

**HEALTH AND COMFORT DEPARTMENT**

Acoustics Test Laboratory

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## TEST REPORT N° AC14-26050228 CONCERNING TWO PARTITION WALLS

The accreditation by the COFRAC Laboratory Section attests to the technical competence of the laboratories only for the tests covered by the accreditation.

This test report certifies only the characteristics of the object submitted for testing and does not prejudice the characteristics of similar products. So it does not constitute a product certification in the sense of Article L 115-27 to L 115-32 and R115-1 to R115-3 of the Consumer Code modified by the law n° 2008-776 of the 4th of August, 2008 article 113.

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It comprises twelve pages.

**REQUESTED BY:**

**PLACOPLATRE**  
34 avenue Franklin Roosevelt  
92282 SURESNES CEDEX  
FRANCE

N/Réf. : BR-70042938  
26050228  
EB/VG

## TEST SCOPE

Determination of the airborne sound reduction index R of two partition walls.

## REFERENCE TEXTS

The measurements were carried out according to standards NF EN ISO 10140-1 (2013), NF EN ISO 10140-2 (2013), NF EN ISO 10140-4 (2013), NF EN ISO 10140-5 (2013) and NF EN 20140-2 (1993) supplemented by the standard NF EN ISO 717/1 (2013).

## TEST SPECIMEN

Date of reception in the laboratory : 26/03/2014  
Origin : Requester  
Installation : Requester

## SUMMARY LIST OF TESTS

Test N°	Object submitted for testing
1	Partition wall 72/48 with an Aquaroc™ 13, Stil ML48/50 studs with PAR 45
2	Partition wall 98/48 with an Aquaroc™ 13, Stil ML48/50 studs with PAR 45

Prepared at Marne-la-Vallée, June 3, 2014

Responsible for the test

Emeline BRAHIMI

Head of division



Jean-Baptiste CHÉNÉ

**DESCRIPTION AND INSTALLATION  
OF A PARTITION WALL**

Test 1  
Date 28/03/14  
Station EPSILON

<b>REQUESTER</b>	<b>PLACOPLATRE</b>
<b>MANUFACTURER</b>	<b>PLACOPLATRE (framework and cement boards)</b> <b>SAINT GOBAIN ISOVER (glass wool)</b>
<b>NAME</b>	<b>Partition wall 72/48</b>
<b>CONFIGURATION</b>	<b>With an Aquaroc™ 13, STIL ML48/50 studs with PAR 45</b>

**MAIN CHARACTERISTICS**

Dimensions in mm : 4180 x 2470  
 Thickness in mm : 73.0  
 Mass per unit area in kg/m<sup>2</sup>: 26.8 (without framework)

**DESCRIPTION (dimensions are given in mm)**

Framework	Galvanised steel section. Channel: ref. STIL R48/300 (PLACOPLATRE). Studs: ref. ML 48-50 / 399 (PLACOPLATRE). Intermediate channel: ref. Stil R48/300 (PLACOPLATRE).
Boards	One layer of cement board ref. Aquaroc™ 13 (PLACOPLATRE) of dimensions 1200 x 3000 x 12.5 and mass per unit area 13.1 kg/m <sup>2</sup> .
Core	Glass wool ref. PAR DUO (SAINT GOBAIN ISOVER), of dimensions 600 x 15600 x 45 and mass per volume unit 12.9 kg/m <sup>3</sup> .
Finishing	Coating ref. Aquaroc™ Promix Finish (PLACOPLATRE) + strips ref. Fibratape (PLACOPLATRE), 48 in width. Sealant ref. SILYGUTT® BATIMENT (SYKA®).

**INSTALLATION (dimensions are given in mm)**

The perimeter framework is fixed to the frame at 500 mm centres.

The studs are engaged in head and floor channels at 600 mm centres. They maintain the core panels by compression. An intermediate cross at 1000 high is maintained by compression of studs.

The cement boards, juttred out from a face to another, are screwed on the framework at 300 mm centres and on intermediate cross.

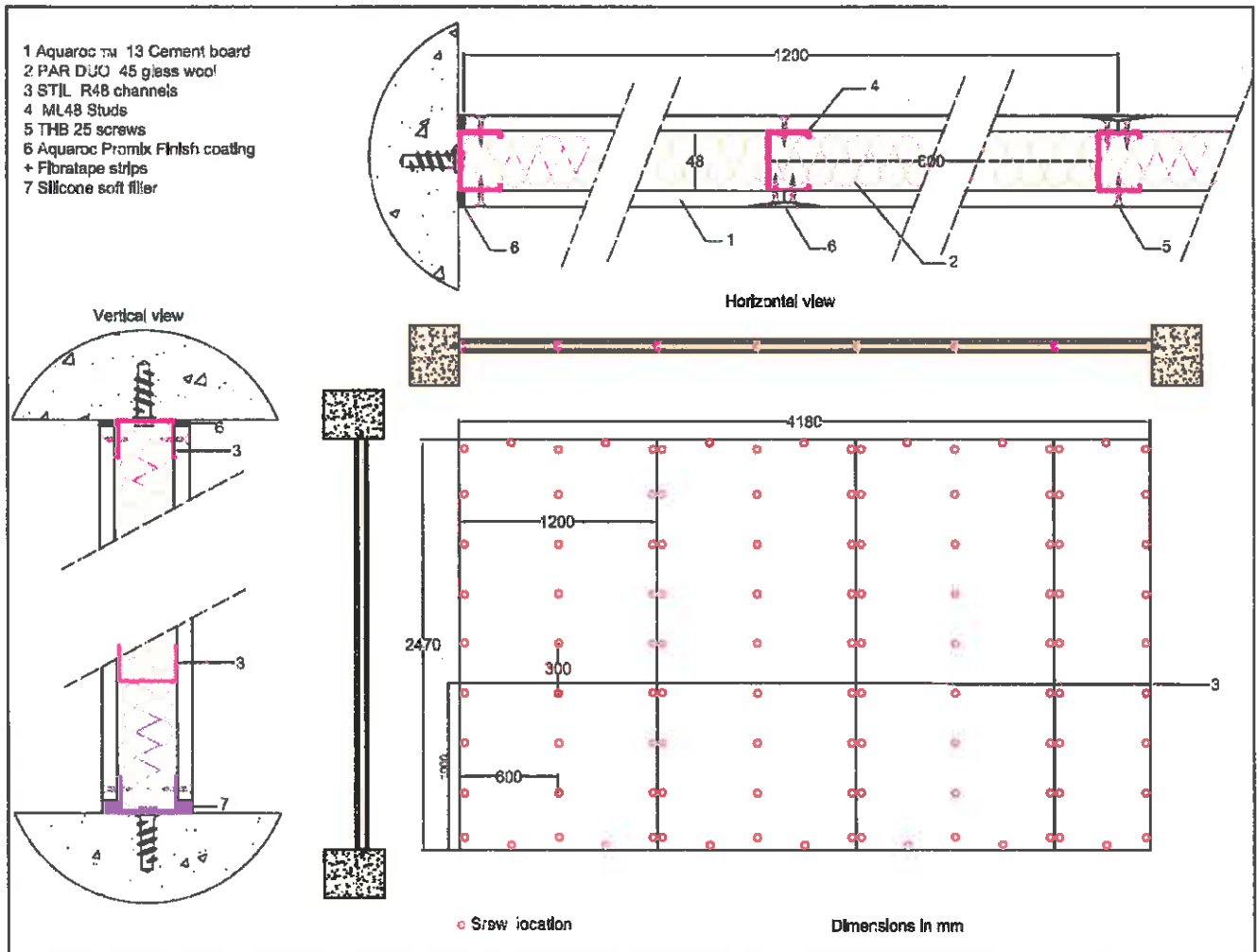
The joints treatment between panels and cement board edges (5 thick in the upper part and laterally) is carried out by a fast drying coat and joint tape system.

In the lower part, the 10 thick joint is filled by soft filler.

**DRAWINGS  
OF A PARTITION WALL**

Test 1  
Date 28/03/14  
Station EPSILON

<b>REQUESTER</b>	<b>PLACOPLATRE</b>
<b>MANUFACTURER</b>	<b>PLACOPLATRE (framework and cement boards)</b>
	<b>SAINT GOBAIN ISOVER (glass wool)</b>
<b>NAME</b>	<b>Partition wall 72/48</b>
<b>CONFIGURATION</b>	<b>With an Aquaroc™ 13, STIL ML48/50 studs with PAR 45</b>



**PICTURE  
OF A PARTITION WALL**

Test 1  
Date 28/03/14  
Station EPSILON

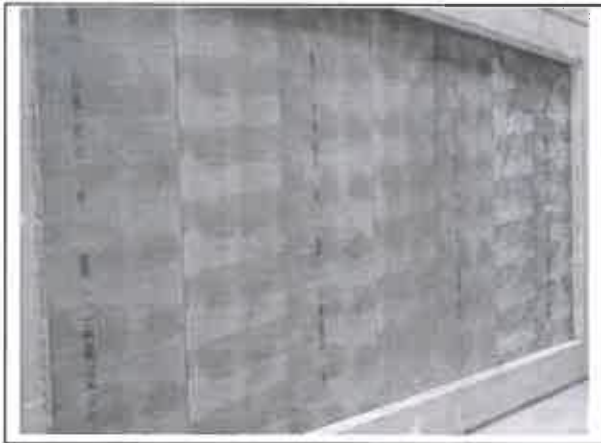
<b>REQUESTER</b>	<b>PLACOPLATRE</b>
<b>MANUFACTURER</b>	<b>PLACOPLATRE (framework and cement boards) SAINT GOBAIN ISOVER (glass wool)</b>
<b>NAME</b>	<b>Partition wall 72/48</b>
<b>CONFIGURATION</b>	<b>With an Aquaroc™ 13, STIL ML48/50 studs with PAR 45</b>



Framework



Framework with glass wool



Cement board on one side



Lower part, joint with soft filler

**SOUND REDUCTION INDEX R  
OF A PARTITION WALL**

Test 1  
Date 28/03/14  
Station EPSILON

AD12

**REQUESTER** PLACOPLATRE  
**MANUFACTURER** PLACOPLATRE (framework and cement boards)  
SAINT GOBAIN ISOVER (glass wool)  
**NAME** Partition wall 72/48  
**CONFIGURATION** With an Aquaroc™ 13, STIL ML48/50 studs with PAR 45

**MAIN CHARACTERISTICS**

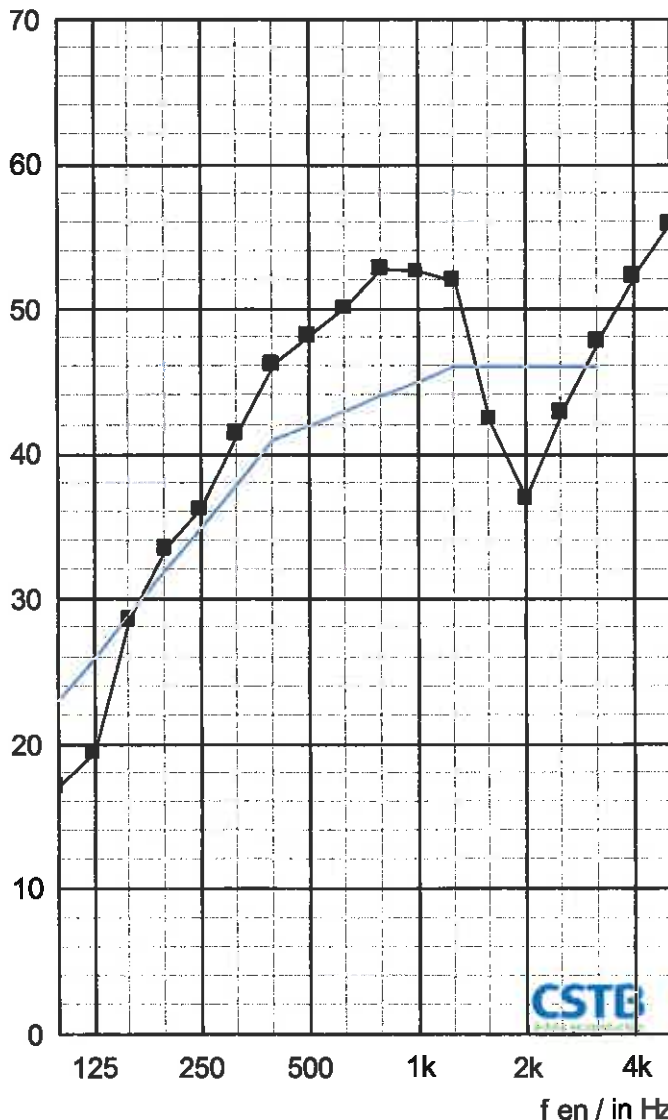
Dimensions in mm : 4180 x 2470  
Thickness in mm : 73.0  
Mass per unit area in kg/m²: 26.8 (without frame)

**MEASUREMENT CONDITIONS**

**Source room:** Receiving room:  
Temperature: 20.5°C Temperature: 20.5°C  
Relative humidity: 18 % Relative humidity: 30 %

**RESULTS**

■ R en / in dB — Courbe de référence / Reference curve



f	R
100	17,1
125	19,4
160	28,6
200	33,5
250	36,2
315	41,4
400	46,2
500	48,2
630	50,1
800	52,8
1000	52,6
1250	52,0
1600	42,4
2000	36,9
2500	42,9
3150	47,8
4000	52,3
5000	55,8
Hz	dB

(\*) : valeur corrigée/corrected value. (+) : limite de poste/station limit.

$R_w (C; C_{tr}) = 42(-3; -8) \text{ dB}$

Pour information / For information:

$R_v = R_w + C = 39 \text{ dB}$

$R_{wv} = R_v + C_v = 34 \text{ dB}$

**DESCRIPTION AND INSTALLATION  
OF A PARTITION WALL**

**Test 2**  
**Date 22/04/14**  
**Station EPSILON**

**REQUESTER** PLACOPLATRE  
**MANUFACTURER** PLACOPLATRE (framework and cement boards)  
SAINT GOBAIN ISOVER (glass wool)  
**NAME** Partition wall 98/48  
**CONFIGURATION** With an Aquaroc™ 13, STIL ML48/50 studs with PAR 45

**MAIN CHARACTERISTICS**

Dimensions in mm : 4180 x 2470  
Thickness in mm : 98.0  
Mass per unit area in kg/m<sup>2</sup>: 54.0 (without framework)

**DESCRIPTION** (dimensions are given in mm)

Framework	Galvanised steel section. Channel: ref. STIL R48/300 (PLACOPLATRE). Studs: ref. ML 48-50 / 399 (PLACOPLATRE).
Boards	Two layers of cement board ref. Aquaroc™ 13 (PLACOPLATRE) of dimensions 1200 x 2500 x 12.5 and mass per unit area 13.4 kg/m <sup>2</sup> .
Core	Glass wool ref. PAR 45 (SAINT GOBAIN ISOVER), of dimensions 600 x 15600 x 45 and mass per volume unit 12.3 kg/m <sup>3</sup> .
Finishing	Coating ref. Aquaroc™ Promix Finish (PLACOPLATRE) + strips ref. Fibratape (PLACOPLATRE), 48 in width. Sealant ref. SILYGUTT® BATIMENT (SYKA®).

**INSTALLATION** (dimensions are given in mm)

The perimeter framework is fixed to the frame at 500 mm centres.

The studs are engaged in head and floor channels at 600 mm centres. They maintain the core panels by compression.

The boards are composed of two layers, the first one is screwed on the studs at 600 mm centres and the second one at 300 mm centres.

The boards are jugged out from the other face boards and between two cement boards.

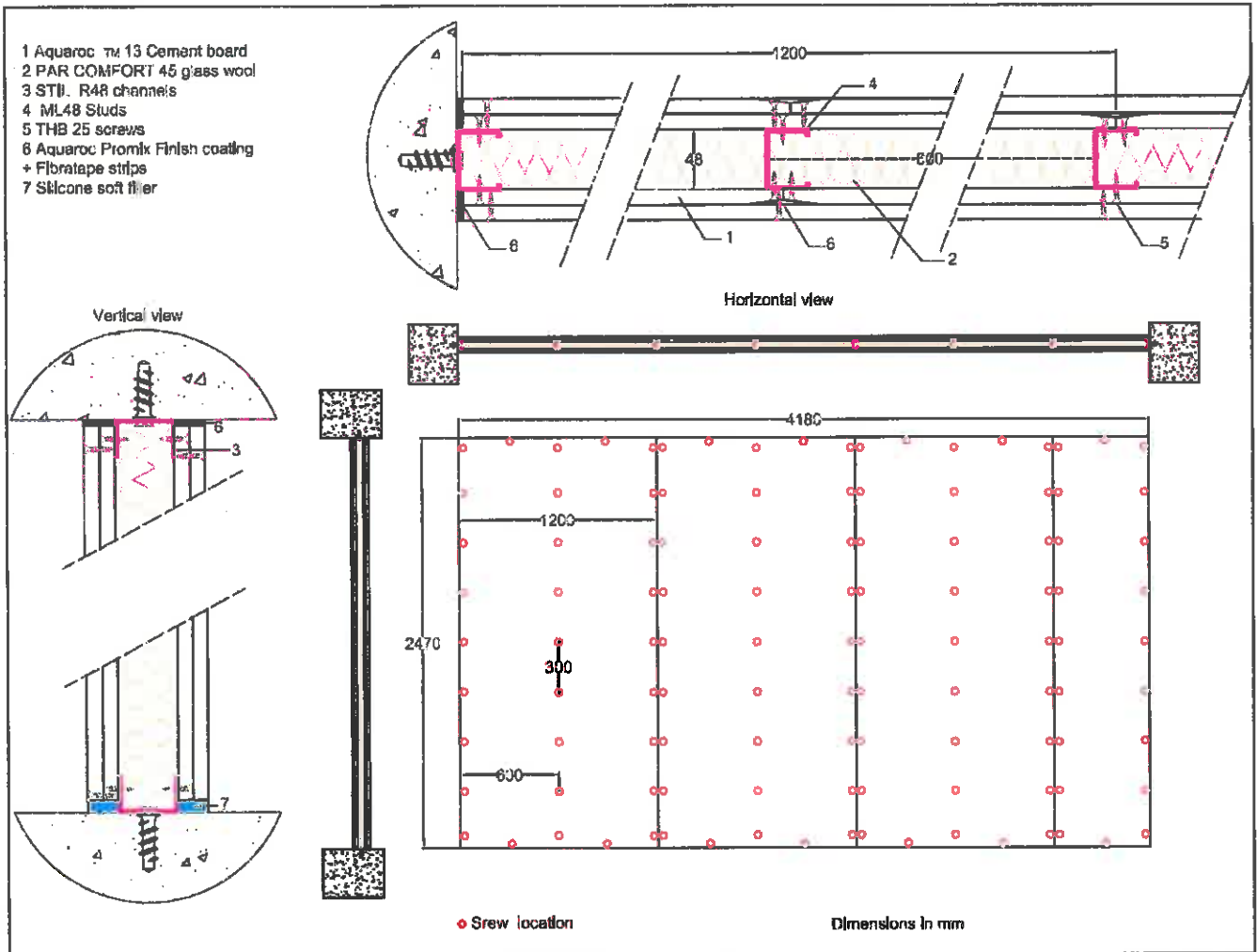
The joints treatment between panels and cement board edges (5 thick in the upper part and laterally) is carried out by a fast drying coat and joint tape system.

In the lower part, the 10 thick joint is filled by soft filler.

**DRAWINGS  
OF A PARTITION WALL**

Test **2**  
Date **22/04/14**  
Station **EPSILON**

**REQUESTER** PLACOPLATRE  
**MANUFACTURER** PLACOPLATRE (framework and cement boards)  
**SAINT GOBAIN ISOVER** (glass wool)  
**NAME** Partition wall 98/48  
**CONFIGURATION** With an Aquaroc™ 13, STIL ML48/50 studs with PAR 45



**SOUND REDUCTION INDEX R  
OF A PARTITION WALL**

Test 2  
Date 22/04/14  
Station EPSILON

AD12

**REQUESTER** PLACOPLATRE  
**MANUFACTURER** PLACOPLATRE (framework and cement boards)  
SAINT GOBAIN ISOVER (glass wool)  
**NAME** Partition wall 98/48  
**CONFIGURATION** With an Aquaroc™ 13, STIL ML48/50 studs with PAR 45

**MAIN CHARACTERISTICS**

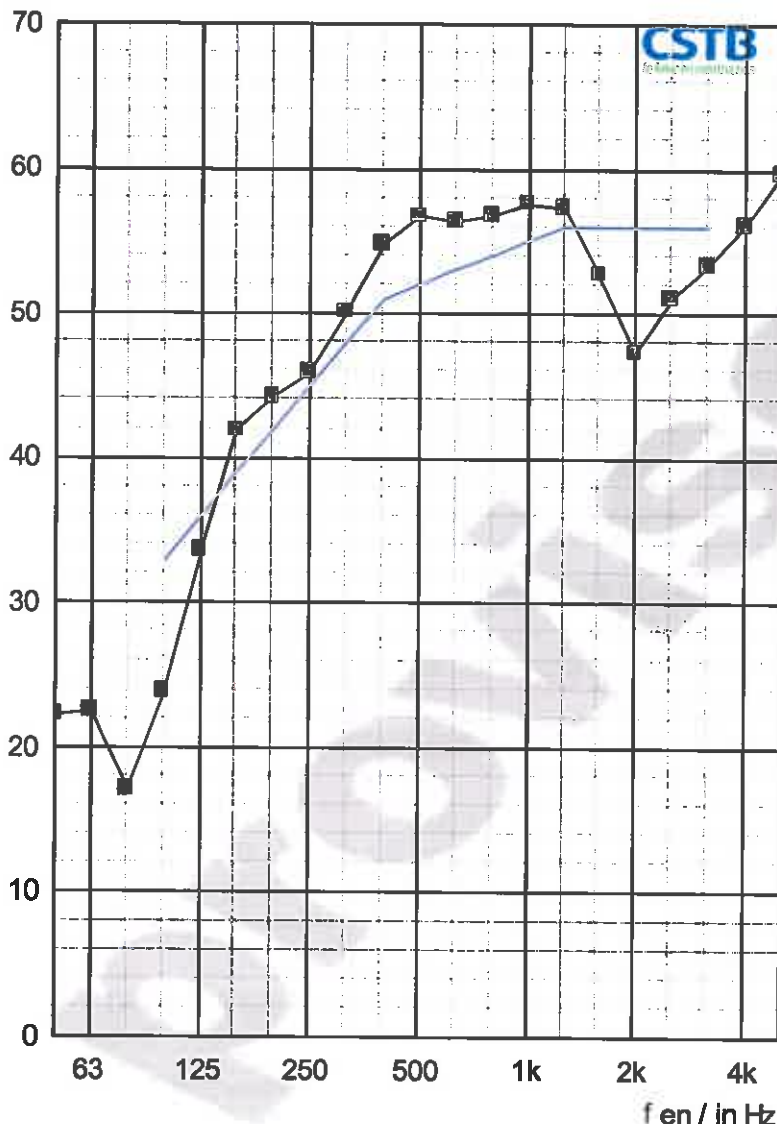
Dimensions in mm : 4180 x 2470  
Thickness in mm : 98.0  
Mass per unit area in kg/m²: 54.0 (without frame)

**MEASUREMENT CONDITIONS**

**Source room:** Temperature: 17.5°C  
Relative humidity: 45 %  
**Receiving room:** Temperature: 18.5°C  
Relative humidity: 54 %

**RESULTS**

■ R en / in dB      — Courbe de référence / Reference curve



f	R
50	22,2
63	22,5
80	17,1
100	23,8
125	33,6
160	41,9
200	44,2
250	45,9
315	50,1
400	54,8
500	56,7
630	56,4
800	56,8
1000	57,6
1250	57,3
1600	52,7
2000	47,3
2500	51,1
3150	53,3
4000	56,1
5000	59,7
Hz	dB

(\*) : valeur corrigée/corrected value. (-): limite de poste/station limit.

$R_w (C; C_{tr}) = 52(-3; -9) \text{ dB}$

Pour information / For information:

$R_v = R_w + C = 49 \text{ dB}$

$R_{v,r} = R_w + C_r = 43 \text{ dB}$

## APPENDIX 1 ANALYSIS PROCEDURE AND EXPRESSION OF THE RESULTS

### SOUND REDUCTION INDEX R

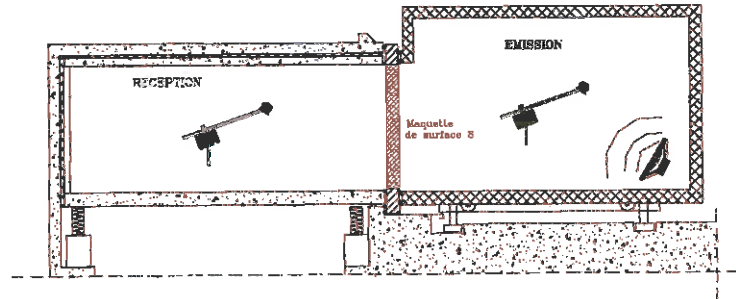
➤ **Method of evaluation: NF EN ISO 10140-2 (2013)**

The standard NF EN ISO 10140-2 (2013) is the method of evaluation of the airborne sound insulation of the building elements like walls, floors, doors, windows, facade element, facades, ...

The measurement must be run into a test laboratory without any flanking transmissions. The test facility is composed of two rooms: one fixed room where we put onto the concrete frame with the sample to be tested and a moving box, creating a couple "emission room – reception room ». Those rooms and the concrete frame are separated (neoprene seals) and are in accordance to the standard NF EN ISO 10140-5 (2013). The conception of rooms (box in the box) gets a strong soundproofing towards the outside and allows to measure very weak levels of background noise.

Measurement by 1/3 of octave, from 100 to 5000 Hz:

- Of the background noise level in the reception room  $L_{Bdf}$
- Of the insulation:  $L_E - L_R$
- Of the reverberation time of the reception room T



Calculation of the airborne sound insulation R in dB for any 1/3 of octave:

$$R = L_E - L_R + 10 \log (S/A)$$

$L_E$ : Sound level in the emission room in dB

$L_R$ : Sound level in the reception room, corrected with the background sound in dB

S: surface of the sample to be tested in  $m^2$

A: Equivalent absorption area in the reception room in  $m^2$

$A = (0.16 \times V)/T$  with V the volume of the reception room in  $m^3$   
and T the reverberation time of this room in s.

The more R is high, the more insulating the element is.

➤ **Expression of the results: Calculation of the overall weighted index  $R_w(C;C_{tr})$  according to the standard NF EN ISO 717-1 (2013)**

Consideration of the values of R by third (third party) of octave between 100 and 3150 Hz with a precision in the 1/10th of dB.

Vertical movement of a reference curve by jump of 1 dB until the sum of the unfavourable distances is the biggest while remaining lower or equal to 32.0 dB.

$R_w$  dB is the value given then by the curve of reference to 500 Hz.

The terms of adaptation to a spectre (C and  $C_{tr}$ ) are calculated by means of reference spectres to obtain:

$R_{A,tr} = R_w + C_{tr}$  dB The terms of adaptation to a spectrum (C and  $C_{tr}$ ) are calculated with reference spectrum to obtain:

- The insulation towards noises of airport or industrial neighbourhood, activities:  
 **$R_A = R_w + C$  en dB**
- The isolation towards the noise of infrastructure of ground transport:  **$R_{A,tr} = R_w + C_{tr}$  en dB**

**APPENDIX 2 – EQUIPMENT**

**EPSILON STATION**

Salle d'émission / *Emission room* : EPSILON 3

DÉSIGNATION	MARQUE	TYPE	N° CSTB
Chaîne microphonique <i>Microphone network</i>	Bruël & Kjær	Microphone 4166	
	Bruël & Kjær	Préamplificateur / <i>Pre-amplifier</i> 2669	CSTB 01 0210
Bras tournant <i>Rotating arm</i>	Bruël & Kjær	3923	CSTB 97 0162
Amplificateur <i>Amplifier</i>	LAB GRUPPEN	LAB1000	CSTB 97 0195
Source <i>Speaker</i>	CSTB-PHL AUDIO	Cube	CSTB 12 419
Source <i>Speaker</i>	CSTB-PHL AUDIO	Cube	CSTB 12 0422

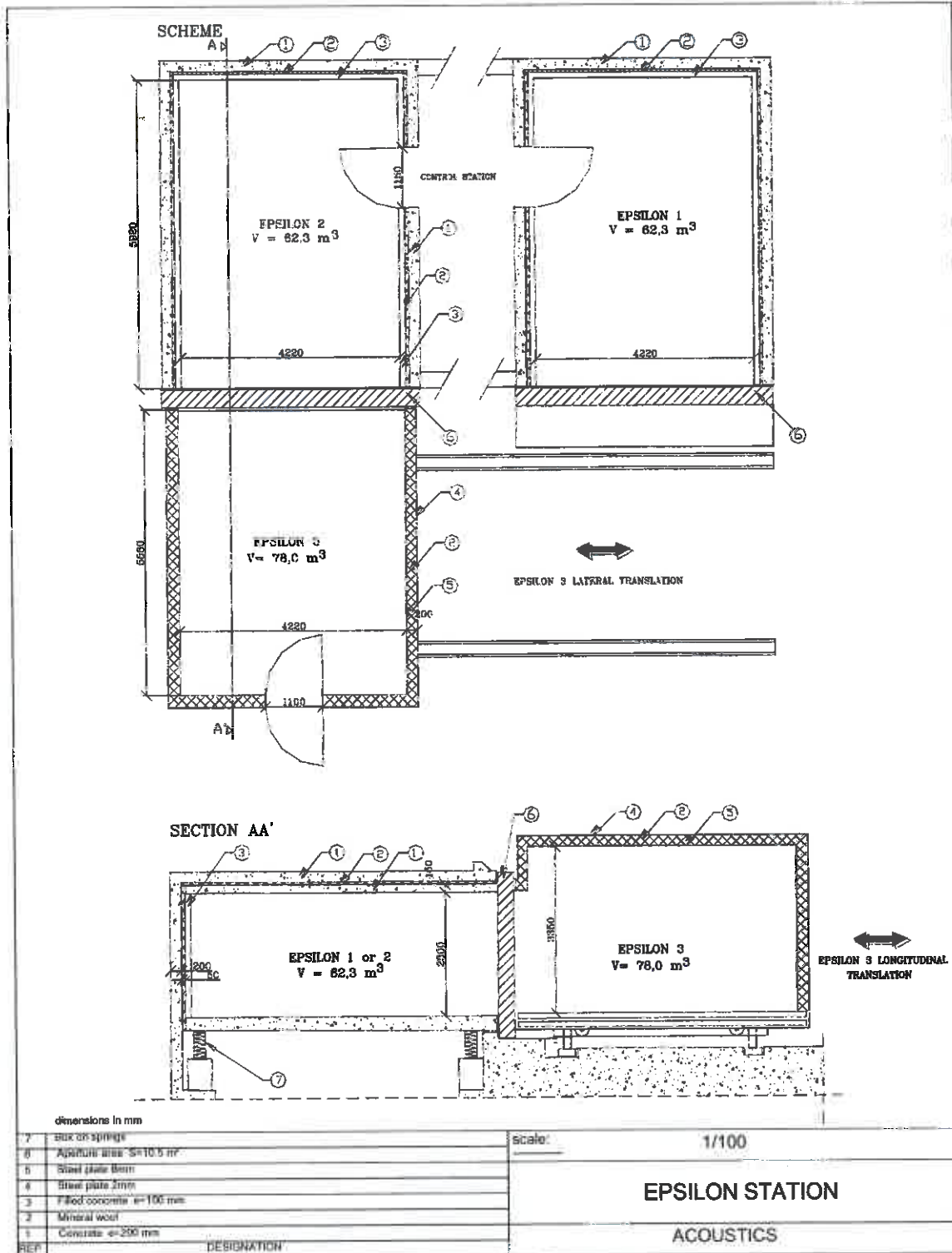
Salle de réception / *Reception room* : EPSILON 2

DÉSIGNATION	MARQUE	TYPE	N° CSTB
Chaîne microphonique <i>Microphone network</i>	Bruël & Kjær	Microphone 4166	
	Bruël & Kjær	Préamplificateur / <i>Pre-amplifier</i> 2669	CSTB 01 0213
Bras tournant <i>Rotating arm</i>	Bruël & Kjær	3923	CSTB 80 007
Amplificateur <i>Amplifier</i>	CARVER	PM600	CSTB 91 0120
Source <i>Speaker</i>	CSTB-ELECTRO VOICE	Pyramide	CSTB 97 0199

Salle de commande / *Control room*

DÉSIGNATION	MARQUE	TYPE	N° CSTB
Analyseur temps réel <i>Real Time Analyser</i>	Bruël & Kjær	2144	CSTB 95 0146
Micro-ordinateur <i>Microcomputer</i>	DELL	OPTIPLEX GX 270	
Calibreur <i>Calibrator</i>	Bruël & Kjær	4231	CSTB 04 1839

**APPENDIX 3 – DRAWINGS OF THE TEST STATION EPSILON STATION**



**END OF REPORT**