ACOUSTICS AND LIGHTING DEPARTMENT

Acoustics Test Laboratory

TEST REPORT N° AC08-26011628/3 CONCERNING SOME PANELS OF SUSPENDED CEILING

It comprises twenty two pages.

REQUESTED BY: **ROCKFON ROCKWOOL A/S.**
Hovedgaden 501
DK-2640 HEDEHUSENE
DANEMARK

Our/Ref.: BR-70010090
26011628
CR/GA

SCOPE

Determine the sound absorption coefficient α_s of panels.

Tests made in the framework of the procedure of attestation of conformity for ceiling according to the harmonised product standard NF EN 13964 planned by the construction products directive (directive 89/106/CEE): initial type testing.

For those measurements, CSTB is notified by the French state for the European community under number N°0679.

REFERENCE TEXTS

The measurements are carried out according to the Standard NF EN ISO 354 (2004) supplemented by NF EN ISO 11654 (1997) for the expression of overall index αw.

SAMPLES SUBMITTED TO THE TESTS

Samples have been selected by the manufacturer like representative of the current product of factory "ROCKWOOL POLSKA Sp. Z o. o" in POLSKA

Date of reception in the laboratory : 11 January 2008
Origin and installation : Requester

SUMMARY LIST OF TESTS

N° test	Sample submitted to the test
1	Sonar dB 35 with plenum of 200 mm
2	Sonar Plan dB 42, Krios dB 42, Ekla dB 42 with plenum of 200 mm (*)
3	Panel n° 53 with plenum of 200 mm
4	Panel n° 54 with plenum of 200 mm
5	Sonar Plan dB 44, Krios dB 44, Ekla dB 44 with plenum of 200 mm (*)
6	Panel n° 56 with plenum of 200 mm

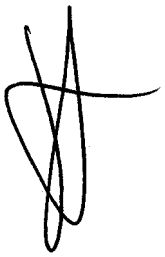
(*) There are several trade names for the same product.

Made at Marne la vallée the 06 May 2008

Responsible for the test

Cyrille ROBERT

The head of division



Jean-Baptiste CHÉNÉ

DESCRIPTION AND INSTALLATION OF SUSPENDED CEILING

Test	1
Date	18/01/08
Station	ALPHA

REQUESTER, MANUFACTURER ROCKFON. ROCKWOOL A/S

NAME Sonar dB 35

APTITUDE IN THE EMPLOYMENT Unchecked

MAIN CHARACTERISTICS

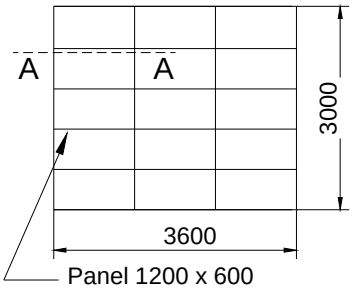
Dimensions of one panel in mm : 1200 x 600
Thickness of one panel in mm : 25
Weight per unit of area in kg/m² : 4.0
Dimensions of sample in mm : 3000 x 3600
Installation type : E-225

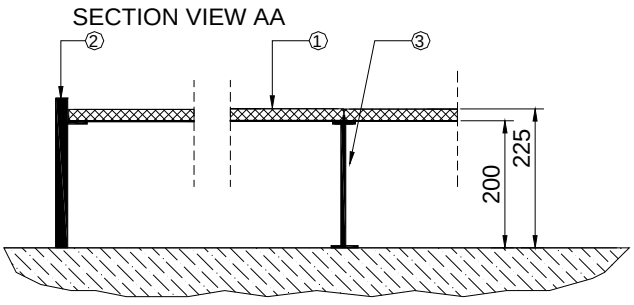
DESCRIPTION (DIMENSIONS ARE GIVEN IN MM)

Panels		
Reference		Sonar dB 35
Dimensions		1200 x 600 x 25
Constitution	Type	Rockwool/membrane – 9.600.00 PL
	Front panel	Nature : Rockwool Thickness : 25 Density : 120 kg/m^3 (theoretical) painted front fleece
	Membrane	Aluminium
Front surface		Sonar surface (Structure paint)
Edge		A + edge paint

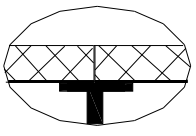
INSTALLATION

The panels are laid side to side on a metal frame with an air space under panels of 200 mm in height. They are put on a 600 x 600 grid. This grid is composed of tees spaced at interval of 600 mm.





① Panel
② Metal frame
③ Support



Dimensions in mm

TEST REPORT N° AC08-26011628/3

SOUND ABSORPTION COEFFICIENT α_s OF SUSPENDED CEILING

AA45

Test	**1**
Date	**18/01/08**
Station	**ALPHA**

REQUESTER, MANUFACTURER **ROCKFON. ROCKWOOL A/S**

NAME **Sonar dB 35**

APTITUDE IN THE EMPLOYMENT **Unchecked**

MAIN CHARACTÉRISTICS

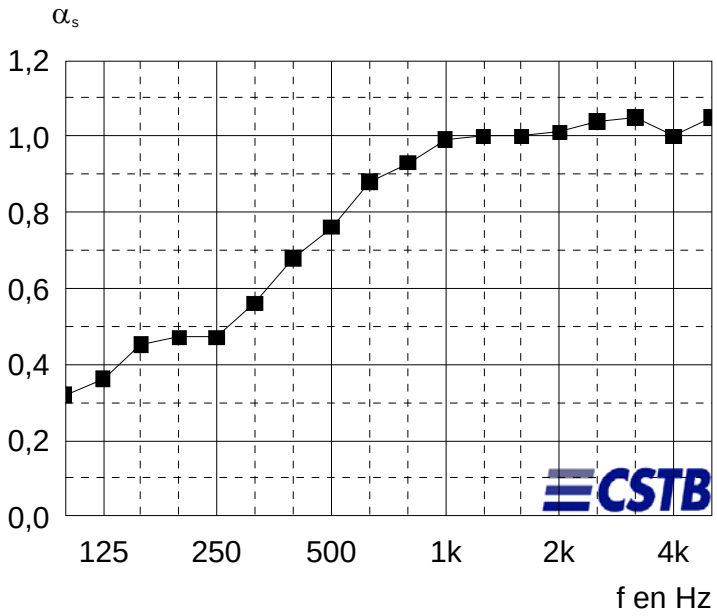
Dimensions of one panel in mm	: 1200 x 600
Thickness of one panel in mm	: 25
Weight per unit of area in kg/m²	: 4.0
Dimensions of sample in mm	: 3000 x 3600
Type of installation	: E-225

MEASUREMENT CONDITIONS

EMPTY ROOM :
Temperature : 23°C
Relative humidity:46%

ROOM WITH SAMPLE :
Temperature : 23.5°C
Relative humidity:43 %

RESULTS



f	α_s
100	0,32
125	0,36
160	0,45
200	0,47
250	0,47
315	0,56
400	0,68
500	0,76
630	0,88
800	0,93
1000	0,99
1250	1,00
1600	1,00
2000	1,01
2500	1,04
3150	1,05
4000	1,00
5000	1,05
Hz	

α_w = 0,75 (H)
classement : C

REVERBERATION TIME T

Date 18/01/08
Station ALPHA

TEST N° 1

f (Hz)	T of the empty room (s)	T of the room with sample (s)
100	11.17	5.75
125	11.55	5.47
160	11.47	4.79
200	10.30	4.48
250	10.39	4.49
315	10.82	4.11
400	10.19	3.55
500	9.75	3.25
630	9.16	2.89
800	8.59	2.74
1000	7.74	2.54
1250	7.12	2.45
1600	6.16	2.32
2000	5.55	2.22
2500	4.72	2.04
3150	3.80	1.84
4000	2.90	1.63
5000	2.22	1.37

DESCRIPTION AND INSTALLATION OF SUSPENDED CEILING

Test	2
Date	14/01/08
Station	ALPHA

REQUESTER, MANUFACTURER ROCKFON. ROCKWOOL A/S

NAME Sonar Plan dB 42, Krios dB 42, Ekla dB 42

APTITUDE IN THE EMPLOYMENT Unchecked

MAIN CHARACTERISTIC

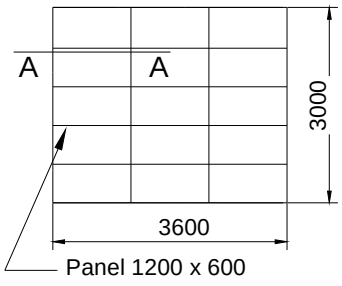
Dimensions of one panel in mm : 1200 x 600
Thickness of one panel in mm : 40
Weight per unit of area in kg/m² : 6.0
Dimensions of sample in mm : 3000 x 3600
Installation type : E-240

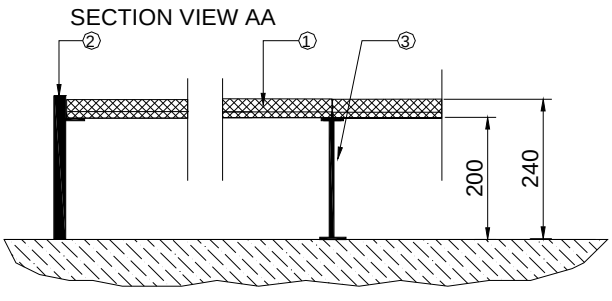
DESCRIPTION (dimensions are given in mm)

Panels		
Reference		Sonar Plan dB 42, Krios dB 42, Ekla dB 42
Dimensions		1200 x 600 x 40
Constitution	Type	Rockwool/membrane/rockwool – 9.612.00 PL
	Front panel	Nature : rockwool Thickness : 25 Density : 150 kg/m^3 (theoretical) painted front fleece
	Membrane	Aluminium
	Back panel	Nature : rockwool Thickness : 15 Density : 150 kg/m^3 (theoretical) back fleece
Front surface		Sonar Plan surface (Curtain coat)
Edge		A + edge paint

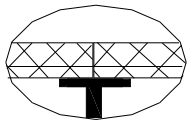
INSTALLATION

The Panels are laid side to side on a metal frame with an air space under panels of 200 mm in height. They are put on the 600 x 600 grid. This grid is composed of tees spaced at interval of 600 mm.





① Panel
② Metal frame
③ Support



Dimensions in mm

TEST REPORT N° AC08-26011628/3

SOUND ABSORPTION COEFFICIENT α_s OF SUSPENDED CEILING

Test	**2**
Date	**14/01/08**
Station	**ALPHA**

REQUESTER, MANUFACTURER **ROCKFON. ROCKWOOL A/S**

NAME **Sonar Plan dB 42, Krios dB 42, Ekla dB 42**

APTITUDE IN THE EMPLOYMENT **Unchecked**

MAIN CHARACTERISTIC

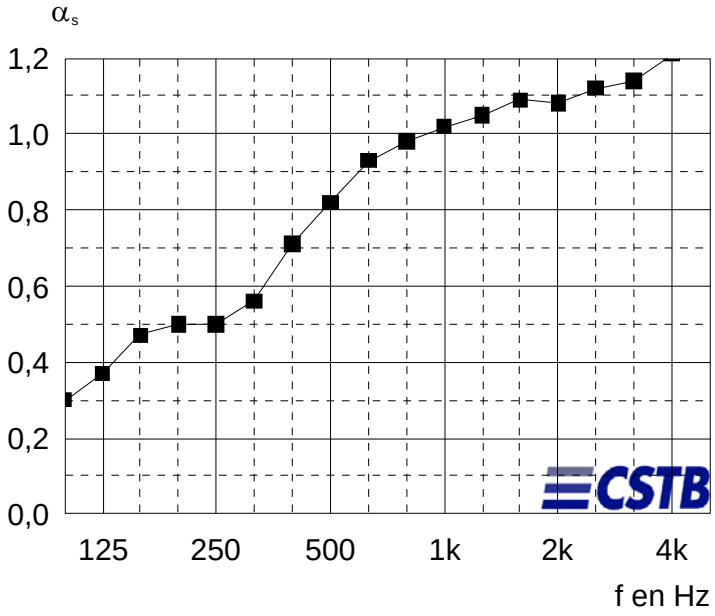
Dimensions of one panel in mm	: 1200 x 600
Thickness of one panel in mm	: 40
Weight per unit of area in kg/m²	: 6.0
Dimensions of sample in mm	: 3000 x 3600
Installation type	: E-240

CONDITIONS OF MEASUREMENT

EMPTY ROOM :
Temperature : 24 °C
Relative humidity :39 %

ROOM WITH SAMPLE :
Temperature : 24.5 °C
Relative humidity : 33 %

RESULTS



f	α_s
100	0,30
125	0,37
160	0,47
200	0,50
250	0,50
315	0,56
400	0,71
500	0,82
630	0,93
800	0,98
1000	1,02
1250	1,05
1600	1,09
2000	1,08
2500	1,12
3150	1,14
4000	1,21
5000	1,29
Hz	

α_w = 0,80 (H)
classement : B

REVERBERATION TIME T

Date 18/01/08
Station ALPHA

TEST N° 2

f (Hz)	T of the empty room (s)	T of the room with sample (s)
100	11.94	6.05
125	11.56	5.36
160	11.27	4.64
200	10.40	4.36
250	10.34	4.31
315	10.87	4.12
400	10.17	3.46
500	9.65	3.11
630	9.08	2.79
800	8.45	2.63
1000	7.49	2.46
1250	6.87	2.34
1600	5.90	2.16
2000	5.26	2.06
2500	4.50	1.88
3150	3.65	1.67
4000	2.79	1.40
5000	2.21	1.18

DESCRIPTION AND INSTALLATION OF SUSPENDED CEILING

Test	3
Date	18/01/08
Station	ALPHA

REQUESTER, MANUFACTURER ROCKFON. ROCKWOOL A/S

NAME PANEL N° 53

APTITUDE IN THE EMPLOYMENT Unchecked

MAIN CHARACTERISTIC

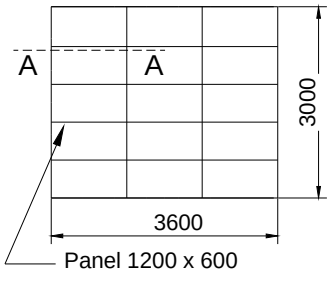
Dimensions of one panel in mm	: 1200 x 600
Thickness of one panel in mm	: 45
Weight per unit of area in kg/m²	: 7.4
Dimensions of sample in mm	: 3000 x 3600
Installation type	: E-245

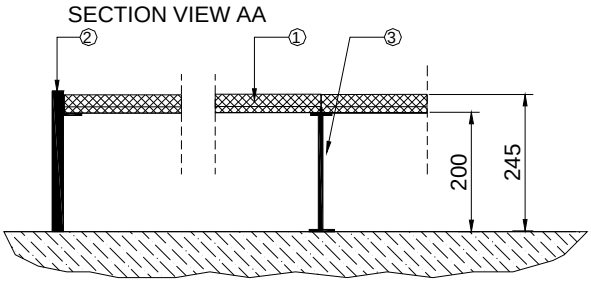
DESCRIPTION (dimensions are given in mm)

Panels		
Reference		2007-53
Dimensions		1200 x 600 x 45
Constitution	Type	Rockwool/membrane/rockwool
	Front panel	Nature : rockwool Thickness : 30 Density : 150 kg/m^3 (theoretical) painted front fleece
	Membrane	Aluminium
	Back panel	Nature : rockwool Thickness : 15 Density : 150 kg/m^3 (theoretical) back fleece
Front surface		Sonar surface (Structure paint)
Edge		A + edge paint

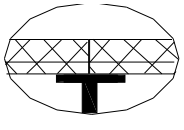
INSTALLATION

The Panels are laid side to side on a metal frame with an air space under panels of 200 mm in height. They are put on a 600 x 600 grid. This grid is composed of tees spaced at interval of 600 mm.





① Panel
② Metal frame
③ Support



Dimensions in mm

SOUND ABSORPTION COEFFICIENT α_s OF SUSPENDED CEILING

AA45

Test	3
Date	18/01/08
Station	ALPHA

REQUESTER, MANUFACTURER ROCKFON. ROCKWOOL A/S

NAME PANEL N° 53

APTITUDE IN THE EMPLOYMENT Unchecked

MAIN CHARACTERISTIC

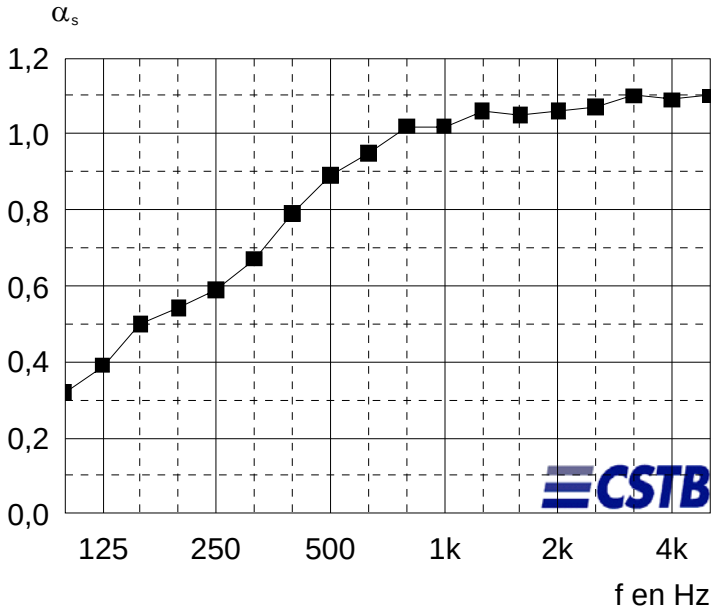
Dimensions of one panel in mm	: 1200 x 600
Thickness of one panel in mm	: 45
Weight per unit of area in kg/m²	: 7.4
Dimensions of sample in mm	: 3000 x 3600
Installation type	: E-245

CONDITIONS OF MEASUREMENT

EMPTY ROOM :
Temperature : 23 °C
Relative humidity : 46 %

ROOM WITH SAMPLE :
Temperature : 24 °C
Relative humidity : 48 %

RESULTS



f	α_s
100	0,32
125	0,39
160	0,50
200	0,54
250	0,59
315	0,67
400	0,79
500	0,89
630	0,95
800	1,02
1000	1,02
1250	1,06
1600	1,05
2000	1,06
2500	1,07
3150	1,10
4000	1,09
5000	1,10
Hz	

α_w = 0,90
classement : A

REVERBERATION TIME T

Date 18/01/08
Station ALPHA

TEST N° 3

f (Hz)	T of the empty room (s)	T of the room with sample (s)
100	11.17	5.70
125	11.55	5.25
160	11.47	4.53
200	10.30	4.12
250	10.39	3.95
315	10.82	3.66
400	10.19	3.22
500	9.75	2.93
630	9.16	2.75
800	8.59	2.56
1000	7.74	2.47
1250	7.12	2.35
1600	6.16	2.25
2000	5.55	2.16
2500	4.72	2.01
3150	3.80	1.81
4000	2.90	1.59
5000	2.22	1.37

DESCRIPTION AND INSTALLATION OF SUSPENDED CEILING

Test	4
Date	18/01/08
Station	ALPHA

REQUESTER, MANUFACTURER ROCKFON. ROCKWOOL A/S

NAME PANEL N° 54

APTITUDE IN THE EMPLOYMENT Unchecked

MAIN CHARACTERISTIC

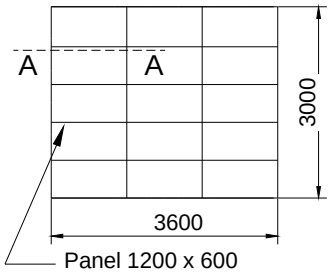
Dimensions of one panel in mm : 1200 x 600
Thickness of one panel in mm : 50
Weight per unit of area in kg/m² : 7.1
Dimensions of sample in mm : 3000 x 3600
Installation type : E-250

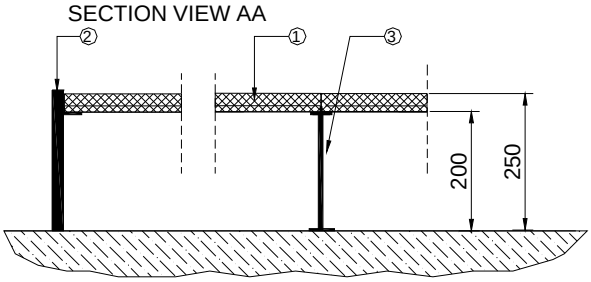
DESCRIPTION (dimensions are given in mm)

Panels		
Reference		2007-54
Dimensions		1200 x 600 x 50
Constitution	Type	Rockwool/membrane/rockwool - 9.614.00 PL
	Front panel	Nature : rockwool Thickness : 30 Density : 120 kg/m^3 (theoretical) painted front fleece
	Membrane	Aluminium
	Back panel	Nature : rockwool Thickness : 20 Density : 120 kg/m^3 (theoretical) back fleece
Front surface		Sonar Plan surface (Curtain coat)
Edge		A + edge paint

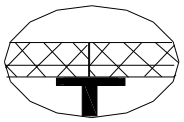
INSTALLATION

The Panels are laid side to side on a metal frame with an air space under panels of 200 mm in height. They are put on a 600 x 600 grid. This grid is composed of tees spaced at interval of 600 mm.





① Panel
② Metal frame
③ Support



Dimensions in mm

SOUND ABSORPTION COEFFICIENT α_s OF SUSPENDED CEILING

AA45

Test	4
Date	18/01/08
Station	ALPHA

REQUESTER, MANUFACTURER ROCKFON. ROCKWOOL A/S

NAME PANEL N° 54

APTITUDE IN THE EMPLOYMENT Unchecked

MAIN CHARACTERISTIC

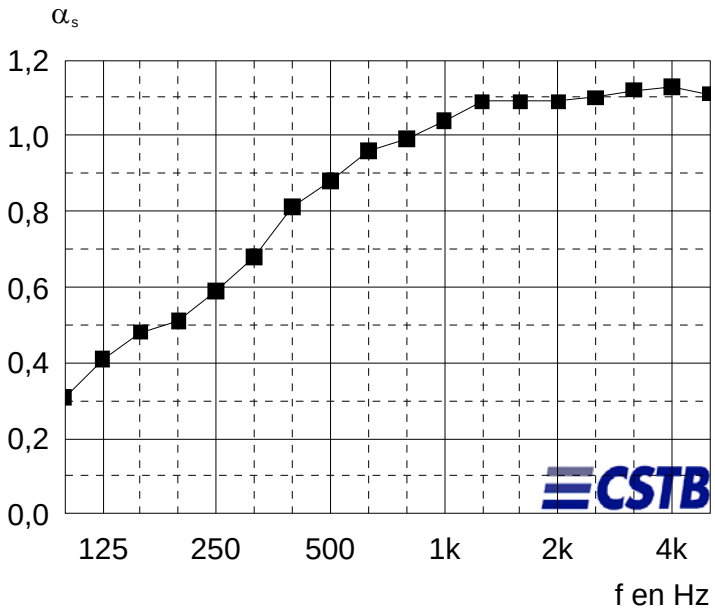
Dimensions of one panel in mm	: 1200 x 600
Thickness of one panel in mm	: 50
Weight per unit of area in kg/m²	: 7.1
Dimensions of sample in mm	: 3000 x 3600
Installation type	: E-250

CONDITIONS OF MEASUREMENT

EMPTY ROOM :
Temperature : 23 °C
Relative humidity :46 %

ROOM WITH SAMPLE :
Temperature : 24 °C
Relative humidity : 47 %

RESULTS



f	α_s
100	0,31
125	0,41
160	0,48
200	0,51
250	0,59
315	0,68
400	0,81
500	0,88
630	0,96
800	0,99
1000	1,04
1250	1,09
1600	1,09
2000	1,09
2500	1,10
3150	1,12
4000	1,13
5000	1,11
Hz	

α_w = 0,90
classement : A

REVERBERATION TIME T

Date 18/01/08
Station ALPHA

TEST N° 4

f (Hz)	T of the empty room (s)	T of the room with sample (s)
100	11.17	5.83
125	11.55	5.08
160	11.47	4.62
200	10.30	4.27
250	10.39	3.94
315	10.82	3.65
400	10.19	3.18
500	9.75	2.94
630	9.16	2.72
800	8.59	2.61
1000	7.74	2.45
1250	7.12	2.31
1600	6.16	2.20
2000	5.55	2.12
2500	4.72	1.98
3150	3.80	1.79
4000	2.90	1.56
5000	2.22	1.36

DESCRIPTION AND INSTALLATION OF SUSPENDED CEILING

Test	5
Date	14/01/08
Station	ALPHA

REQUESTER, MANUFACTURER ROCKFON. ROCKWOOL A/S

NAME Sonar Plan dB 44, Krios dB 44, Ekla dB 44

APTITUDE IN THE EMPLOYMENT Unchecked

MAIN CHARACTERISTIC

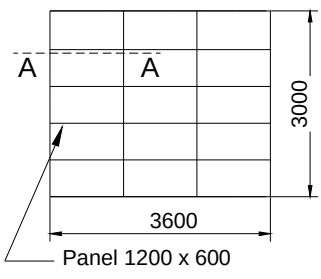
Dimensions of one panel in mm : 1200 x 600
Thickness of one panel in mm : 50
Weight per unit of area in kg/m² : 7.6
Dimensions of sample in mm : 3000 x 3600
Installation type : E-250

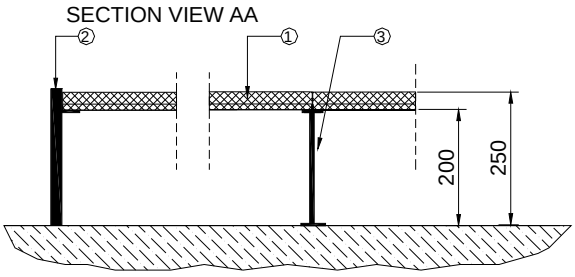
DESCRIPTION (dimensions are given in mm)

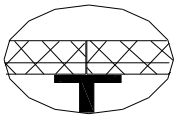
Panels		
Reference		Sonar Plan dB 44, Krios dB 44, Ekla dB 44
Dimensions		1200 x 600 x 50
Constitution	Type	Rockwool/membrane/rockwool - 9.613.00 PL
	Front panel	Nature : rockwool Thickness : 30 Density : 150 kg/m^3 (theoretical) painted front fleece
	Membrane	Aluminium
	Back panel	Nature : rockwool Thickness : 20 Density : 150 kg/m^3 (theoretical) back fleece
Front surface		Sonar Plan surface (Curtain coat)
Edge		A + edge paint

INSTALLATION

The Panels are laid side to side on a metal frame with an air space under panels of 200 mm in height. They are put on a 600 x 600 grid. This grid is composed of tees spaced at interval of 600 mm.







Dimensions in mm

① Panel
② Metal frame
③ Support

TEST REPORT N° AC08-26011628/3

SOUND ABSORPTION COEFFICIENT α_s OF SUSPENDED CEILING

AA45

Test	**5**
Date	**14/01/08**
Station	**ALPHA**

REQUESTER, MANUFACTURER **ROCKFON. ROCKWOOL A/S**

NAME **Sonar Plan dB 44, Krios dB 44, Ekla dB 44**

APTITUDE IN THE EMPLOYMENT **Unchecked**

MAIN CHARACTERISTIC

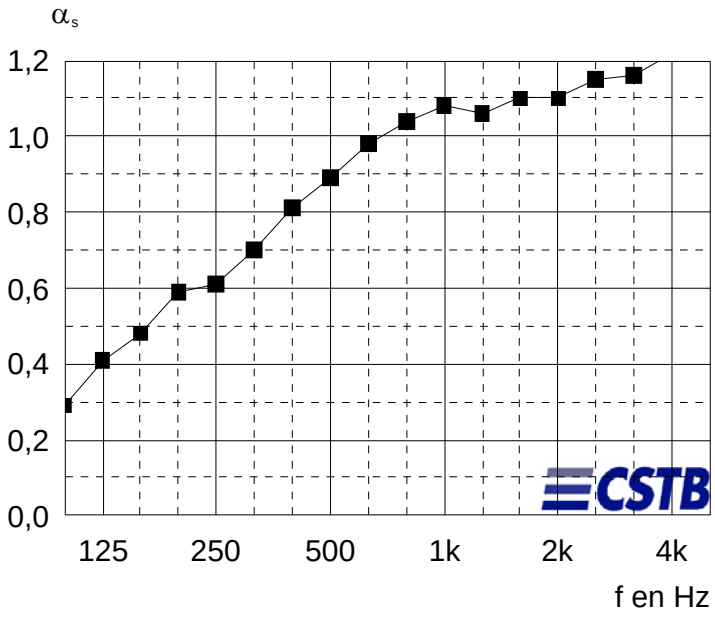
Dimensions of one panel in mm	: 1200 x 600
Thickness of one panel in mm	: 50
Weight per unit of area in kg/m²	: 7.6
Dimensions of sample in mm	: 3000 x 3600
Installation type	: E-250

CONDITIONS OF MEASUREMENT

EMPTY ROOM :
Temperature : 24 °C
Relative humidity : 39 %

ROOM WITH SAMPLE :
Temperature : 24 °C
Relative humidity : 34 %

RESULTS



f	α_s
100	0,29
125	0,41
160	0,48
200	0,59
250	0,61
315	0,70
400	0,81
500	0,89
630	0,98
800	1,04
1000	1,08
1250	1,06
1600	1,10
2000	1,10
2500	1,15
3150	1,16
4000	1,22
5000	1,33
Hz	

α_w = 0,90
classement : A

REVERBERATION TIME T

Date 14/01/08
Station ALPHA

TEST N° 5

f (Hz)	T of the empty room (s)	T of the room with sample (s)
100	11.94	6.15
125	11.56	5.07
160	11.27	4.59
200	10.40	3.92
250	10.34	3.83
315	10.87	3.58
400	10.17	3.18
500	9.65	2.93
630	9.08	2.69
800	8.45	2.53
1000	7.49	2.37
1250	6.87	2.32
1600	5.90	2.15
2000	5.26	2.04
2500	4.50	1.86
3150	3.65	1.67
4000	2.79	1.41
5000	2.21	1.18

TEST REPORT N° AC08-26011628/3

DESCRIPTION AND INSTALLATION OF SUSPENDED CEILING

Test	**6**
Date	**14/01/08**
Station	**ALPHA**

REQUESTER, MANUFACTURER **ROCKFON. ROCKWOOL A/S**

NAME **PANEL N° 56**

APTITUDE IN THE EMPLOYMENT **Unchecked**

MAIN CHARACTERISTIC

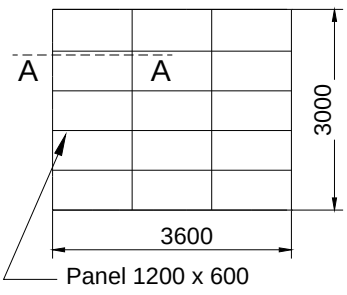
Dimensions of one panel in mm	: 1200 x 600
Thickness of one panel in mm	: 53
Weight per unit of area in kg/m²	: 8.6
Dimensions of sample in mm	: 3000 x 3600
Installation type	: E-253

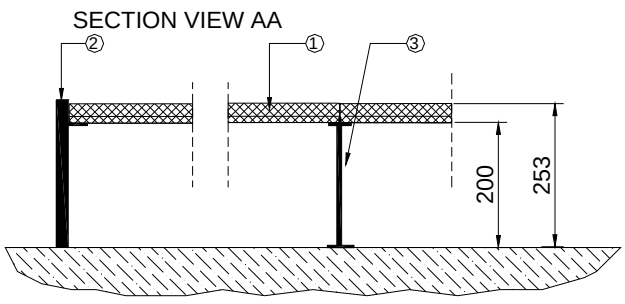
DESCRIPTION (dimensions are given in mm)

Panels		
Reference		2007-56
Dimensions		1200 x 600 x 53
Constitution	Type	Rockwool/membrane/rockwool - 9.615.00 PL
	Front panel	Nature : rockwool Thickness : 40 Density : 150 kg/m^3 (theoretical) painted front fleece
	Membrane	Aluminium
	Back panel	Nature : rockwool Thickness : 13 Density : 150 kg/m^3 (theoretical) back fleece
Front surface		Sonar Plan surface (Curtain coat)
Edge		A + edge paint

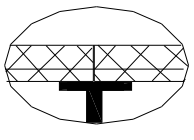
INSTALLATION

The Panels are laid side to side on a metal frame with an air space under panels of 200 mm in height. They are put on a 600 x 600 grid. This grid is composed of tees spaced at interval of 600 mm.





① Panel
② Metal frame
③ Support



Dimensions in mm

SOUND ABSORPTION COEFFICIENT α_s OF SUSPENDED CEILING

AA45

Test	6
Date	14/01/08
Station	ALPHA

REQUESTER, MANUFACTURER ROCKFON. ROCKWOOL A/S

NAME PANEL N° 56

APTITUDE IN THE EMPLOYMENT Unchecked

MAIN CHARACTERISTIC

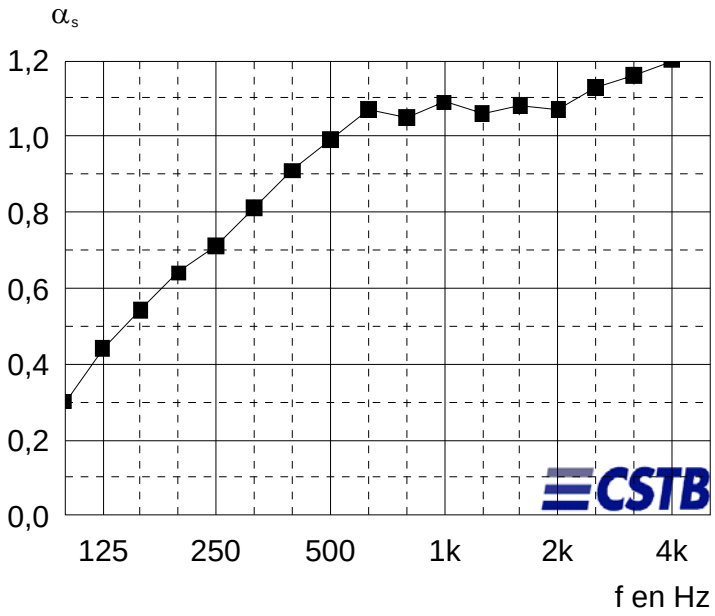
Dimensions of one panel in mm	: 1200 x 600
Thickness of one panel in mm	: 53
Weight per unit of area in kg/m²	: 8.6
Dimensions of sample in mm	: 3000 x 3600
Installation type	: E-253

CONDITIONS OF MEASUREMENT

EMPTY ROOM :
Temperature : 24 °C
Relative humidity : 39 %

ROOM WITH SAMPLE :
Temperature : 24 °C
Relative humidity : 34 %

RESULTS



f	α_s
100	0,30
125	0,44
160	0,54
200	0,64
250	0,71
315	0,81
400	0,91
500	0,99
630	1,07
800	1,05
1000	1,09
1250	1,06
1600	1,08
2000	1,07
2500	1,13
3150	1,16
4000	1,20
5000	1,31
Hz	

α_w = 1,00
classement : A

REVERBERATION TIME T

Date 14/01/08
Station ALPHA

TEST N° 6

f (Hz)	T of the empty room (s)	T of the room with sample (s)
100	11.94	6.11
125	11.56	4.91
160	11.27	4.27
200	10.40	3.73
250	10.34	3.47
315	10.87	3.24
400	10.17	2.93
500	9.65	2.72
630	9.08	2.52
800	8.45	2.50
1000	7.49	2.36
1250	6.87	2.32
1600	5.90	2.17
2000	5.26	2.08
2500	4.50	1.88
3150	3.65	1.67
4000	2.79	1.42
5000	2.21	1.19

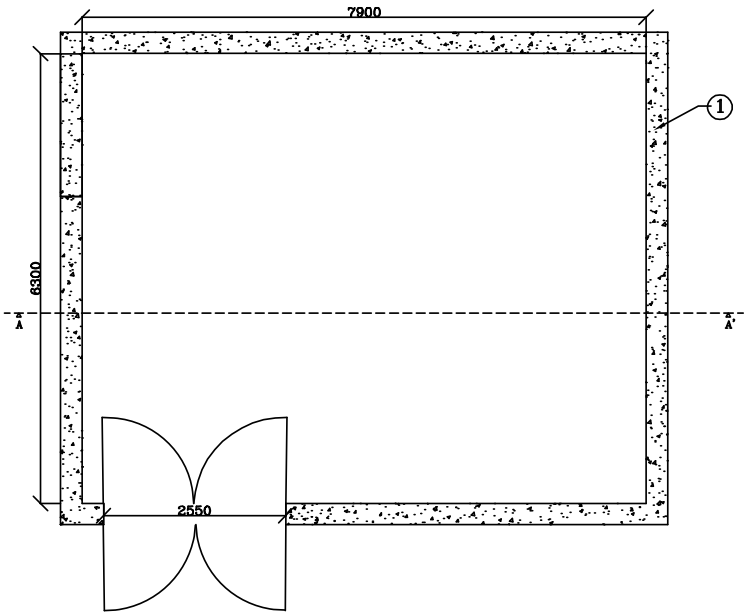
APPENDIX 1 – APPARATUS | STATION ALPHA

DESIGNATION	BRAND	TYPE	N° CSTB
Microphone network	Bruël & Kjær Bruël & Kjær	Microphone 4166 Préamplificateur 2669	CSTB 01 0221
Microphone network	Bruël & Kjær Bruël & Kjær	Microphone 4166 Préamplificateur 2669	CSTB 04 1519
Rotating arm	Bruël & Kjær	3923	CSTB 97 0162
Amplifier	CARVER	PM600	CSTB 91 0119
Speaker	CSTB-ELECTRO VOICE	Pyramide	CSTB 97 0208
Speaker	CSTB-ELECTRO VOICE	Pyramide	CSTB 97 0205
Real Time Analyser	Bruël & Kjær	2144	CSTB 00 0145
Microcomputer	DELL	OPTIPLEX GX 270	
Calibrator	Bruël & Kjær	4231	CSTB 04 1839

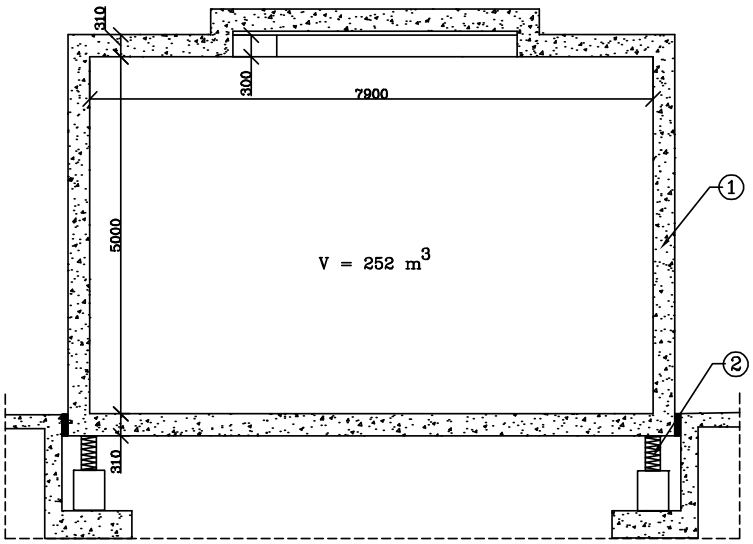
Script of measurement: 6 positions for every microphone (2 microphones) and for every speaker (2 fixed speakers).

APPENDIX 2 – DRAWING OF THE TEST STATION | STATION ALPHA

PLAN



COUPE AA'



dimensions en mm

		échelle: 1/100
	Poste d'essais équipé de 12 diffuseurs :	POSTE ALPHA (ABSORPTION)
	7 diffuseurs de 2,05x1,05 m, 4 diffuseurs de 2x1,20 m et 1 diffuseur de 3x1,05 m	
2	Boîte à ressort	
1	Béton	ACOUSTIQUE
REP	DESIGNATION	

END OF REPORT