SIA * R & D AKUSTIKA *

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LATVIJAS REPUBLIKA, LV - 1067, RĪGA, KURZEMES PROSPEKTS 3, *Reģistr. Nr. :* **LV 010310045**
Fax. +371 67815008, ☎ **371 67815007** **mob. ☎ +371 29217605 ,** E-mail: **rd.akustika@apollo.lv**

CUSTOMER: AEROC AS (Estonia)

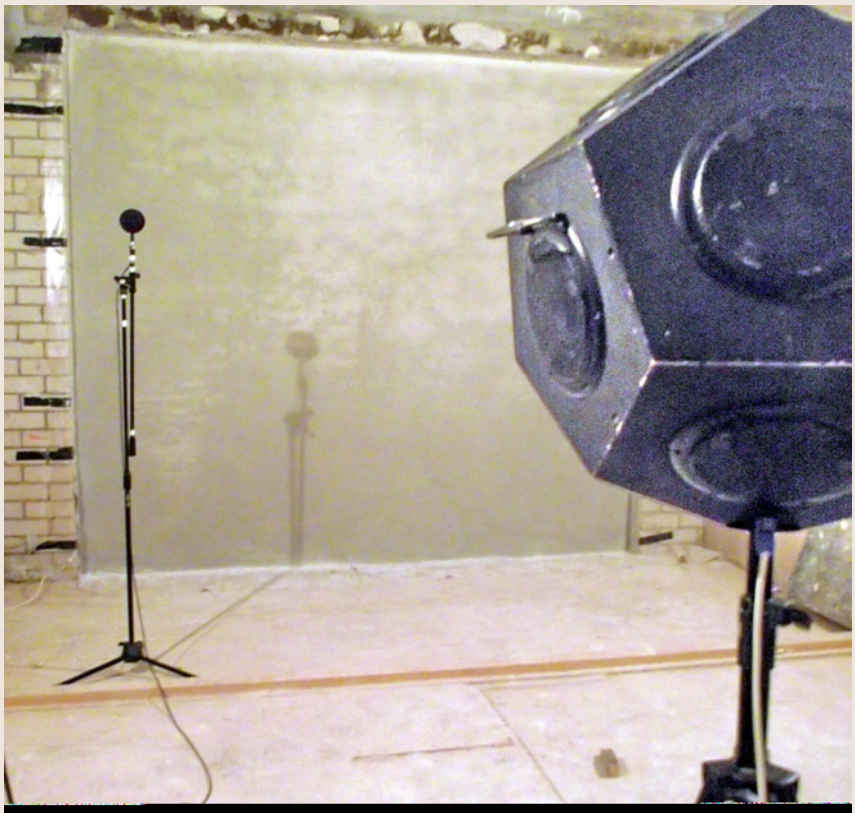
"C O N F I R M"
Director "R & D Akustika" Ltd.

_____/ J. SAPROVSKIS /

September 16, 2011.

Test Report of laboratory Sound Insulation measurements

Nr. 569 / 2011 – AL 8.4



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RIGA – 2011

Testing report No 569/2011–AL8.4

MEASUREMENTS CARRIED OUT BY: LATAK -T-282

"R & D Akustika" Ltd.
Acoustics laboratory
3 Kurzemes avenue.

Leading metrologies: **U. Ķipēns** _____ 29.08.2011.

REPORT (on 16 pages) COMPILED BY:
Manager of Acoustics laboratory: **Dz. Lasis** _____ 31.08.2011.

TESTING CUSTOMER: **AEROC AS (Estonia)**

THE OBJECTS UNDER TEST:

Table 1. Wall samples built in the Building acoustics Chamber's test opening

No.	Sample registr. No.	Construction type	Construction individuality by layers
1.	**506-1**	*Dividing wall (see Supplement 7)*	*1) AEROC Hard blocks 250 mm,*
2.	**506-2**	*Plastered dividing wall (see Supplement 7)*	*1) Inner plastering KNAUF MP-75 10 mm,* *2) AEROC Hard blocks 250 mm,* *3) Inner plastering KNAUF MP-75 10 mm,*
3.	**506-3**	*Plastered dividing wall (see Supplement 7)*	*1) Inner plastering KNAUF MP-75 20 mm,* *2) AEROC Hard blocks 250 mm,* *3) Inner plastering KNAUF MP-75 20 mm,*
4.	**506-4**	*Double dividing wall (see Supplement 7)*	*1) AEROC Hard blocks 150 mm,* *2) ISOVER rock-wool OL-A 30 mm,* *3) Air intermediate layer 20 mm,* *4) AEROC Element 100 mm,*
5.	**506-5**	*Plastered double dividing wall (see Supplement 7)*	*1) Inner plastering KNAUF MP-75 10 mm,* *2) AEROC Hard blocks 150 mm,* *3) ISOVER rock-wool OL-A 30 mm,* *4) Air intermediate layer 20 mm,* *5) AEROC Element 100 mm,* *6) Inner plastering KNAUF MP-75 10 mm,*
6.	**506-6**	*Plastered double dividing wall (see Supplement 7)*	*1) Inner plastering KNAUF MP-75 20 mm,* *2) AEROC Hard blocks 150 mm,* *3) ISOVER rock-wool OL-A 30 mm,* *4) Air intermediate layer 20 mm,* *5) AEROC Element 100 mm,* *6) Inner plastering KNAUF MP-75 20 mm,*

MEASUREMENT TIME, CONDITIONS AND PLACE:

Table 2.

No	Time	Record No	Conditions	In the beginning	At the end	Place
1.	August 03. 2011.	Protocol Nr.A153/ 2011-AL8.3	Air temperature: Relative humidity: Atm. pressure:	+ 19±0,5° C 72±4 % 765 ±0,5 mmHg	+ 19±0,5° C 72±4 % 765 ±0,5 mmHg	In the building acoustics chamber
2.	August 08. 2011.	Protocol Nr.A153/ 2011-AL8.3	Air temperature: Relative humidity: Atm. pressure:	+ 21±0,5° C 71±4 % 753 ±0,5 mmHg	+ 21±0,5° C 71±4 % 753 ±0,5 mmHg	In the building acoustics chamber
3.	August 13. 2011.	Protocol Nr.A153/ 2011-AL8.3	Air temperature: Relative humidity: Atm. pressure:	+ 18±0,5° C 87±4 % 757 ±0,5 mmHg	+ 18±0,5° C 87±4 % 757 ±0,5 mmHg	In the building acoustics chamber
4.	August 19. 2011.	Protocol Nr.A153/ 2011-AL8.3	Air temperature: Relative humidity: Atm. pressure:	+ 18±0,5° C 75±4 % 757 ±0,5 mmHg	+ 18±0,5° C 75±4 % 757 ±0,5 mmHg	In the building acoustics chamber
5.	August 22. 2011.	Protocol Nr.A153/ 2011-AL8.3	Air temperature: Relative humidity: Atm. pressure:	+ 18±0,5° C 78±4 % 761 ±0,5 mmHg	+ 18±0,5° C 78±4 % 761 ±0,5 mmHg	In the building acoustics chamber
6.	August 26. 2011.	Protocol Nr.A153/ 2011-AL8.3	Air temperature: Relative humidity: Atm. pressure:	+ 19±0,5° C 83±4 % 765 ±0,5 mmHg	+ 19±0,5° C 83±4 % 765 ±0,5 mmHg	In the building acoustics chamber

TEST AIMED AT:

1. To obtain frequency responses of sound reduction index, ***R*** for above mentioned wall samples (see Table 1) in accordance with standard ISO 10140 (all 5 Parts) requirements.
2. Having regard of measurement results (see point 1) to make calculations of weighted sound reduction index, R_w (C,C_{tr}) in accordance with standard ISO 717-1 conditions.
3. To give assessment of measurements and calculations.

MEASUREMENT EQUIPMENT:

Table 3.

No	Hardware or Software	Type / Serial No.	Producer or Distributor	Meas. equip. class	Date of Calibra-tion	Calibration Institution / No. of Certificate / Traceability	Date of Recalibra-tion
1.	Sound Calibrator	1253 / 31053	Norsonic	0	2011.g. 7.jūl.	Norsonic Calibr.labor./ CAL 022-2011-2878 / PTB; IKM	2013.g. 7.jūl.
2.	Barometer	MKD / 02094	Fischer	-	2010.g. 9.feb.	LVĢMC / S-011\1002 / METEO FRANCE	2013.g. 9.feb.
3.	Hygrometer	- / 02174	Klīva	-	2010.g. 9.feb.	LVĢMC / H-087\1002 / NPL	2013.g. 9.feb.
4.	Thermometer	TC-7-M1 / 03445	Klīva	-	2008.g. 19.feb.	LVĢMA / T-110\0802 / NPL	2012.g. 19.feb.
5.	Measuring ruler	- / 3143 \ AL004M	Kalibrs	-	2006.g. 8.mar.	LNMC / G0396K06 / MIKES	2012.g. 8.mar.
6.	Modular Precision Sound Analyzer	2260 Inve-stigator / 2375668	B&K	1	2009.g. 7.jūl.	B&K Calibr. labor. / C0905849 / DANAK 22; DANAK 307	2012.g. 7.jūl.
7.	Microphone	4189 / 2385662	B&K	0	2009.g. 7.jūl.	B&K Calibr. labor. / C0905849 / DANAK 22; DANAK 307	2012.g. 7.jūl.
8.	Microphone	4189 / 2542927	B&K	0	2009.g. 7.jūl.	B&K Calibr. labor. / C0905853 / ATC; B&K; DPLA; NPL; PTB	2012.g. 7.jūl.
9.	Power Amplifier	2716C / 2533865	B&K	-	-	-	-
10.	Omnidirectional Loudspeaker	UD-12\1 / -	R&D Akustika	-	-	-	-
11.	Software	7830 Qualifier / 2536421	B&K	-	-	-	-

In Table 3 used abbreviations :

ATC - ”Agilent Technologies”,(USA) ;
B&K - “Brüel & Kjær”, (Denmark) ;
DANAK - Danish Accreditation & Metrology Fund;
DFM - Danish Fundamental Metrology ;
DPLA - Danish Primary Laboratory of Acoustics ;
IKM - IKM Laboratorium (Norway) ;
LVĢMA - Latvian Environment, Geology and Meteorology Agency ;
LNMC - Latvian National Metrology Centre ;
MIKES - Centre for Metrology and Accreditation, (Finland) ;
NIST - National Institute of Standards and Technology, (USA) ;
NPL - National Physical Laboratory, (Great Britain) ;
PTB - Physikalisch-Technischen Bundesanstalt, (Germany) .

TEST METHOD:

Test method is given in standard ISO 10140-4 and short recital follows.

Sample No 506-1(see Supplement 7) is being built in test opening (with contact surface - S_S) of Building acoustics chamber (see Fig.1) as it is described in next chapter.

For built in sample by noise signal in **1/3** octave bands (in range from 50 to 10000 Hz) following parameters are being measured:

1. Mean sound pressure level ($L_{Aeq,T}$) in secondary room (meant of 10-15 measures).
2. $L_{Aeq,T}$ in primary (see Fig. on front page) room (meant of 10-15 measures).
3. Average standard reverberation time in secondary room (meant of 5 measures).

From this measurements and additionally take in account volume of secondary room V_S, has calculated sound reduction index R .

Fig.1. Built in of the sample No. 506-1 in the building acoustics chamber's test opening.

SITUATION OF MEASUREMENTS:

Measurements have been made in Building acoustics chamber with dimensions

of primary sound field room :

- Width – 4,3 m;
- Length (* ~5,0 m;
- Height – 3,3 m;
- Volume (* ~71,0 m^3,

and secondary sound field room:

- Width – 4,3 m;
- Length (* ~4,7 m;
- Height – 3,3 m;
- Volume (* ~68,0 m^3.

*) These parameters should be varied due to various thickness and displacement of wall samples in the test opening.

Wall samples built in the acoustic chambers test opening frame (see Fig.1.) forms contact surface S_S = 9,9 m^2 between both rooms.

Fig.2. Sample No. 506-1 plastering to make the sample No. 506-2 (view from primary sound room).

Five microphone positions (see Supplement 8) in both (primary and secondary) rooms are used. Two or three positions of dodecahedron omni-directional sound source in primary room are used. It makes situation of 10 or 15 measurement positions of $L_{Aeq,T}$ in every room, which provides necessary conditions of diffuse sound field. Diffuse field conditions are improved by diffusing elements. Samples from No. 506-1 till No. 506-6 are built in the chamber's test opening frame (see Fig.1 - 3) and after that are carry out all measurements (see Fig. on front page and Fig.4).

In secondary sound field room acoustical system is being placed (see Fig.4). It is used for standard reverberation time; - T_S measurements. T_S is measured by firm's "Brüel & Kjær" software BZ 7204 by „2260 Investigator". Example of T_S (T2) measurements see in Fig.5.

RESULTS OF MEASUREMENTS:

Fig.3. Situation in the primary sound field room in the time of building of sample No 506-4.

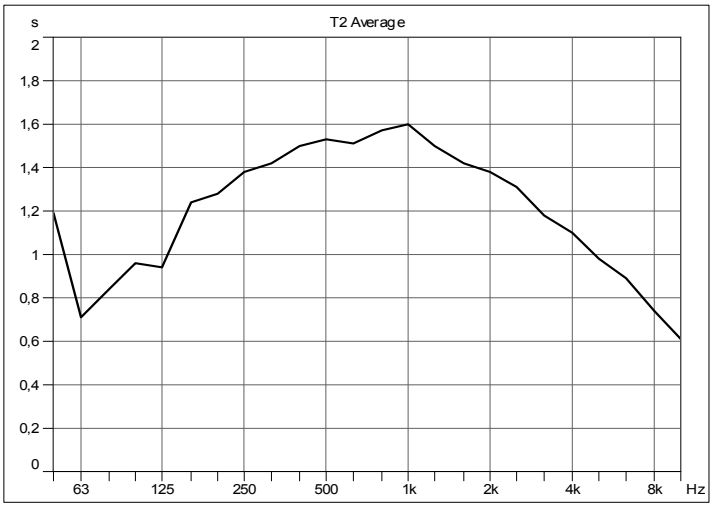


Fig.5. Reverberations time values in the secondary sound field for sample No 506-6.

Fig.4. Situation in primary sound field room in the time of sound pressure measurements for sample No 506-6.

Full measurement's results are given in protocol **No A153/2011–AL8.3.** Situation scheme see in Supplement 8.

Frequency responses of sound reduction index; - R are given in Supplement 1 - 6. Weighted sound reduction indexes, R_w (C,C_{tr}) in accordance with standard ISO 717-1 are given in Table 5.

Calculation of relevant spectrum adaptation terms (C,C_{tr}) (see Table 4 and Fig.6) is explained more specified.

Table 4

Type of noise source	Relevant spectrum adaptation form
Living activities (talking, music, radio, TV) Children playing Railway traffic at medium and high speed Highway road traffic > 80 km/h Jet aircraft, short distance Factories emitting mainly medium and high frequency noise	C [spectrum Nr.1 (see Fig.6)] (j=1)
Urban road traffic Railway traffic at low speeds Aircraft, propeller driven Jet aircraft, large distance Disco music Factories emitting mainly low and medium frequency noise	C_{tr} [spectrum Nr.2 (see Fig.6)] (j=2)

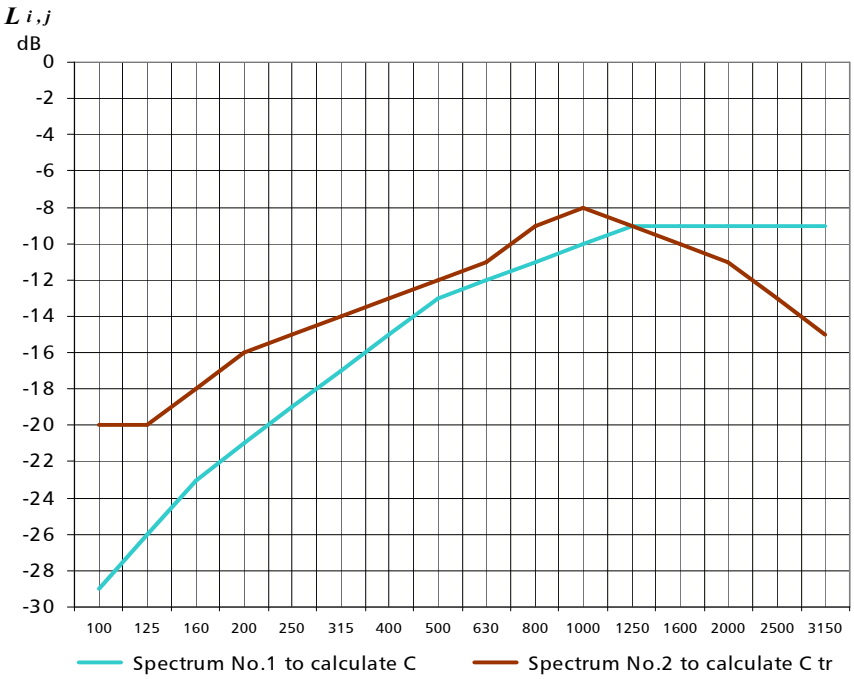


Fig.6. Sound pressure spectra (relevant spectrum forms – j) to calculate the spectrum adaptation terms (C,C_{tr}) for R_w measurements using 1/3 octave bands (see Table 4) .

R_w adaptation terms' (C,C_{tr}) calculations (see standard ISO 717-1) performed by formula:

$$C_j = X_{Aj} - R_w \quad ; - \{\textit{and rounded to a nearest integer}\} \qquad (1)$$, where

R_w – weighted sound reduction index (see Supplement 1 - 6) ;

X_{Aj} – is calculated for relevant spectrum form – j (see Fig.6) by formula:

$$X_{Aj} = -10\lg \sum_{i=1}^{n} 10^{\frac{L_{ij} - R_i}{10}} \qquad (2)$$, where

L_{ij} – relevant spectrum form – j (see Fig.6) level at the i 1/3 octave band ;

R_i – R value at the i 1/3 octave band (see Supplement 1 - 6) .

R_w adaptation terms' (C,C_{tr}) values see in Table 5 in next chapter.

Table 5 Weighted sound reduction indexes, R_w (C,C_{tr})

in accordance with standard ISO 717-1

No.	Sample registration No.	Weighted Sound reduction index R_w	Adaptation term C	Adaptation term C_{tr}
1.	506 – 1	**46 dB**	**– 1 dB**	**– 3 dB**
2.	506 – 2	**49 dB**	**– 1 dB**	**– 3 dB**
3.	506 – 3	**50 dB**	**– 1 dB**	**– 3 dB**
4.	506 – 4	**60 dB**	**– 1 dB**	**– 5 dB**
5.	506 – 5	**61 dB**	**– 2 dB**	**– 6 dB**
6.	506 – 6	**61 dB**	**– 2 dB**	**– 6 dB**

ASSESSMENT OF MEASUREMENT RESULTS: (*:

After comparing all measurement results (see Table 5) we can conclude:

1. Obtained R_w value for all samples is better than prognosticate value and it can be apply as inter-apartment dividing or apartment dividing wall (in accordance with building regulations).

“R & D Akustika“ Ltd. expert, dipl. eng.,

LAA sert.003/02 Dz. Lasis

Note: *) This assessment of measurement results is Acoustics laboratory view and explanation and is not given as laboratory accredited action.

Testing report No 569/2011–AL8.4

Supplement 1

Sound reduction index, R , according to EN ISO 140-3
Laboratory measurements of airborne sound insulation of building elements

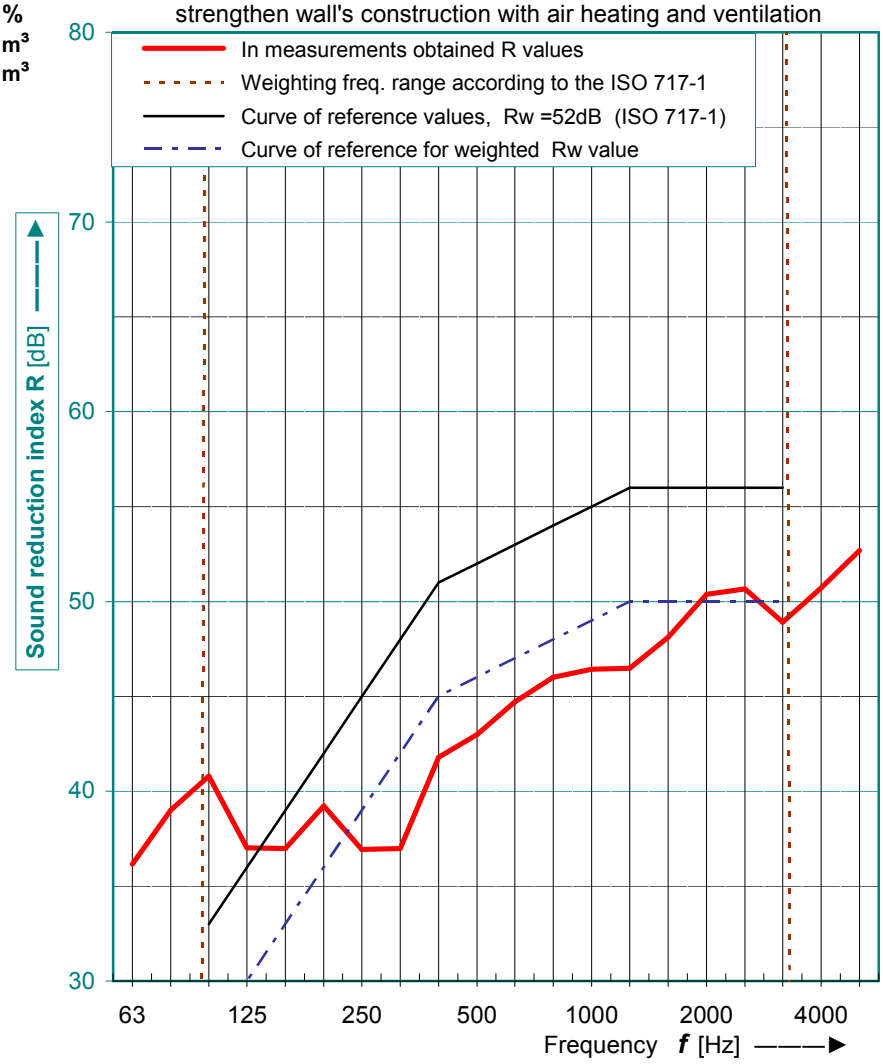
Manufacturer :	AEROC AS Estonia	**Sample identific. :**	No. 506-1
Client :	AEROC AS Estonia	**Test room identific. :**	Lab.T-282 Building acoust.chamber
Test specimen mounted by :	AEROC AS Estonia	**Date of test :**	August 03, 2011

Description of test specimen and arrangement: Dividing wall — ***1) AEROC Hard blocks 250mm***

Area ***S*** of test specimen : **9,9 m²**
Mass per unit area : **144 kg/m²**
Air temp. In the test rooms : **19,0 °C**
Air humidity in the test rooms : **72,0 %**
Source room volume : **71,0 m³**
Receiving room volume : **68,3 m³**

Measurements were performed a day after sample building and strengthen wall's construction with air heating and ventilation

Frequency ***f*** [Hz]	***R*** ⅓ octave [dB]
50	31,9
63	36,2
80	39,0
100	40,8
125	37,0
160	37,0
200	39,2
250	36,9
315	37,0
400	41,8
500	43,0
630	44,7
800	46,0
1000	46,4
1250	46,5
1600	48,1
2000	50,4
2500	50,7
3150	48,9
4000	50,7
5000	52,7
6300	54,1
8000	55,3
10000	57,03



Weighted sound reduction index, ***R*** w (***C***;***C*** tr), rating according to EN ISO 717-1:

R w (C;C tr) = 46 (-1 ; -3) dB

C 50-3150 = **-1 dB** ***C*** 50-5000 = **0 dB** ***C*** 100-5000 = **0 dB**

C tr 50-3150 = **-3 dB** ***C*** tr 50-5000 = **-3 dB** ***C*** tr 100-5000 = **-3 dB**

Evaluation based on laboratory measurement results obtained by an engineering method

"R&D Akustika" Ltd Acoustics laboratory T-282

Date : 2011.08.29.

Signature :

Testing report No 569/2011–AL8.4

Supplement 2

Sound reduction index, R , according to EN ISO 140-3
Laboratory measurements of airborne sound insulation of building elements

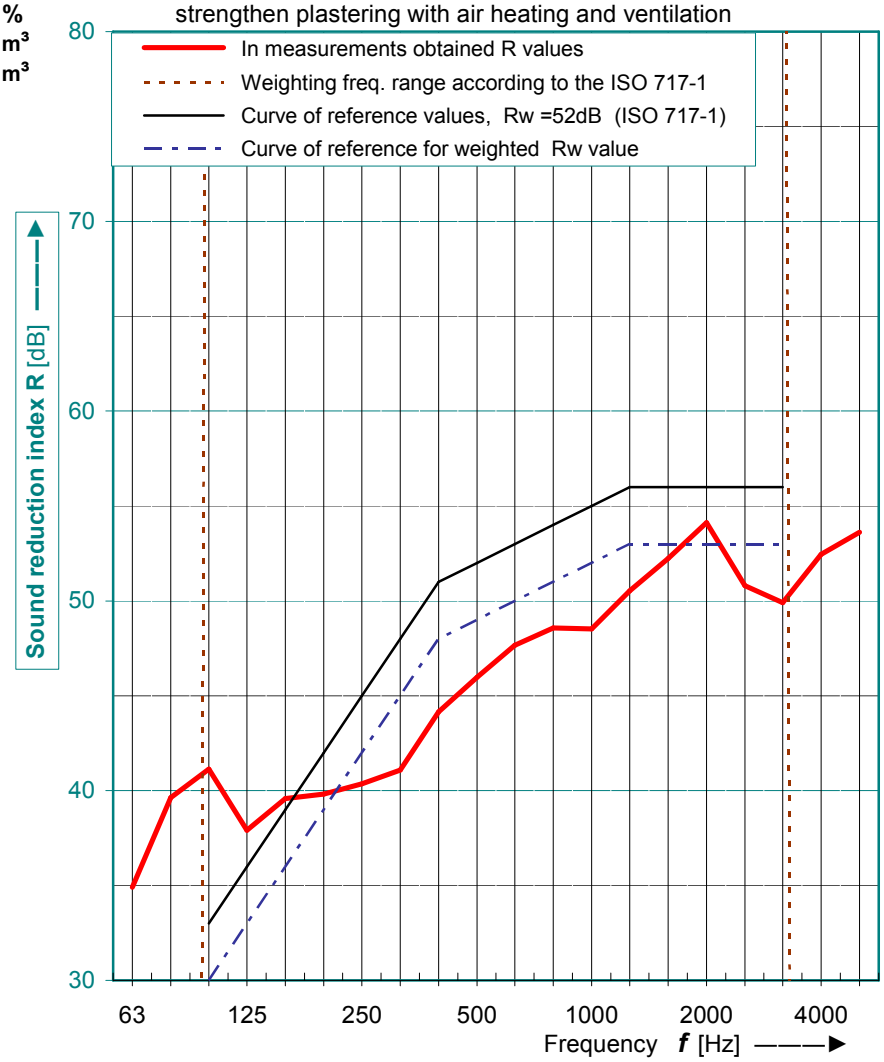
Manufacturer :	AEROC AS Estonia	**Sample identific. :**	No. 506-2
Client :	AEROC AS Estonia	**Test room identific. :**	Lab.T-282 Building acoust.chamber
Test specimen mounted by :	AEROC AS Estonia	**Date of test :**	August 08, 2011

Description of test specimen and arrangement: Dividing wall — ***1) Inner plastering KNAUF MP-75 10mm,***
2) AEROC Hard blocks 250mm,
3) Inner plastering KNAUF MP-75 10mm

Area ***S*** of test specimen : **9,9 m²**
Mass per unit area : **162 kg/m²**
Air temp. In the test rooms : **21,0 °C**
Air humidity in the test rooms : **71,0 %**
Source room volume : **71,0 m³**
Receiving room volume : **68,2 m³**

Measurements were performed a 3 days after sample plastering and strengthen plastering with air heating and ventilation

Frequency ***f*** [Hz]	***R*** ⅓ octave [dB]
50	29,7
63	34,9
80	39,6
100	41,1
125	37,9
160	39,6
200	39,8
250	40,4
315	41,1
400	44,1
500	46,0
630	47,7
800	48,6
1000	48,5
1250	50,5
1600	52,2
2000	54,1
2500	50,8
3150	49,9
4000	52,5
5000	53,6
6300	55,5
8000	57,7
10000	58,80



Weighted sound reduction index, ***R*** w (***C***;***C*** tr), rating according to EN ISO 717-1:

R w (C ; C tr) = 49 (-1 ; -3) dB

C 50-3150 = **-1 dB** ***C*** 50-5000 = **0 dB** ***C*** 100-5000 = **0 dB**

Evaluation based on laboratory measurement results obtained by an engineering method

C tr 50-3150 = **-4 dB** ***C*** tr 50-5000 = **-4 dB** ***C*** tr 100-5000 = **-3 dB**

"R&D Akustika" Ltd Acoustics laboratory T-282

Date : 2011.08.29.

Signature :

Testing report No 569/2011–AL8.4

Supplement 3

Sound reduction index, R , according to EN ISO 140-3
Laboratory measurements of airborne sound insulation of building elements

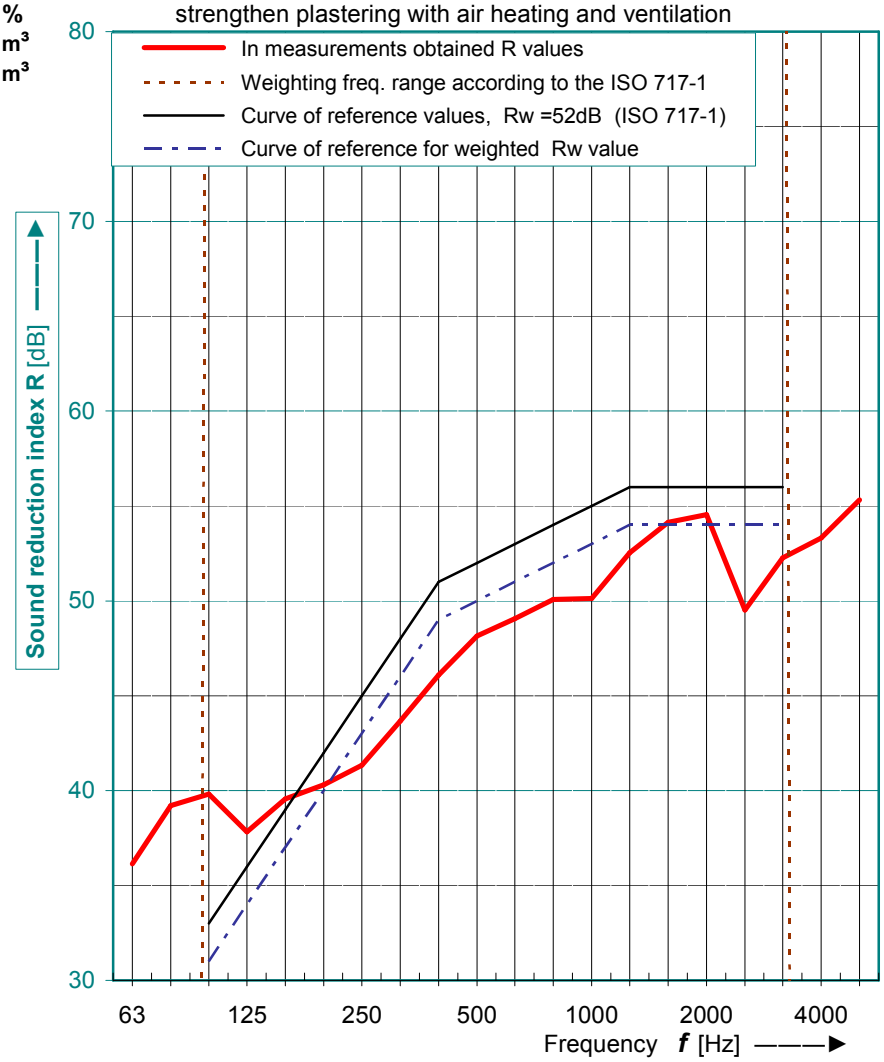
Manufacturer :	AEROC AS Estonia	**Sample identific. :**	No. 506-3
Client :	AEROC AS Estonia	**Test room identific. :**	Lab.T-282 Building acoust.chamber
Test specimen mounted by :	AEROC AS Estonia	**Date of test :**	August 13, 2011

Description of test specimen and arrangement: Dividing wall — ***1) Inner plastering KNAUF MP-75 20mm,***
2) AEROC Hard blocks 250mm,
3) Inner plastering KNAUF MP-75 20mm

Area ***S*** of test specimen : **9,9 m²**
Mass per unit area : **180 kg/m²**
Air temp. In the test rooms : **18,0 °C**
Air humidity in the test rooms : **87,0 %**
Source room volume : **71,0 m³**
Receiving room volume : **68,0 m³**

Measurements were performed a 4 days after sample plastering and strengthen plastering with air heating and ventilation

Frequency ***f*** [Hz]	***R*** ⅓ octave [dB]
50	29,6
63	36,2
80	39,2
100	39,8
125	37,8
160	39,6
200	40,3
250	41,3
315	43,7
400	46,1
500	48,2
630	49,1
800	50,1
1000	50,1
1250	52,5
1600	54,1
2000	54,6
2500	49,5
3150	52,3
4000	53,3
5000	55,3
6300	56,7
8000	58,3
10000	59,79



Weighted sound reduction index, ***R*** w (***C***;***C*** tr), rating according to EN ISO 717-1:

R w (C ; C tr) = 50 (-1 ; -3) dB

C 50-3150 = **-1 dB** ***C*** 50-5000 = **0 dB** ***C*** 100-5000 = **0 dB**

Evaluation based on laboratory measurement results obtained by an engineering method

C tr 50-3150 = **-4 dB** ***C*** tr 50-5000 = **-4 dB** ***C*** tr 100-5000 = **-3 dB**

"R&D Akustika" Ltd Acoustics laboratory T-282

Date : 2011.08.29.

Signature :

Testing report No 569/2011–AL8.4

Supplement 4

Sound reduction index, R , according to EN ISO 140-3
Laboratory measurements of airborne sound insulation of building elements

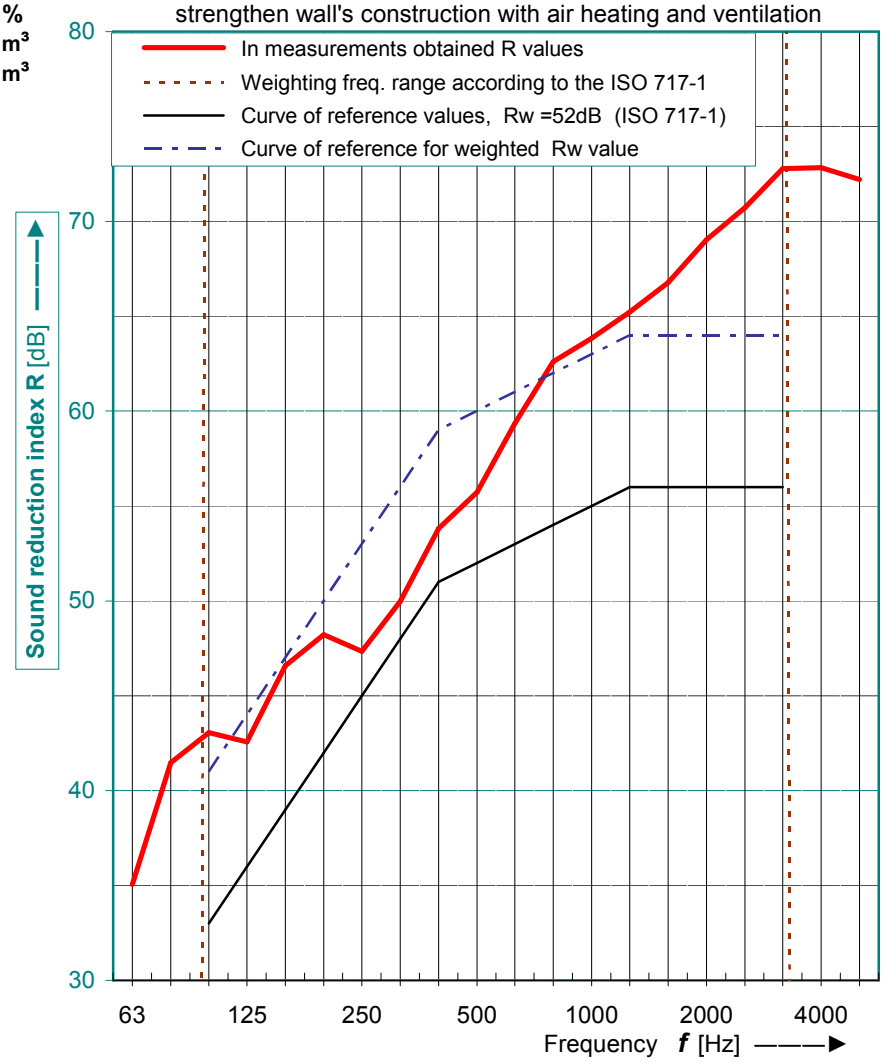
Manufacturer :	AEROC AS Estonia	**Sample identific. :**	No. 506-4
Client :	AEROC AS Estonia	**Test room identific. :**	Lab.T-282 Building acoust.chamber
Test specimen mounted by :	AEROC AS Estonia	**Date of test :**	August 19, 2011

Description of test specimen and arrangement: Double dividing wall — ***1) AEROC Hard blocks 150mm, 2) ISOVER rock-wool OL-A 30mm, 3) Air intermediate layer 20mm, 4) AEROC Element 100mm***

Area ***S*** of test specimen : **9,9 m²**
Mass per unit area : **133 kg/m²**
Air temp. In the test rooms : **18,0 °C**
Air humidity in the test rooms : **75,0 %**
Source room volume : **71,0 m³**
Receiving room volume : **67,8 m³**

Measurements were performed a day after sample building and strengthen wall's construction with air heating and ventilation

Frequency ***f*** [Hz]	***R*** ⅓ octave [dB]
50	29,8
63	35,1
80	41,5
100	43,1
125	42,6
160	46,6
200	48,2
250	47,3
315	50,0
400	53,8
500	55,7
630	59,3
800	62,6
1000	63,8
1250	65,2
1600	66,8
2000	69,0
2500	70,7
3150	72,8
4000	72,8
5000	72,2
6300	71,7
8000	71,3
10000	69,76



Weighted sound reduction index, ***R*** w (***C***;***C*** tr), rating according to EN ISO 717-1:

R w (C ; C tr) = 60 (-1 ; -5) dB

C 50-3150 = **-2 dB** ***C*** 50-5000 = **-1 dB** ***C*** 100-5000 = **0 dB**

Evaluation based on laboratory measurement results obtained by an engineering method

C tr 50-3150 = **-9 dB** ***C*** tr 50-5000 = **-9 dB** ***C*** tr 100-5000 = **-5 dB**

"R&D Akustika" Ltd Acoustics laboratory T-282

Date : 2011.08.29.

Signature :

Testing report No 569/2011–AL8.4

Supplement 5

Sound reduction index, R , according to EN ISO 140-3
Laboratory measurements of airborne sound insulation of building elements

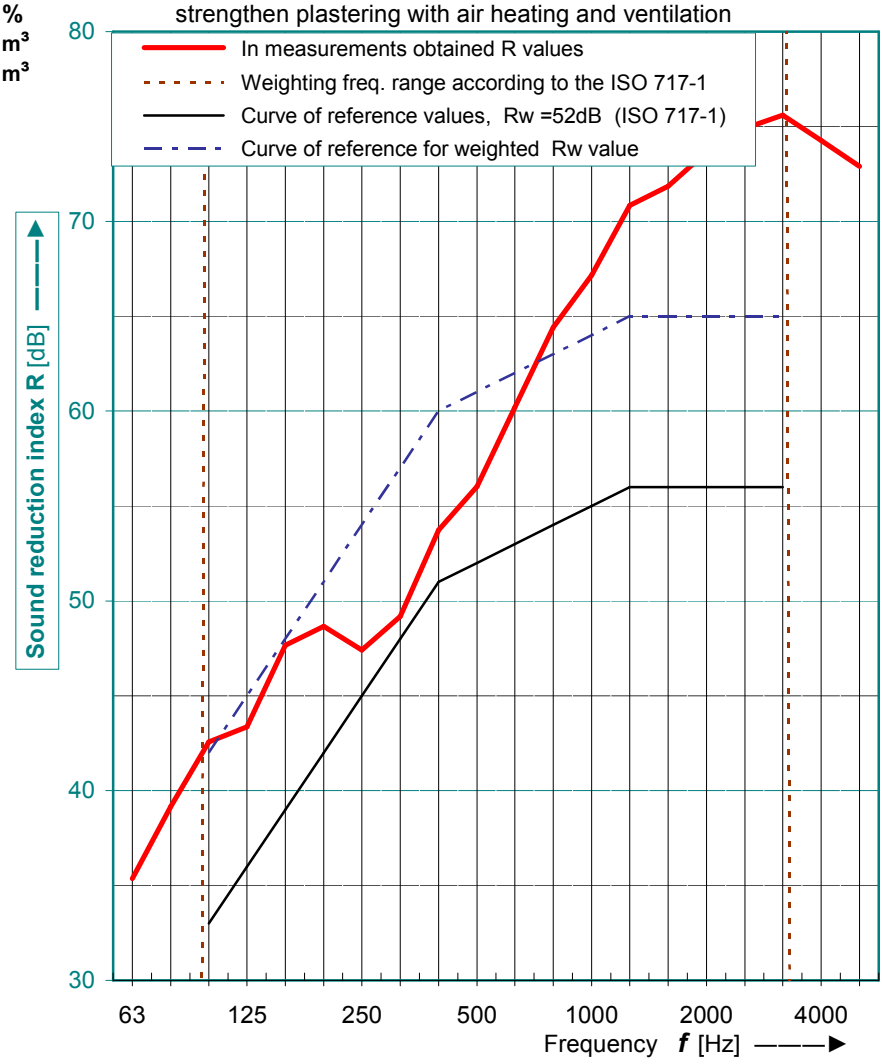
Manufacturer :	AEROC AS Estonia	**Sample identific. :**	No. 506-5
Client :	AEROC AS Estonia	**Test room identific. :**	Lab.T-282 Building acoust.chamber
Test specimen mounted by :	AEROC AS Estonia	**Date of test :**	August 22, 2011

Description of test specimen and arrangement: Double dividing wall — ***1) Inner plastering KNAUF MP-75 10mm, 2) AEROC Hard blocks 150mm, 3) ISOVER rock-wool OL-A 30mm, 4) Air intermediate layer 20mm, 5) AEROC Element 100mm 6) Inner plastering KNAUF MP-75 10mm***

Measurements were performed a 3 days after sample plastering and strengthen plastering with air heating and ventilation

Area ***S*** of test specimen : **9,9 m²**
Mass per unit area : **151 kg/m²**
Air temp. In the test rooms : **18,0 °C**
Air humidity in the test rooms : **78,0 %**
Source room volume : **71,0 m³**
Receiving room volume : **67,6 m³**

Frequency ***f*** [Hz]	***R*** ⅓ octave [dB]
50	25,7
63	35,4
80	39,2
100	42,6
125	43,4
160	47,7
200	48,7
250	47,4
315	49,2
400	53,7
500	56,0
630	60,2
800	64,4
1000	67,2
1250	70,8
1600	71,8
2000	73,6
2500	74,9
3150	75,6
4000	74,3
5000	72,9
6300	72,1
8000	71,6
10000	69,82



Weighted sound reduction index, ***R*** w (***C***;***C*** tr), rating according to EN ISO 717-1:

$R_w(C;C_{tr})$ = 61 (-2 ; -6) dB ***C*** 50-3150 = **-3 dB** ***C*** 50-5000 = **-2 dB** ***C*** 100-5000 = **-1 dB**

Evaluation based on laboratory measurement results obtained by an engineering method ***C*** tr 50-3150 = **-13 dB** ***C*** tr 50-5000 = **-13 dB** ***C*** tr 100-5000 = **-6 dB**

"R&D Akustika" Ltd Acoustics laboratory T-282

Date : 2011.08.29.

Signature :

Testing report No 569/2011–AL8.4

Supplement 6

Sound reduction index, R , according to EN ISO 140-3
Laboratory measurements of airborne sound insulation of building elements

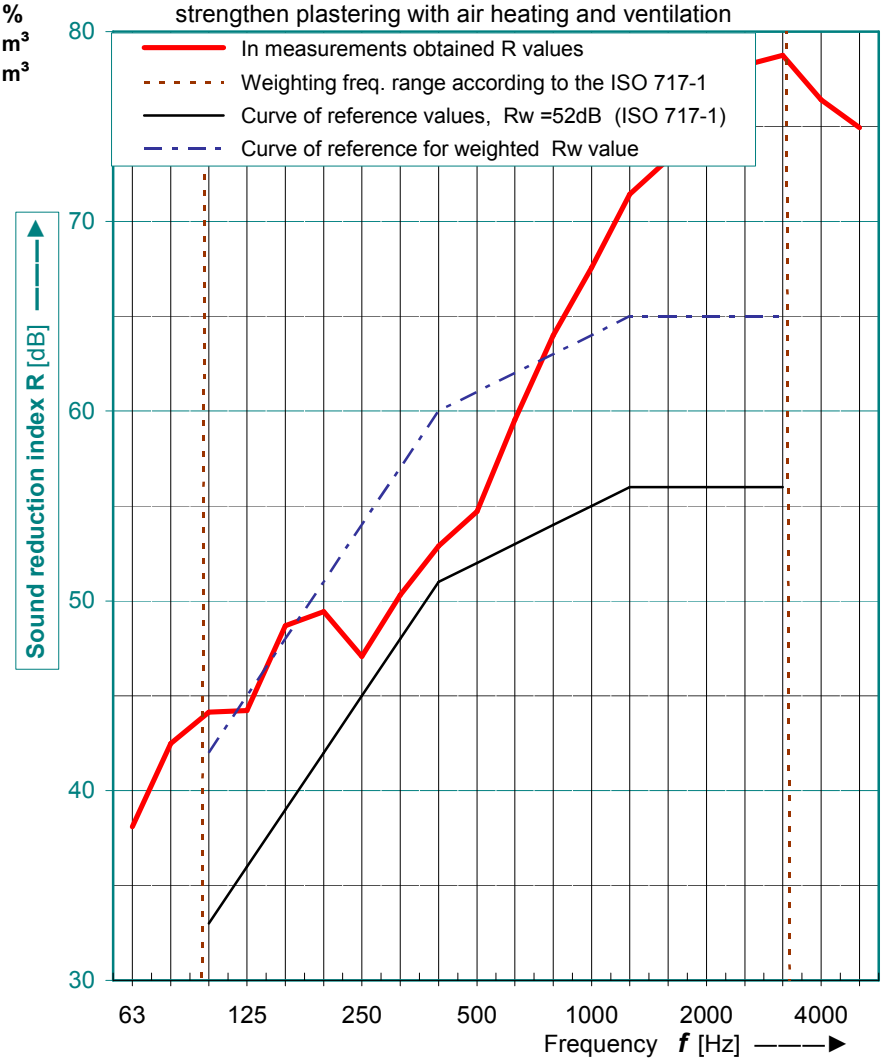
Manufacturer :	AEROC AS Estonia	**Sample identific. :**	No. 506-6
Client :	AEROC AS Estonia	**Test room identific. :**	Lab.T-282 Building acoust.chamber
Test specimen mounted by :	AEROC AS Estonia	**Date of test :**	August 26, 2011

Description of test specimen and arrangement: Double dividing wall — ***1) Inner plastering KNAUF MP-75 20mm, 2) AEROC Hard blocks 150mm, 3) ISOVER rock-wool OL-A 30mm, 4) Air intermediate layer 20mm, 5) AEROC Element 100mm 6) Inner plastering KNAUF MP-75 20mm***

Measurements were performed a 3 days after sample plastering and strengthen plastering with air heating and ventilation

Area ***S*** of test specimen :	**9,9 m²**
Mass per unit area :	**169 kg/m²**
Air temp. In the test rooms :	**19,0 °C**
Air humidity in the test rooms :	**83,0 %**
Source room volume :	**71,0 m³**
Receiving room volume :	**67,4 m³**

Frequency ***f*** [Hz]	***R*** ⅓ octave [dB]
50	23,8
63	38,1
80	42,5
100	44,1
125	44,2
160	48,7
200	49,4
250	47,1
315	50,3
400	52,9
500	54,7
630	59,5
800	64,0
1000	67,6
1250	71,4
1600	73,3
2000	75,7
2500	78,2
3150	78,8
4000	76,4
5000	74,9
6300	74,1
8000	72,0
10000	69,77



Weighted sound reduction index, ***R*** w (***C***;***C*** tr), rating according to EN ISO 717-1:

$R_w(C;C_{tr})$ = 61 (-2 ; -6) dB ***C*** 50-3150 = **-3 dB** ***C*** 50-5000 = **-2 dB** ***C*** 100-5000 = **-1 dB**

Evaluation based on laboratory measurement results obtained by an engineering method ***C*** tr 50-3150 = **-13 dB** ***C*** tr 50-5000 = **-13 dB** ***C*** tr 100-5000 = **-6 dB**

"R&D Akustika" Ltd Acoustics laboratory T-282

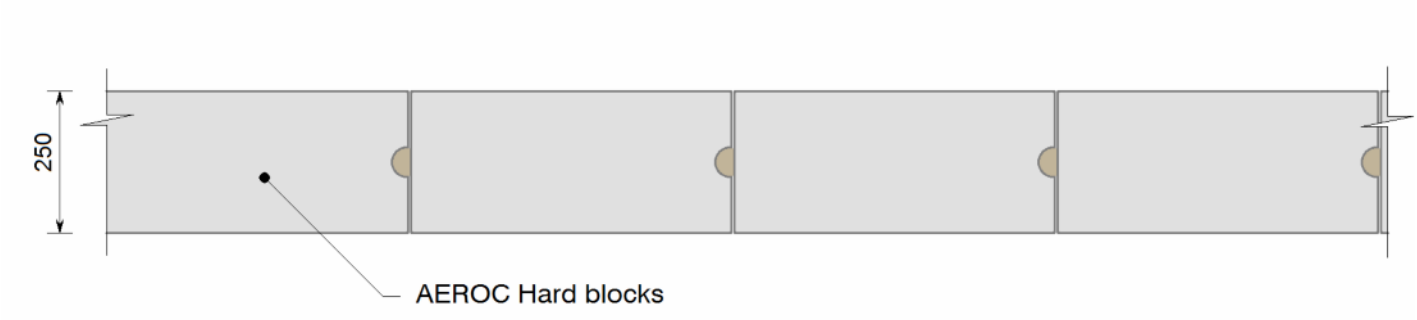
Date : 2011.08.29.

Signature :

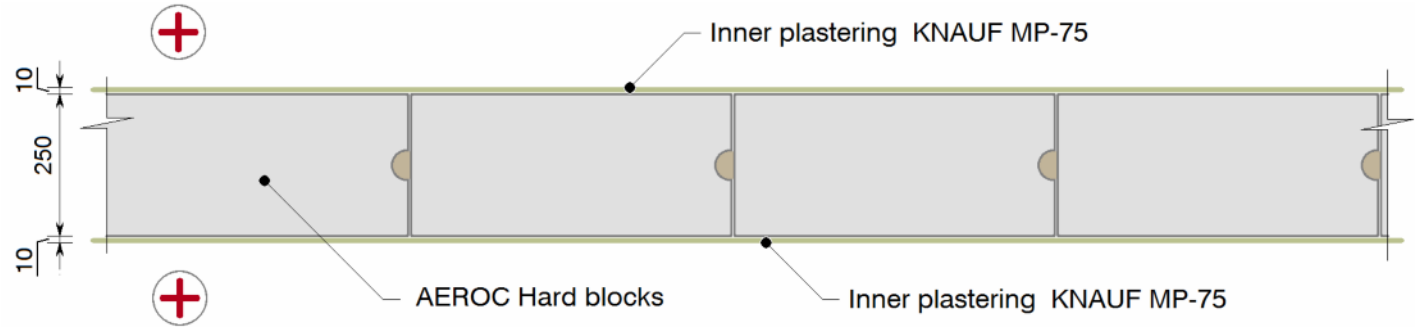
Supplement 7

Wall samples built in the Building acoustics Chamber's test opening

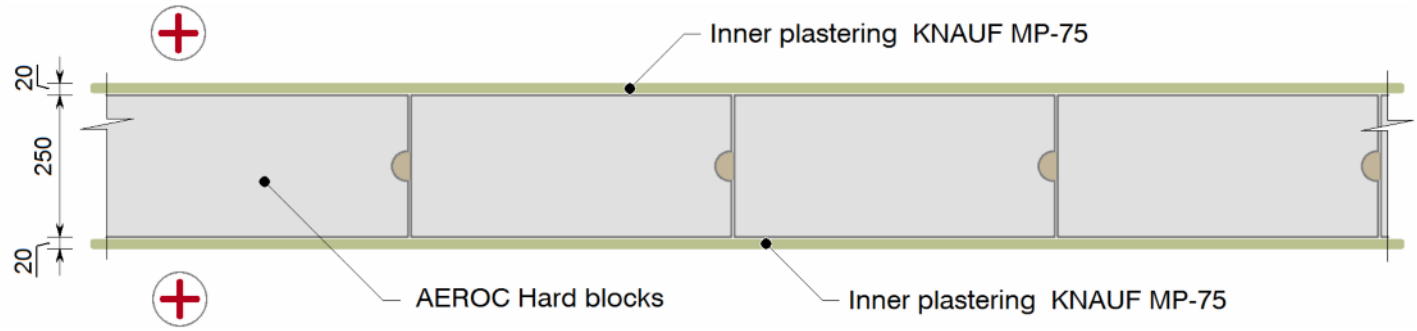
SAMPLE No 506-1 :



SAMPLE No 506-2 :

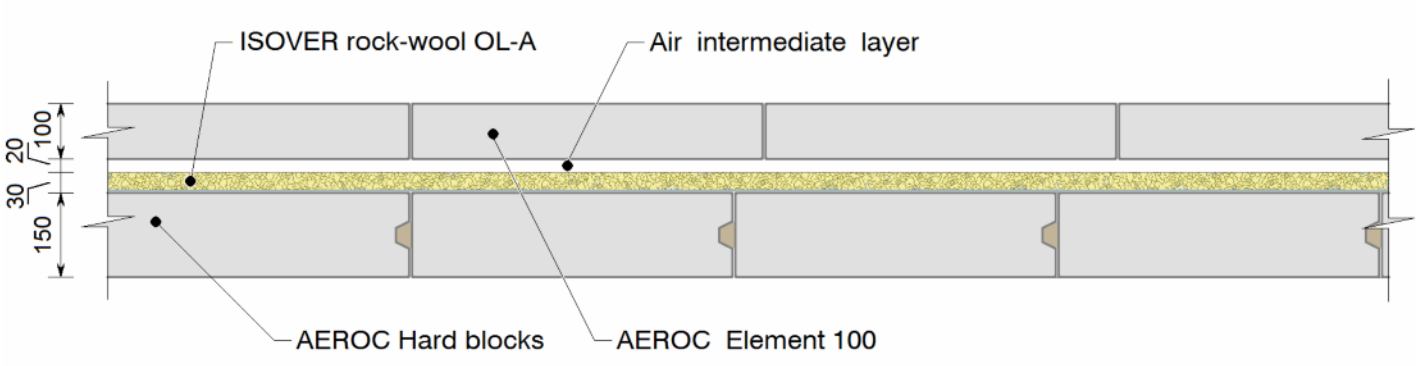


SAMPLE No 506-3 :

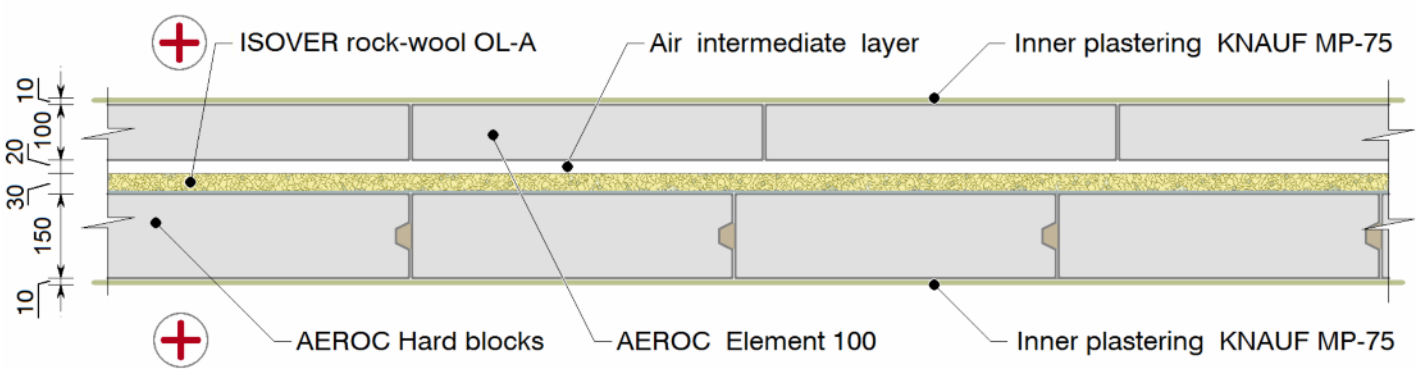


Continuation of Supplement 7

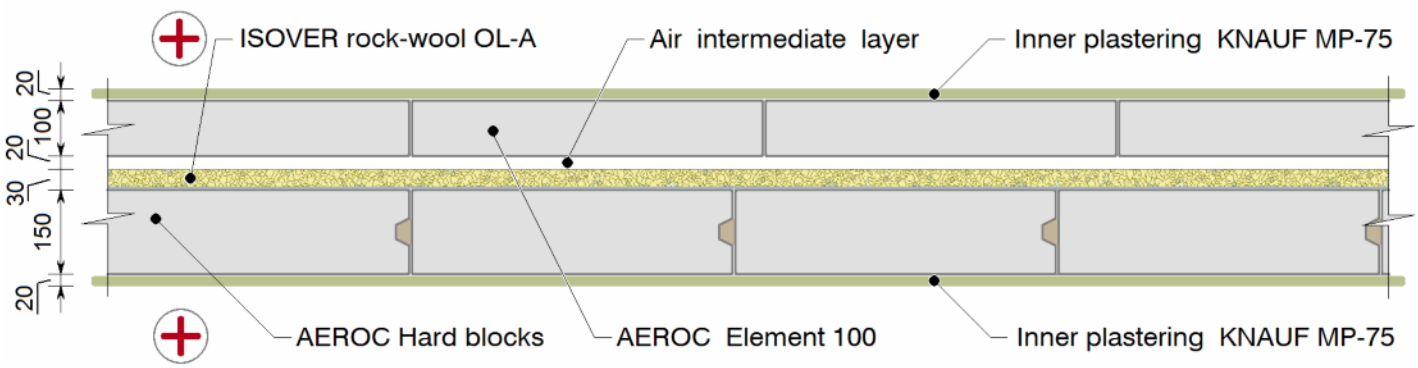
SAMPLE No 506-4



SAMPLE No 506-5 :



SAMPLE No 506-6 :



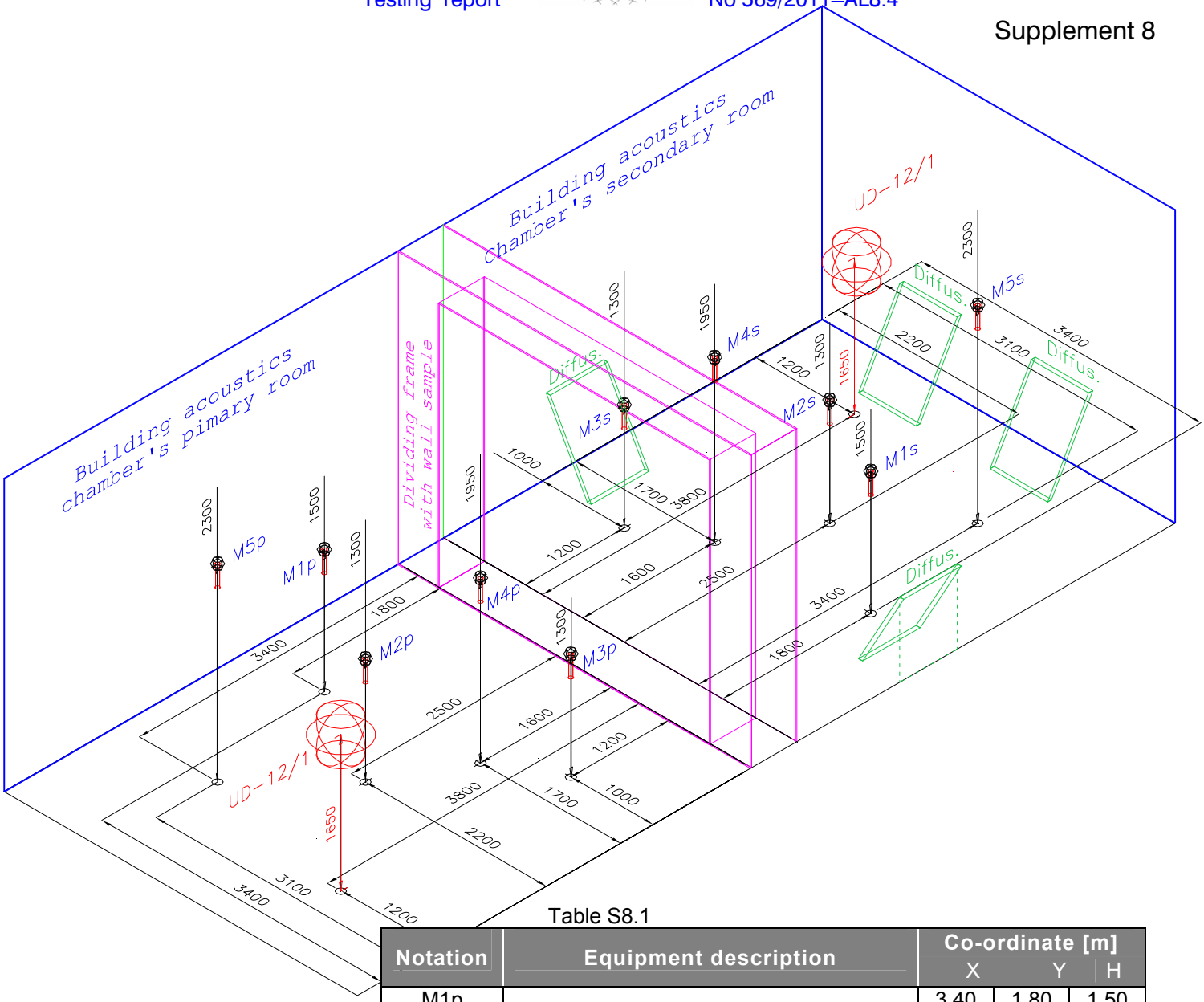


Table S8.1

Notation	Equipment description	Co-ordinate [m] X	Y	H
M1p	Microphone positions in Building acoustics chamber sound field primary room	3,40	1,80	1,50
M2p		2,20	2,50	1,30
M3p		1,00	1,20	1,30
M4p		1,70	1,60	1,95
M5p		3,10	3,40	2,30
M1s	Microphone positions in Building acoustics chamber sound field secondary room	3,40	1,80	1,50
M2s		2,20	2,50	1,30
M3s		1,00	1,20	1,30
M4s		1,70	1,60	1,95
M5s		3,10	3,40	2,30
UD-12\1	Speaker for reverb. time ***T***s measuring	1,20	3,60	1,65
	1.Omni-directional speaker (position A4)	1,00	2,40	1,85
	2.Omni-directional speaker (position A1)	2,30	3,80	1,45
	3.Omni-directional speaker (position A2)	1,50	3,70	1,65
Diffus.	Diffusers ≠ 0,019x0,7x1,0 (4 pieces)	~60° angle to floor		

Fig.S8.1. Measuring equipment disposition in Building acoustics chamber (co-ordinates on figure is given in [mm], but in Table in [m]). For UD-12\1 in primary room is shown only position 1 (position 2 co-ordinates are given in Table S8.1).