



Centre d'Etude et de
Développement en
Ingénierie Acoustique

Sart Tilman, le 17 avril 1997.

Directeur : Prof. Dr. Ir. J. DENDAL

Campus Universitaire du Sart Tilman
Bâtiment B28 - Parking P32
B-4000 SART TILMAN (LIEGE 1)

Tél : +32 4 366 26 51
Fax : +32 4 366 26 49

PITTSBURG CORNING EUROPE S.A./N.V.
A l'attention de Monsieur G. VANDENBULCKE

Waterloo Office Park - Building C
Drève Richelle, 161

B-1410 WATERLOO

Ref.: 97/3104 - GD/mm.

**SUBJECT : MEASUREMENT OF THE SOUND REDUCTION INDEX OF A FOAMGLAS®
T4 CELLULAR GLASS WALL**

I. CONTENTS OF THE REPORT

This report contains 3 explanatory pages and one annex giving the measuring results.

II. GENERAL

10 boxes (5 of them marked with the number 548895 and 5 of them marked with the number 549139) were neutrally chosen in the PITTSBURGH CORNING factory by Mr. J. NEMERLIN, Managing Engineer of the CEDIA laboratory, on February 19, 1997.
The measurements were carried out on March 14, 1997 after 8 days of drying in the laboratories of the "Applied Acoustics Service" on the campus of Sart Tilman by:

- Mr. G. DUKERS, Technician at CEDIA.

III. MEASURING EQUIPMENT

- 1 electronic calibrator (94 dBSL at 1000 Hz) Brüel & Kjær, type 4230, serial number 1441391;
- 1 microphone Larson Davis, type 2541, serial number 1865;
- 1 cathode follower Brüel & Kjær, type 2619, serial number 971165;
- 1 noise generator Brüel & Kjær, type 1405, serial number 560543;
- 1 power amplifier Brüel & Kjær, type 2706, serial number 384544;
- 1 set of six electrodynamic loudspeakers;
- 1 real-time analyzer Brüel & Kjær, type 2131, serial number 680020;
- 1 computer TEXAS INSTRUMENTS 990/10 and its terminals;
- 1 rotatable boom Brüel & Kjær, type 3923, serial number 1357258;
- 1 microphone power supply Brüel & Kjær, type 2084, serial number 1606450.

IV. MEASUREMENT CONDITIONS

The measurements of the sound reduction index were carried out in accordance with the Belgian standard S 01-005 and the standard EN ISO 140-3.

- The window, in which the wall was put up, has a surface of 11,5 m²
- The 10 chosen boxes of cellular glass slabs were received on March 5, 1997
- The wall — made of FOAMGLAS® T4 cellular glass slabs 60 cm x 45 cm (density: 120 kg/m³), thickness 10 cm, adhered together with a two-component bituminous adhesive (PC® 56) — was built on March 6 by PITTSBURGH CORNING between two reverberation chambers having a volume of 135 m³.
- The sealing around the wall was carried out with heavy mastic.
- The testing chambers are designed so as to avoid any lateral noise transmission.
- The sound signal in the emission chamber consists in a white noise
- The sound pressure levels in the emission and reception chambers were successively measured by spatial integration within 64 seconds.
- The sound insulation is calculated by establishing the difference between these levels

$$L_{pme} - L_{pmr}$$

- The sound reduction index is calculated with the following equation:

$$R = L_{pme} - L_{pmr} + 10 \log \frac{S}{A}$$

where:

- S is the surface of the sample, in m²;
- A is the equivalent absorption surface (with a = 1) of the reception chamber.

A is calculated with the following equation:

$$A = 0.161 \frac{V}{T}$$

where:

- V is the volume of the reception chamber, in m³;
- T is the reverberation time of the reception chamber, in seconds.

A measurement of the reverberation time was carried out on about 10 sound level decays.

The arithmetical mean of these results is used to calculate A.

V. MEASURING RESULTS

The diagram and the table giving the values of the sound reduction index measured by 1/3 octave bands are given in annex 1.

The measuring results curve is classified 4b according to NBN S01-400.

The global index, R_w , calculated according to ISO 717, equals 27 dB.

Liège, 17 April 1997

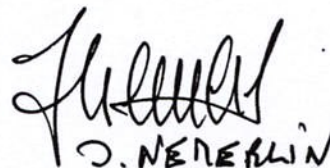
The Technician responsible for the measurements



X. KAISER

Pou G. DUKERS
Technician

The Director of CEDIA



J. NENEKIN

Pou J. DENDAL
Professor

TEST REQUESTED BY : PITTSBURG CORNING EUROPE S.A./N.V.

TYPE OF MEASUREMENT : Sound reduction index according to S01-005 and ISO 140/3

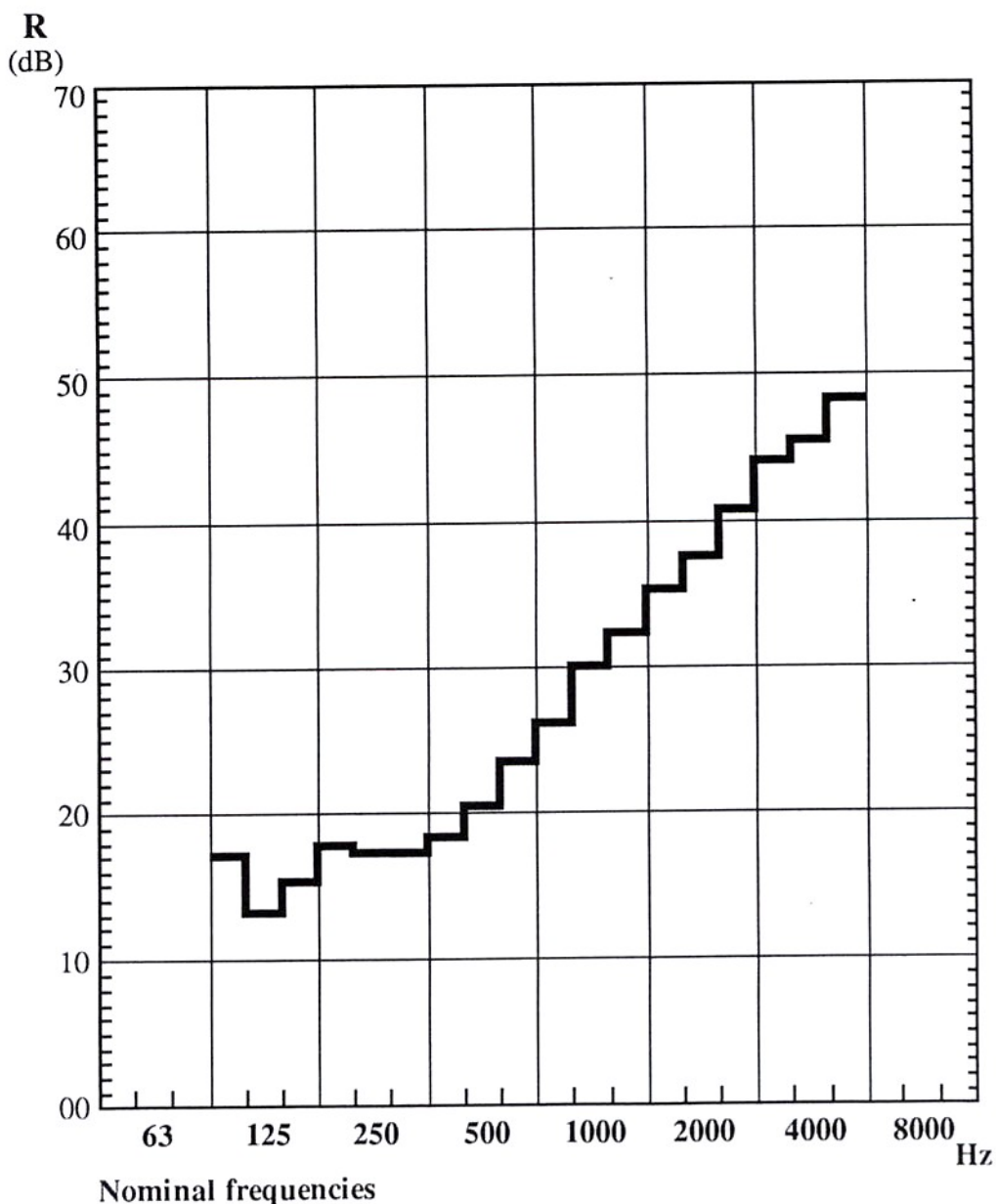
DESCRIPTION OF THE SAMPLE :

Wall made of FOAMGLAS® T4 cellular glass slabs 60 cm x 45 cm (density : 120 kg/m³), thickness 10 cm, adhered together with a two-components bituminous adhesive (PC® 56).

F (Hz)	R (dB)
50	
63	
80	
100	17,3
125	13,3
160	15,5
200	17,9
250	17,5
315	17,5
400	18,5
500	20,7
630	23,7
800	26,3
1000	29,9
1250	32,5
1600	35,5
2000	37,8
2500	40,9
3150	44,4
4000	45,8
5000	48,4

cat.	-4b
------	-----

Rw	27
----	----



CEDIA

CENTRE D'ETUDE ET DE
DEVELOPPEMENT
EN INGENIERIE ACOUSTIQUE

CAMPUS UNIVERSITAIRE DU SART-TILMAN
BATIMENT B 28 PARKING P32

B 4000 SART-TILMAN PAR LIEGE 1

TEL : 04- 366.26.51

FAX : 04- 366.26.49

REPORT N° : 97/3104

ANNEX N° : 1

DATE : 11 april 1997