


## TEST REPORT N° AC03-006/2 CONCERNING A CONCRETE FLOOR

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

Scope of accreditation available on request.

This Test Report certifies only the characteristics of the object submitted for testing and does not prejudge the characteristics of similar products. So it does not constitute a product certification in the sense of Article L 115-27 of the Consumer Code and of the Law of June 3, 1994.

Only the tests identified by the symbol  are made under the cover of the accreditation

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It comprises eleven pages.

**REQUESTED BY:           KdB ISOLATION**  
**2, avenue Lotz-Cossé**  
**Boîte Postale 47506**  
**44275 NANTES Cédex**

Our/Ref.: BR-1113887  
ES713-02-0290  
CC/EG

**SCOPE**

Determine the airborne sound insulation R of a concrete floor and the improvement of the impact sound insulation  $\Delta L$  of a floating screed.

**REFERENCE TEXTS**

The measurements are carried out:

- for the airborne sound insulation R, according to the standards NF EN ISO 140-1, NF EN 20140-2 and NF EN ISO 140-3 supplemented by the standard NF EN ISO 717/1 and by the appendix of the standard NF S 31-057 concerning the calculation of the overall indexes,
- for the improvement of the impact sound insulation  $\Delta L$ , according to the standards NF EN ISO 140-1, NF EN 20140-2, NF EN ISO 140-6 and NF EN ISO 140-8 supplemented by the standard NF EN ISO 717/2 and by the appendix of the standard NF S 31-057 concerning the calculation of the overall indexes.

The measurements run for the calculation of the dynamic stiffness of the underlay are carried out :

- under a load of 8 kg , according to the standard NF EN 29052-1 "Determination of the dynamic stiffness",
- under a load of 4 kg, according to the internal notice 01-0605 supplemented by the standard NE EN 29052-1.

**SAMPLES SUBMITTED TO THE TESTS**

Date of reception in the laboratory : 04/02/03  
Origin : KdB Isolation  
Installation : CSTB

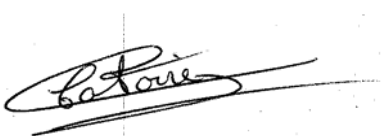
**SUMMARY LIST OF TESTS**

TEST N0	Tested samples	Type of test
5	Concrete floor with floating screed	R
6	Concrete floor	R
7	Floating floor	$\Delta L$
8	Concrete floor	Ln

Made at Marne La Vallée, April 8th 2003

Responsible for the tests

The Head of the Acoustic and Lighting department



Corinne CATOIRE



Jacques ROLAND

Corinne CATOIRE

Jacques ROLAND

# AIRBORNE SOUND INSULATION R OF A CONCRETE FLOOR WITH & WITHOUT A FLOATING FLOOR

Tests **5 & 6**  
Date **06 & 18/03/03**  
Station **DELTA**

AD13

**REQUESTER**

**KdB Isolation**

**MANUFACTURER**

**FOATING SCREED**

**UNDERLAY**

**NAME**

CSTB

KdB Isolation

**CHARACTERISTICS**

AIRFLEX

Nature

No armed cement mortar  
concrete floor

Fireproofed polyethylene foam and  
films with air bubbles

Thickness in mm

40

10

Mass per unit of area in kg/m<sup>2</sup>

90

0,615

Dynamic stiffness in MN/m<sup>3</sup>

13 under load of de 8 kg

10 under load of 4 kg

Installation

Flowed

Laid

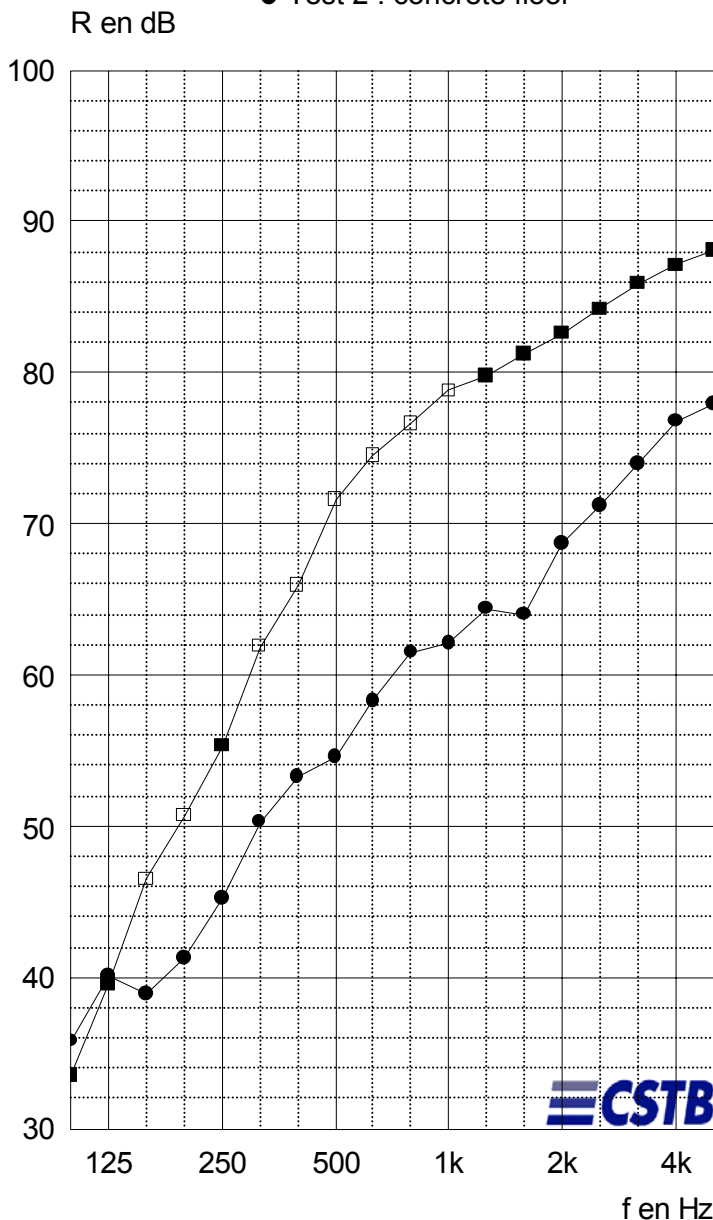
**CONCRETE FLOOR**

Floor with edge in reinforced concrete thickness 140 mm

**RÉSULTS**

■ Test 1 : concrete floor + underlay + foating screed

● Test 2 : concrete floor



Code	■	●
f	R	R
100	33,5	35,8
125	39,6	40,1
160	46,5 <sup>(60,9)</sup>	38,9
200	50,7 <sup>(64,7)</sup>	41,3
250	55,3	45,2
315	61,9 <sup>(74,5)</sup>	50,3
400	65,9 <sup>(77,5)</sup>	53,3
500	71,6 <sup>(82,5)</sup>	54,6
630	74,5 <sup>(85,4)</sup>	58,3
800	76,6 <sup>(88,2)</sup>	61,5
1k	78,8 <sup>(92,3)</sup>	62,1
1,25k	79,8	64,4
1,6k	81,2	64,0
2k	82,6	68,7
2,5k	84,2	71,2
3,15k	85,9	74,0
4k	87,1	76,8
5k	88,1	77,9
Hz	dB	dB

(\*) : valeur corrigée. (+) : limite de poste.

■	<b><math>R_w(C;C_{tr}) \geq 64(-4;-12)</math> dB</b> Pour information : $R_{max} \geq 61$ dB(A) <span style="float: right;"><math>R_{min} = 54</math> dB(A)</span>
●	<b><math>R_w(C;C_{tr}) = 57(-2;-7)</math> dB</b> Pour information : $R_{max} = 56$ dB(A) <span style="float: right;"><math>R_{min} = 50</math> dB(A)</span>

**AIRBORNE SOUND INSULATION R  
OF A CONCRETE FLOOR WITH & WITHOUT A FLOATING FLOOR**

Tests **5 & 6**  
Date **06 & 18/03/03**  
Station **DELTA**

REQUESTER	KdB Isolation	
	<b>FOATING SCREED</b>	<b>UNDERLAY</b>
<b>MANUFACTURER</b>	CSTB	KdB Isolation
<b>NAME</b>		AIRFLEX
<b>CHARACTERISTICS</b>		
Nature	No armed cement mortar concrete floor	Fireproofed polyethylene foam and films with air bubbles
Thickness in mm	40	10
Mass per unit of area in kg/m <sup>2</sup>	90	0,615
Dynamic stiffness in MN/m <sup>3</sup>		13 under load of de 8 kg 10 under load of 4 kg
Installation	Flowed	Laid

**CONCRETE FLOOR** Floor with edge in reinforced concrete thickness 140 mm

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

- \* Concrete floor:
  - Nature: Floor with edge in reinforced concrete
  - Mass per unit of area in kg/m<sup>2</sup>: 325
  - Thickness: 140
- \* Underlay:
  - Reference: AIRFLEX
  - Nature: fireproofed polyethylene foam thickness 3 hot welded between two fireproofed polyethylene films with air bubbles thickness 150 μm, themselves covered by an aluminium film thickness 30 μm
  - Mass per unit of area in kg/m<sup>2</sup>: 0,625
  - Total thickness: 10
  - Presentation: Rollers of width 1200
  - Dynamic stiffness:
    - s' = 13 MN/m<sup>3</sup> under a load of 8 kg
    - s' = 10 MN/m<sup>3</sup> under a load of 4 kg
- \* Floating screed:
  - Nature : no armed cement mortar
  - Mass per unit of area in Kg/m<sup>2</sup>: 90
  - Thickness: 40

## AIRBORNE SOUND INSULATION R OF A CONCRETE FLOOR WITH & WITHOUT A FLOATING FLOOR

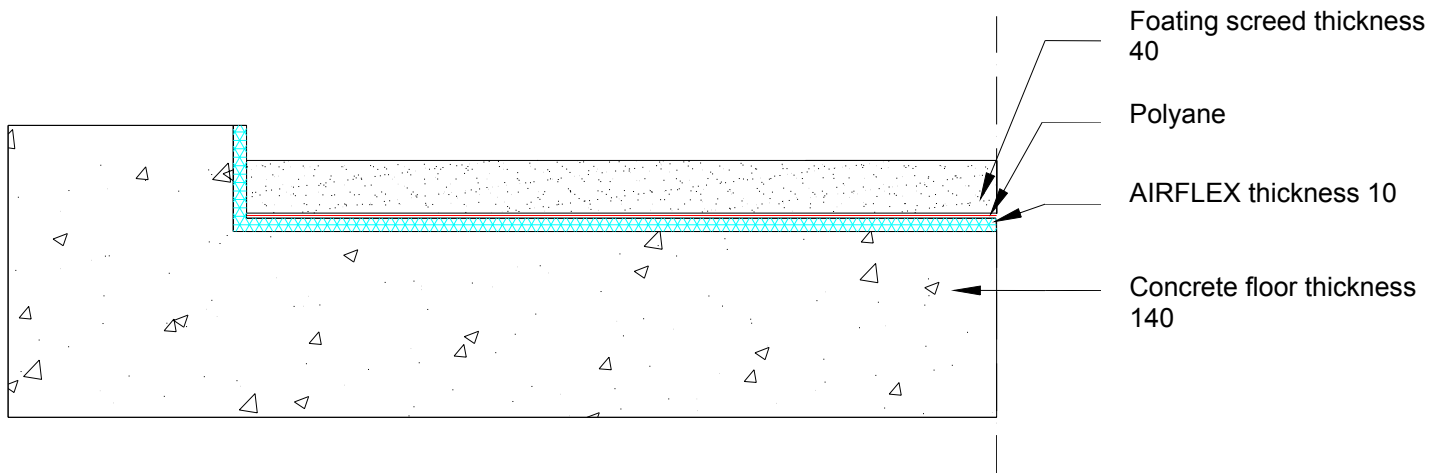
Tests 5 & 6  
 Date 06 & 18/03/03  
 Station DELTA

REQUESTER	KdB Isolation	
	<b>FOATING SCREED</b>	<b>UNDERLAY</b>
<b>MANUFACTURER</b>	CSTB	KdB Isolation
<b>NAME</b>		AIRFLEX
<b>CHARACTERISTICS</b>		
Nature	No armed cement mortar concrete floor	Fireproofed polyethylene foam and films with air bubbles
Thickness in mm	40	10
Mass per unit of area in kg/m <sup>2</sup>	90	0,615
Dynamic stiffness in MN/m <sup>3</sup>		13 under load of de 8 kg 10 under load of 4 kg
Installation	Flowed	Laid

**CONCRETE FLOOR** Floor with edge in reinforced concrete thickness 140 mm

### INSTALLATION

The underlay is laid on the floor support with a covering between the strips from 10 to 15.  
 An adhesive aluminium of width 75 manages the preservation of the coverings.  
 The underlay is also used in the edges.  
 It is covered with a polyane film before the pouring of the floating screed.



### NOTICE

The floating screed is unloaded.  
 Its duration of drying is one month.

### MEASUREMENT CONDITIONS

#### Emission room:

##### Test 1:

Temperature: 24 °C  
 Relative humidity: 32 %

##### Test 2:

Temperature: 22 °C  
 Relative humidity: 21 %

#### Reception room:

Temperature: 22 °C  
 Relative humidity: 36 %

Temperature: 20.3 °C  
 Relative humidity: 35 %

# IMPROVEMENT OF THE IMPACT SOUND INSULATION $\Delta L$ OF A FLOATING FLOOR

**Test** 7  
**Date** 06 & 18/03/03  
**Station** DELTA

CD66

**REQUESTER**
**KdB Isolation**
**MANUFACTURER**
**FOATING SCREED**
**UNDERLAY**
**NAME**

CSTB

KdB Isolation

**CHARACTERISTICS**
**AIRFLEX**

Nature

 No armed cement mortar  
 concrete floor

 Fireproofed polyethylene foam and  
 films with air bubbles

Thickness in mm

40

10

 Mass per unit of area in  $\text{kg/m}^2$ 

90

0,615

 Dynamic stiffness in  $\text{MN/m}^3$ 

13 under load of de 8 kg

10 under load of 4 kg

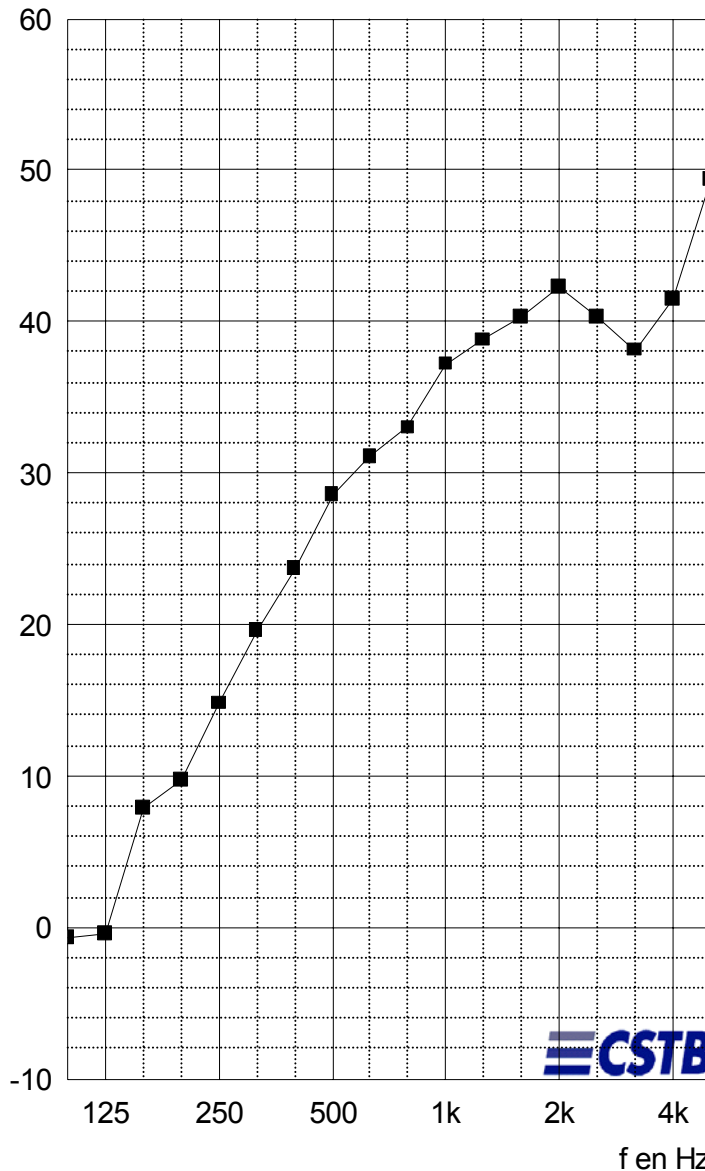
Installation

Flowed

Laid

**CONCRETE FLOOR**

Floor with edge in reinforced concrete thickness 140 mm

**RESULTS**
 $\Delta L$  en dB


f	$\Delta L$
100	-0,7
125	-0,4
160	7,9
200	9,7
250	14,8
315	19,6
400	23,7
500	28,6
630	31,1
800	33,0
1000	37,2
1250	38,8
1600	40,3
2000	42,3
2500	40,3
3150	38,1
4000	41,5
5000	49,4
Hz	dB

(\*) : valeur corrigée. (+) : limite de poste.

$$\Delta L_w = 24 \text{ dB}$$

Pour information :

 $C_{A} = -14 \text{ dB}$ 
 $\Delta L = 26 \text{ dB(A)}$

**IMPROVEMENT OF THE IMPACT SOUND INSULATION  $\Delta L$   
 OF A FLOATING FLOOR**

Test 7  
 Date 06 & 18/03/03  
 Station DELTA

REQUESTER	KdB Isolation	
	<b>FOATING SCREED</b>	<b>UNDERLAY</b>
<b>MANUFACTURER</b>	CSTB	KdB Isolation
<b>NAME</b>		AIRFLEX
<b>CHARACTERISTICS</b>		
Nature	No armed cement mortar concrete floor	fireproofed polyethylene foam and films with air bubbles10
Thickness in mm	40	0,615
Mass per unit of area in kg/m <sup>2</sup>	90	13 under load of de 8 kg
Dynamic stiffness in MN/m <sup>3</sup>		10 under load of 4 kg
Installation	Flowed	laid

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- \* floating screed:
  - Nature: no armed cement mortar
  - Mass per unit of area in Kg/m<sup>2</sup>: 90
  - Thickness: 40



## IMPROVEMENT OF THE IMPACT SOUND INSULATION $\Delta L$ OF A FLOATING FLOOR

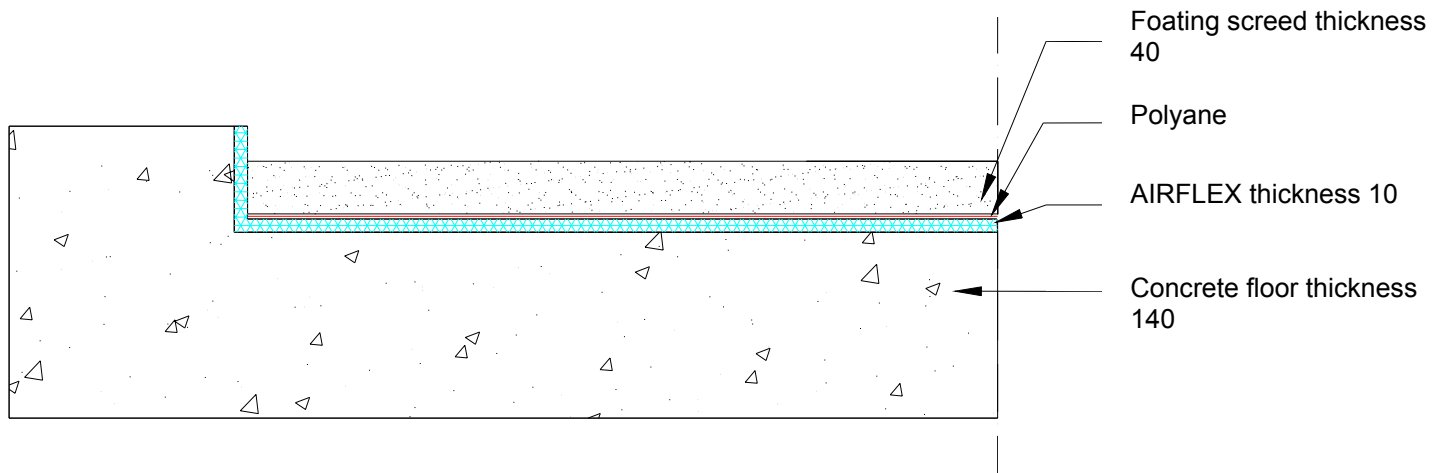
Test 7  
Date 06 & 18/03/03  
Station DELTA

REQUESTER	KdB Isolation	
	<b>FOATING SCREED</b>	<b>UNDERLAY</b>
<b>MANUFACTURER</b>	CSTB	KdB Isolation
<b>NAME</b>		AIRFLEX
<b>CHARACTERISTICS</b>		
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Installation	Flowed	Laid

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#### Emission room:

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Temperature: 24 °C  
Relative humidity: 32 %

##### Test 2:

Temperature: 22 °C  
Relative humidity: 21 %

#### Reception room:

Temperature: 22 °C  
Relative humidity: 36 %

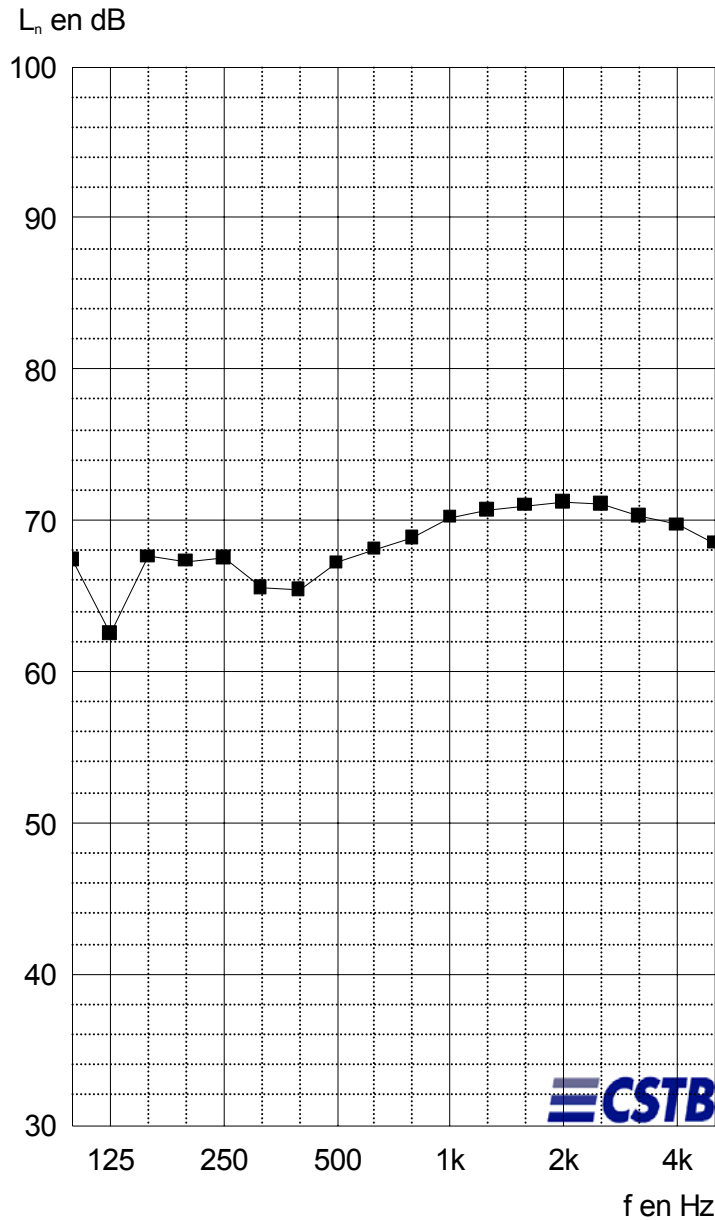
Temperature: 20.3 °C  
Relative humidity: 35 %

## APPENDIX 1 - TEST n° 8

### STANDARDIZED IMPACT SOUND LEVEL $L_n$ OF THE CONCRETE FLOOR

The results are obtained according to the standards NF IN 140-1, NF IN 20140-2, NF IN ISO 140-6 and NF IN ISO 717/2

#### RESULTS



f	$L_n$
100	67,4
125	62,5
160	67,6
200	67,3
250	67,5
315	65,5
400	65,4
500	67,2
630	68,1
800	68,8
1000	70,2
1250	70,7
1600	71,0
2000	71,2
2500	71,1
3150	70,3
4000	69,7
5000	68,5
Hz	dB

(\*) : valeur corrigée. (+) : limite de poste.

$L_{n,w} = 77$  dB

Pour information :

$C_i = -12$  dB

$L_n = 81$  dB(A)

**APPENDIX 2 – APPARATUS**
**STATION DELTA**

Emission room: DELTA 3

DÉSIGNATION	MARQUE	TYPE	N° CSTB
Microphone system	Bruël & Kjær	Microphone 4190	ACOU 01 005
	Bruël & Kjær	Preamplifier 2669	
Rotating arm	Bruël & Kjær	3923	ACOU 97 21
Amplifier	LAB GRUPPEN	LAB1000	ACOU 97 47
Speaker	CSTB-PHL AUDIO	Cube	ACOU 97 35
Speaker	CSTB-PHL AUDIO	Cube	ACOU 97 36

Reception room: DELTA 2

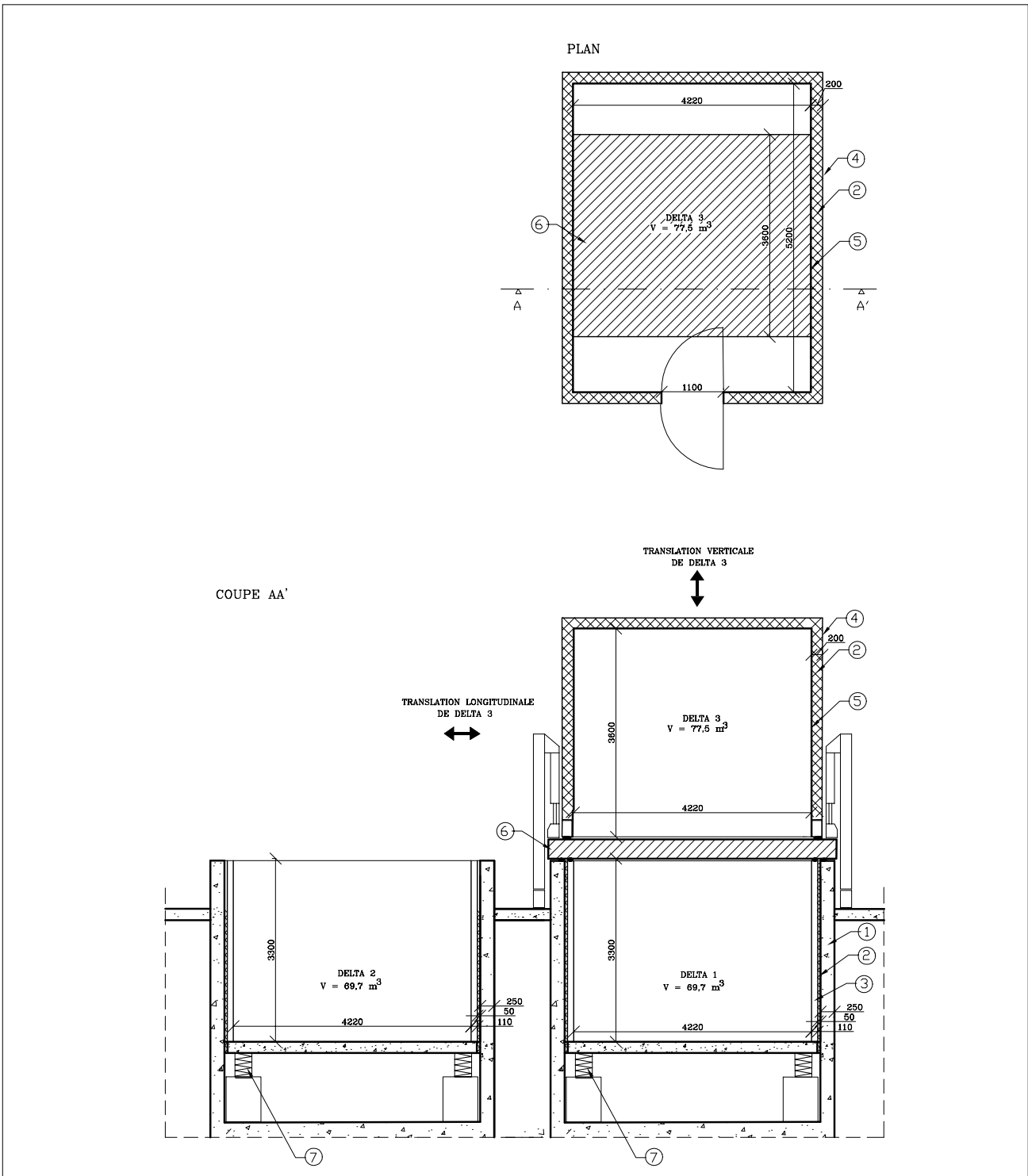
DÉSIGNATION	MARQUE	TYPE	N° CSTB
Microphone system	Bruël & Kjær	Microphone 4190	ACOU 01 006
	Bruël & Kjær	Preamplifier 2669	
Rotating arm	Bruël & Kjær	3923	ACOU 90 14
Amplifier	CARVER	PM600	ACOU 91 11
Speaker	CSTB-ELECTRO VOICE	Pyramid	ACOU 97 53

Control room

DESIGNATION	BRAND	TYPE	CSTB No
Real Time Analyser	Bruël & Kjær	2144	ACOU 96 7
Micro computer	DELL	OPTIPLEX GX 270	
Calibrator	Bruël & Kjær	4231	ACOU 95 5

**APPENDIX 2 – DRAWING OF THE TEST STATION**

**STATION DELTA**



dimensions en mm

7	Boîte à ressort	échelle:	1/100
6	Surface de l'ouverture S=15 m²		
5	Tôle acier 6mm	<b>POSTE DELTA</b>	
4	Tôle acier 2mm		
3	Bloc de béton plein e=100 mm		
2	Laine minérale	<b>ACOUSTIQUE</b>	
1	Béton e=200 mm		
REP	DESIGNATION		

**END OF REPORT**