p
100	5,33	4,45	0,11	
125	4,86	4,42	0,06	0,10
160	4,97	4,06	0,13	
200	4,80	4,07	0,11	
250	4,32	3,41	0,18	0,20
315	5,20	3,34	0,32	
400	5,34	3,18	0,38	
500	5,61	3,01	0,46	0,48
630	5,57	2,64	0,60	
800	5,30	2,37	0,70	
1000	5,26	2,23	0,77	0,77
1250	4,95	2,09	0,83	
1600	4,59	1,99	0,85	
2000	4,04	1,78	0,94	0,90
2500	3,40	1,66	0,92	
3150	2,91	1,48	0,99	
4000	2,40	1,33	1,00	1,00
5000	1,89	1,15	1,02	



Designations in accordance with ISO 11654

Designations in accordance with ASTM C423-99

Weighted sound absorption α_w :	0,45 (MH)	Noise Reduction Coefficient, NRC:	0,60
Sound Absorption Class :	D	Sound Absorption Average, SAA:	0,59

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 8

Kees van Dorsser laboratory (LBP|SIGHT)

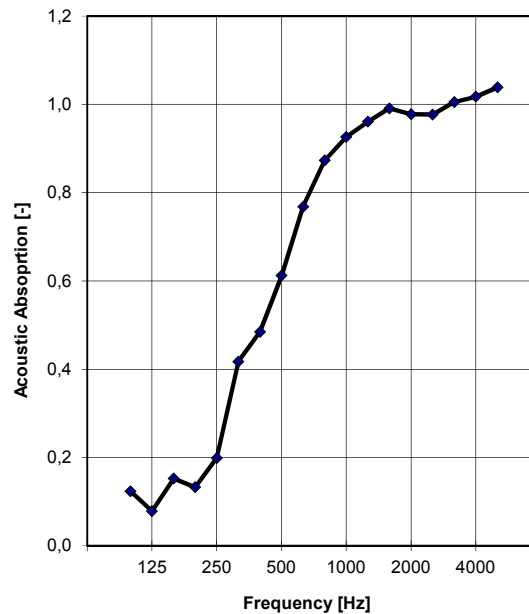
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 8 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray FC
 Average thickness spray/fibre plaster of 15mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 16°C
Total thickness: 40mm **Relative humidity** 60%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{empty}	T _{full}	α_s	α_p
100	5,33	4,36	0,12	
125	4,86	4,30	0,08	0,12
160	4,97	3,96	0,15	
200	4,80	3,95	0,13	
250	4,32	3,35	0,20	0,25
315	5,20	3,01	0,42	
400	5,34	2,86	0,48	
500	5,61	2,61	0,61	0,62
630	5,57	2,29	0,77	
800	5,30	2,08	0,87	
1000	5,26	2,00	0,93	0,92
1250	4,95	1,91	0,96	
1600	4,59	1,82	0,99	
2000	4,04	1,74	0,98	0,98
2500	3,40	1,61	0,98	
3150	2,91	1,47	1,01	
4000	2,40	1,32	1,02	1,02
5000	1,89	1,14	1,04	



Designations in accordance with ISO 11654		Designations in accordance with ASTM C423-99	
Weighted sound absorption α_w :	0,5 (MH)	Noise Reduction Coefficient, NRC:	0,70
Sound Absorption Class :	D	Sound Absorption Average, SAA:	0,69

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 9

Kees van Dorsser laboratory (LBP|SIGHT)

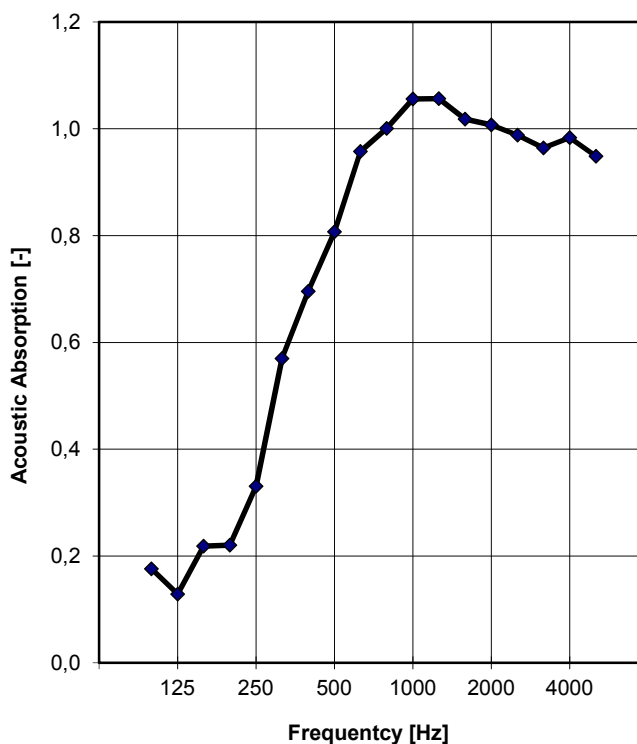
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 8 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray FC
 Average thickness spray/fibre plaster of 20mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 16°C
Total thickness: 45mm **Relative humidity** 60%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{empty}	T _{full}	α_s	α_p
100	5,33	4,05	0,18	
125	4,86	4,01	0,13	0,17
160	4,97	3,64	0,22	
200	4,80	3,54	0,22	
250	4,32	2,92	0,33	0,37
315	5,20	2,61	0,57	
400	5,34	2,38	0,70	
500	5,61	2,23	0,81	0,82
630	5,57	2,00	0,96	
800	5,30	1,91	1,00	
1000	5,26	1,84	1,06	1,04
1250	4,95	1,80	1,06	
1600	4,59	1,79	1,02	
2000	4,04	1,71	1,01	1,00
2500	3,40	1,60	0,99	
3150	2,91	1,50	0,96	
4000	2,40	1,34	0,98	0,97
5000	1,89	1,18	0,95	



Designations in accordance with ISO 11654

Designations in accordance with ASTM C423-99

Weighted sound absorption α_w :	0,65 (MH)	Noise Reduction Coefficient, NRC:	0,80
Sound Absorption Class :	C	Sound Absorption Average, SAA:	0,81

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 10

Kees van Dorsser laboratory (LBP|SIGHT)

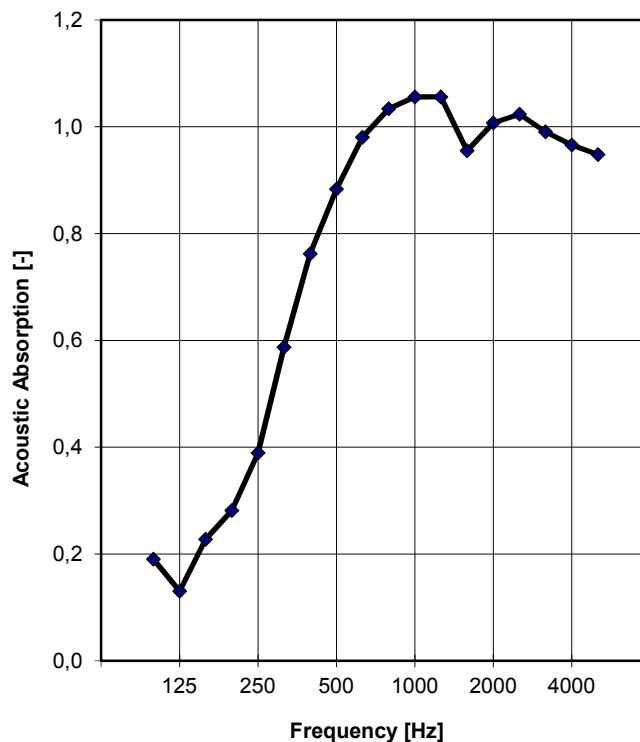
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 8 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray FC
 Average thickness spray/fibre plaster of 25mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 16°C
Total thickness: 50mm **Relative humidity** 60%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{empty}	T _{full}	α_s	α_p
100	5,33	3,97	0,19	
125	4,86	4,00	0,13	0,18
160	4,97	3,60	0,23	
200	4,80	3,30	0,28	
250	4,32	2,76	0,39	0,42
315	5,20	2,57	0,59	
400	5,34	2,26	0,76	
500	5,61	2,11	0,88	0,88
630	5,57	1,97	0,98	
800	5,30	1,87	1,03	
1000	5,26	1,84	1,06	1,05
1250	4,95	1,80	1,06	
1600	4,59	1,86	0,95	
2000	4,04	1,71	1,01	0,99
2500	3,40	1,57	1,02	
3150	2,91	1,48	0,99	
4000	2,40	1,35	0,97	0,97
5000	1,89	1,18	0,95	



Designations in accordance with ISO 11654

Designations in accordance with ASTM C423-99

Weighted sound absorption α_w :	0,7 (MH)	Noise Reduction Coefficient, NRC:	0,85
Sound Absorption Class :	C	Sound Absorption Average, SAA:	0,83

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 11

Kees van Dorsser laboratory (LBP|SIGHT)

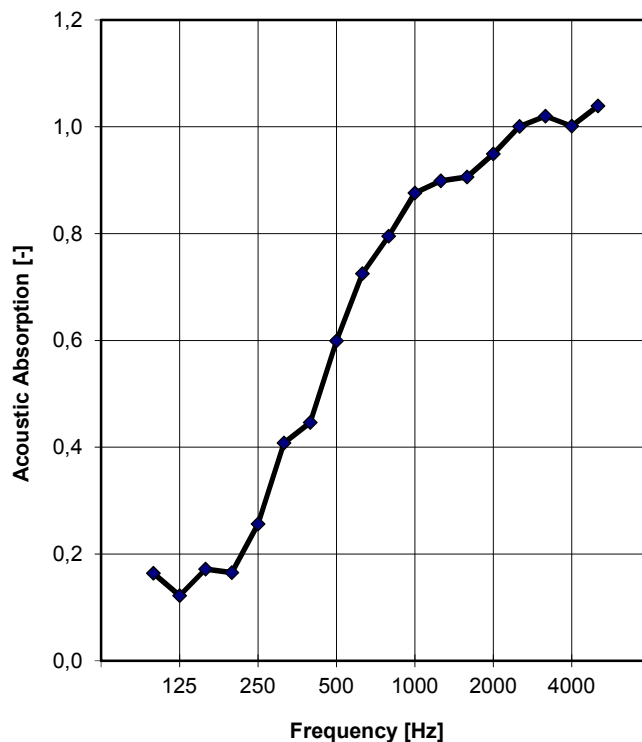
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 8 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray K13-Special
 Average thickness spray/fibre plaster of 10mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 16°C
Total thickness: 35mm **Relative humidity** 60%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{empty}	T _{full}	α_s	α_p
100	5,33	4,12	0,16	
125	4,86	4,05	0,12	0,15
160	4,97	3,86	0,17	
200	4,80	3,79	0,17	
250	4,32	3,15	0,26	0,28
315	5,20	3,04	0,41	
400	5,34	2,97	0,45	
500	5,61	2,64	0,60	0,59
630	5,57	2,37	0,72	
800	5,30	2,20	0,79	
1000	5,26	2,07	0,88	0,86
1250	4,95	1,99	0,90	
1600	4,59	1,92	0,91	
2000	4,04	1,77	0,95	0,95
2500	3,40	1,59	1,00	
3150	2,91	1,46	1,02	
4000	2,40	1,33	1,00	1,02
5000	1,89	1,14	1,04	



Designations in accordance with ISO 11654

Designations in accordance with ASTM C423-99

Weighted sound absorption α_w :	0,55 (MH)	Noise Reduction Coefficient, NRC:	0,65
Sound Absorption Class :	D	Sound Absorption Average, SAA:	0,67

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 12

Kees van Dorsser laboratory (LBP|SIGHT)

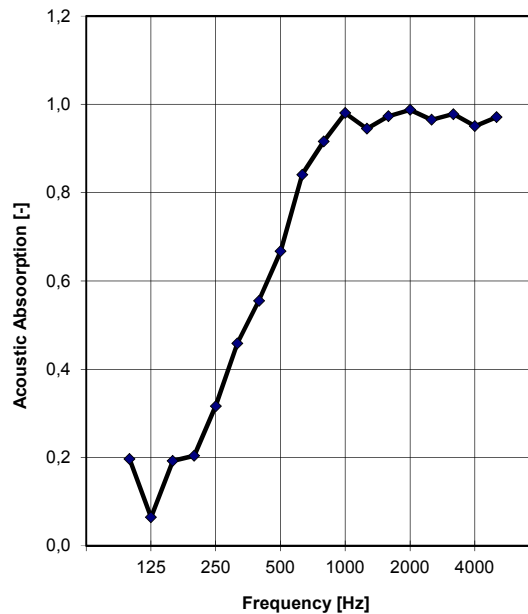
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 8 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray K13-Special
 Average thickness spray/fibre plaster of 15mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 16°C
Total thickness: 40mm **Relative humidity** 60%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{leeg}	T _{vol}	α _s	α _p
100	5,33	3,94	0,20	
125	4,86	4,39	0,06	0,15
160	4,97	3,76	0,19	
200	4,80	3,61	0,20	
250	4,32	2,96	0,32	0,33
315	5,20	2,89	0,46	
400	5,34	2,68	0,56	
500	5,61	2,49	0,67	0,69
630	5,57	2,17	0,84	
800	5,30	2,02	0,92	
1000	5,26	1,93	0,98	0,95
1250	4,95	1,93	0,94	
1600	4,59	1,84	0,97	
2000	4,04	1,73	0,99	0,98
2500	3,40	1,62	0,97	
3150	2,91	1,49	0,98	
4000	2,40	1,36	0,95	0,97
5000	1,89	1,17	0,97	



Designations in accordance with ISO 11654		Designations in accordance with ASTM C423-99	
Weighted sound absorption α _w :	0,6 (MH)	Noise Reduction Coefficient, NRC:	0,75
Sound Absorption Class :	C	Sound Absorption Average, SAA:	0,73

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 13

Kees van Dorsser laboratory (LBP|SIGHT)

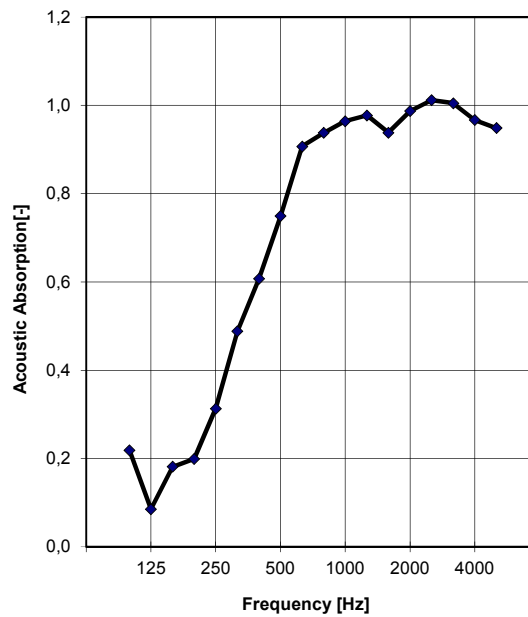
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 8 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray K13-Special
 Average thickness spray/fibre plaster of 20mm
 Load-bearing background of plaster

Structure set-up:		Temperature	16°C
Total thickness:	45mm	Relative humidity	60%
Air gap thickness:	-		
Absorption thickness			

Manufacturer ICC Europe

Freq	T _{leeg}	T _{vol}	α_s	α_p
100	5,33	3,83	0,22	
125	4,86	4,26	0,09	0,16
160	4,97	3,81	0,18	
200	4,80	3,63	0,20	
250	4,32	2,97	0,31	0,33
315	5,20	2,81	0,49	
400	5,34	2,56	0,61	
500	5,61	2,33	0,75	0,75
630	5,57	2,07	0,91	
800	5,30	1,99	0,94	
1000	5,26	1,95	0,96	0,96
1250	4,95	1,89	0,98	
1600	4,59	1,88	0,94	
2000	4,04	1,73	0,99	0,98
2500	3,40	1,58	1,01	
3150	2,91	1,47	1,00	
4000	2,40	1,35	0,97	0,97
5000	1,89	1,18	0,95	



Designations in accordance with ISO 11654

Designations in accordance with ASTM C423-99

Weighted sound absorption α_w :	0,6 (MH)	Noise Reduction Coefficient, NRC:	0,75
Sound Absorption Class :	C	Sound Absorption Average, SAA:	0,76

ACOUSTIC ABSORPTION IN ACCORDANCE WITH ISO 354:2003(E)

measurement 14

Kees van Dorsser laboratory (LBP|SIGHT)

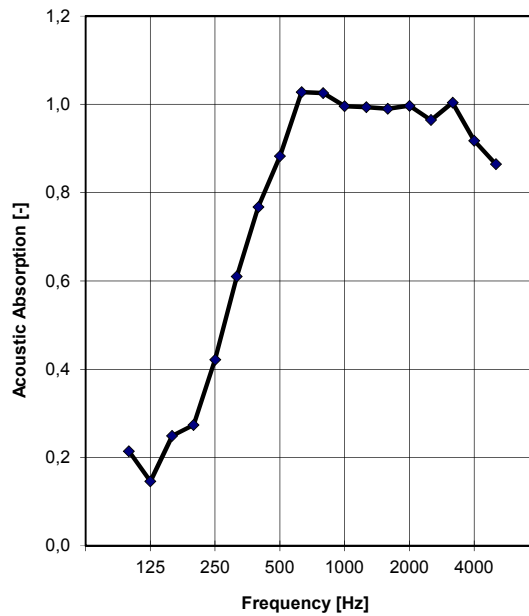
Commissioning party:	ICC Europe	Framing type	MDF
Project number:	058906ab	Area:	12 m ²
Measurement date:	March 8 , 2018	Measurement room volume:	216 m ³

Structure description: Sonaspray K13-Special
 Average thickness spray/fibre plaster of 25mm
 Load-bearing background of plaster

Structure set-up: **Temperature** 16°C
Total thickness: 50mm **Relative humidity** 60%
Air gap thickness: -
Absorption thickness

Manufacturer ICC Europe

Freq	T _{leeg}	T _{vol}	α _s	α _p
100	5,33	3,85	0,21	
125	4,86	3,92	0,15	0,20
160	4,97	3,51	0,25	
200	4,80	3,33	0,27	
250	4,32	2,68	0,42	0,44
315	5,20	2,52	0,61	
400	5,34	2,25	0,77	
500	5,61	2,11	0,88	0,89
630	5,57	1,91	1,03	
800	5,30	1,88	1,03	
1000	5,26	1,91	1,00	1,01
1250	4,95	1,87	0,99	
1600	4,59	1,82	0,99	
2000	4,04	1,72	1,00	0,98
2500	3,40	1,62	0,96	
3150	2,91	1,47	1,00	
4000	2,40	1,38	0,92	0,93
5000	1,89	1,22	0,86	



Designations in accordance with ISO 11654

Designations in accordance with ASTM C423-99

Weighted sound absorption α _w :	0,7 (MH)	Noise Reduction Coefficient, NRC:	0,85
Sound Absorption Class :	C	Sound Absorption Average, SAA:	0,83