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Registro Imprese
Rimini n. 00549540409
Cap. Soc. € 880.000 i.v.

TEST REPORT NO. 207808

Place and Date of Issue: Bellaria, 22/02/2006

Client: Flexshield Group Pty Ltd

Date of test request: 11/01/2006

Order number and date: 31401, 16/01/2006

Date of receipt of the sample: 20/01/2006

Test execution date: 03/02/2006

Test object: Determination of the soundproofing power of a panel portion according to the standards UNI EN ISO 140-3: 1997 and UNI EN6 ISO 717-1: 1997.

Test site: Jordan Institute s.p.a. - Block 3 - Via Verga, 19 - 47030 Gatteo (FC)

Origin of the sample: Supplied by the Client

Identification of the sample in acceptance: No 2006/0316

Name of the sample:

The specimen under test is called 'V100 (nominal thickness 100mm with plasterboard central septum, nominal thickness 10mm, and with additional galvanized steel sheet, thickness 1.0mm, placed inside the solid sheet)'.



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This test report is composed of 9 sheets



Sample description:

The tested sample consists of a panelling portion made by assembling 4 modular panels and having the following dimensional characteristics:

- | | |
|--|--------------------|
| - Nominal width of the modular panel | 450mm |
| - Nominal length of the modular panel | 1480mm |
| - Nominal thickness of the modular panel | 100mm |
| - Total nominal width of the panelling | 1230mm |
| - Total nominal height of the panelling | 1480mm |
| - Total nominal thickness of the panelling | 100mm |
| - Useful acoustic surface of the panelling (1230 x 1480mm) | 1.82m ² |

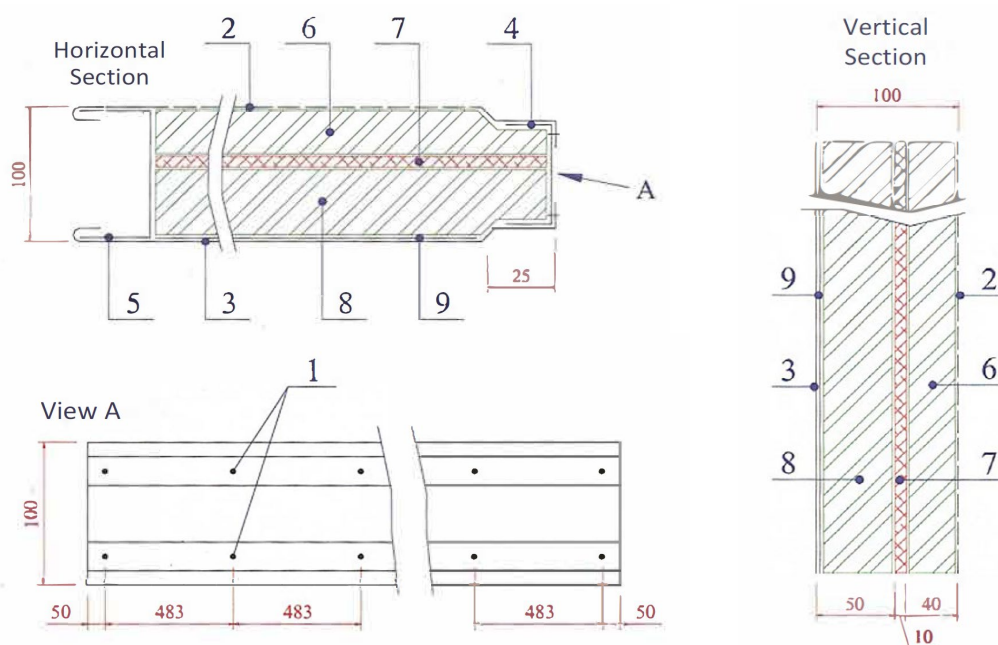
In particular, each modular panel is composed of:

- Box-like containment structure assembled by steel rivets, size 3.4x9 mm, consisting of:
 - Perforated and prepainted galvanized steel sheet, nominal thickness 0.5 mm and hole diameter 2.8 ÷ 7.0 mm, placed on the side facing the noise
 - Full and prepainted galvanized steel sheet, nominal thickness 1.0 mm, placed on the side facing away from the noise
 - 'Male' type lateral interlocking element made with shaped profile in press-bent galvanized sheet steel in the shape of 'U', minimal thickness 2.0 mm
 - 'Female' type lateral joint element made with shaped profile in press-bent galvanized sheet steel in the shape of 'U', nominal thickness 2.0 mm
- Internal insulation formed, starting from the side facing the perforated sheet, from:
 - Rock wool mattress, nominal thickness 40 mm and nominal density 70 kg / m³, covered on the side facing the perforated sheet with glass film
 - Plasterboard sheet, nominal thickness 10 mm
 - Rock wool mattress, nominal thickness 50 mm and nominal density 70 kg / m³, covered on the side facing the perforated sheet with glass film
 - Galvanized steel sheet, nominal thickness 1.5 mm, resting inside the solid sheet of the box-shaped containment structure





Diagram drawing of the Modular Panel:



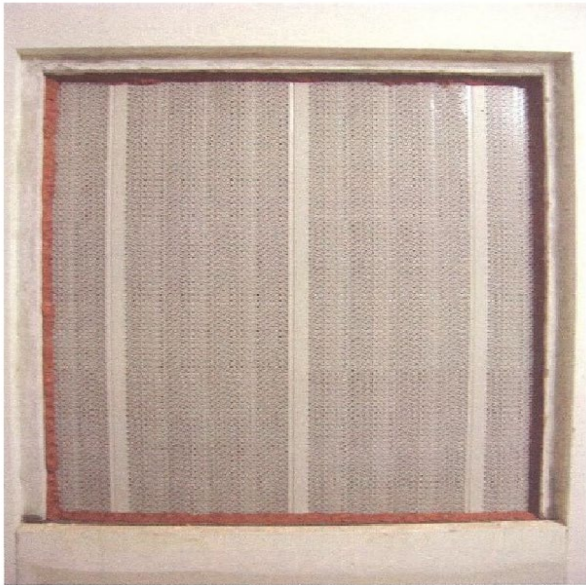
Legend

Symbols	Description
1	Steel rivet, size 3.4 x 9 mm
2	Perforated and prepainted galvanized steel sheet, nominal thickness 0.5 mm and hole diameter 2.8 ÷ 7.0 mm
3	Solid and prepainted galvanized steel sheet, nominal thickness 1.0 mm
4	'Male' side joint element: shaped profile in galvanized steel sheet 'U' shaped bent, nominal thickness 2.0 mm
5	'Female' side joint element: shaped profile in galvanized sheet steel 'U' shaped bent, nominal thickness 2.0 mm
6	Internal insulation: rock wool mattress, nominal thickness 40 mm and nominal density 70 kg / m ³ , Stillato covered facing the perforated sheet with glass film
7	Internal insulation: plasterboard sheet, nominal thickness 10 mm
8	Internal insulation: rock wool mattress, nominal thickness 50 mm and nominal density 70 kg/m ³
9	Galvanized steel sheet, nominal thickness 1.5 mm

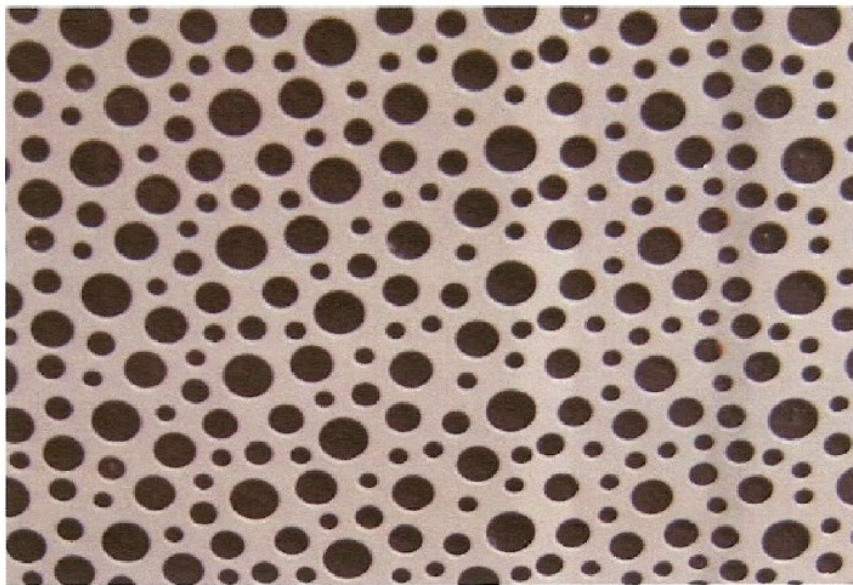




Sample Photograph



Detail of the perforated sheet





Normative Requirements

The test was performed according to the prescriptions of the following rules:

- UNI EN ISO 140-3: 1997 of 09/30/1997 "Acoustics. Measurement of acoustic insulation in buildings and building elements. Laboratory measurement of airborne sound insulation of building elements "
- UNI EN ISO 717-1: 1997 of 31/12/1997 "Acoustics. Evaluation of acoustic insulation in buildings and building elements. Acoustic insulation by air"

Test Equipment

The following equipment was used to perform the test:

- Power amplifier 1000W model "ENERGY 2" of the company LEM
- Omnidirectional acoustic diffuser
- Acoustic diffuser in the receiving room
- 'HD-31' model third-octave equalizer by Applied Research & Technology Inc
- Microphones $\varnothing \frac{1}{2}$ " model '4192' from the company Bruel & Kjaer
- Microphone preamplifiers model '2669' by the company Bruel & Kjaer
- Real-time analyzer 'Symphony' model by the company 01 dB-Stell
- Signal amplifier-conditioner model 'Nexus' by the company Bruel & Kjaer
- Calibrator for the calibration of the '4231' microphones by the company Bruel & Kjaer
- Completion accessories





Test Mode

The test environment consists of two chambers, one of which, defined as the 'transmitting chamber', contains the noise source, while the other, defined as the 'receiving chamber', is acoustically characterized by the equivalent sound absorption.

After placing the sample under examination in the opening between the two chambers of the test environment, the sound pressure level at various frequencies was measured, in the range between 100 Hz and 5000 Hz, both in the emitting and receiving rooms, and to verify the reverberation times of the latter in the same field of work.

The evaluation index 'Rw' of the soundproofing power 'R' is equal to the value in dB of the reference curve 500 Hz according to the procedure of the UNI EN ISO 717-1: 1997 standard.

The soundproofing power 'R', which equals 10 times the decimal logarithm of the ratio between the incident sound power and the sound power transmitted through the sample, was calculated using the following formula:

$$R = L_1 - L_2 + 10 \cdot \log \frac{S}{A}$$

Where

R = Soundproofing power, expressed in dB

L₁ = Average sound pressure level in the emitting chamber, expressed in dB

L₂ = Average sound pressure level in the receiving chamber, expressed in dB

S = Usable measuring surface of the test sample, expressed in m²

A = Equivalent sound absorption area of the receiving room, expressed in m², calculated on its own time using the following formula

$$A = \frac{0.16 \cdot V}{T}$$

Where

V = Volume of the receiving chamber, expressed in m³

T = Reverberation Time, expressed in seconds





Furthermore, as proposed by UNI EN ISO 717-1:1997, 2 corrective terms in dB that take into account the characteristics of particular sound spectra in the source and precisely:

- Corrective term 'C' to be added to the evaluation index 'Rw' with source spectrum relative to A-weighted pink noise
- Corrective term 'C_{tr}' to be added to the evaluation index 'Rw' with source spectrum relative to A-weighted traffic noise

Environmental Conditions at the time of test

Average ambient temperature	14
Relative humidity	55 %





Test Results

Volume of the receiving room 'V'		69.0m ³			
Useful measuring surface of the sample under test 'S'		1.82m ²			
Microphone positions		Rotating rod with circular path, 1m radius			
Sound field generation		Mobile speaker with straight path, length 1.6m x 2 (round trip)			
Frequency Hz	L ₁ dB	L ₂ dB	T S	R dB	Reference Curve
100	99.9	64.7	1.24	28.3	28.0
125	98.9	67.7	0.98	23.3	31.0
160	94.5	61.1	1.23	26.5	34.0
200	97.7	59.7	1.42	31.7	37.0
250	96.8	54.9	1.49	35.8	40.0
315	96.0	47.3	1.34	42.1	43.0
400	93.7	43.0	1.34	42.1	43.0
500	93.4	42.4	1.50	44.9	47.0
630	93.5	39.4	1.34	47.5	48.0
800	96.4	40.7	1.45	49.5	49.0
1000	94.8	36.1	1.39	52.3	50.0
1250	94.4	33.2	1.36	54.7	51.0
1600	93.5	32.1	1.34	54.8	51.0
2000	94.2	35.0	1.29	52.5	51.0
2500	95.2	33.6	1.18	54.5	51.0
3150	94.3	34.4	1.18	54.5	51.0
4000	95.0	35.0	1.11	52.6	//
5000	93.1	33.0	1.03	52.4	//





Usable surface of the sample:

1.82m²

Volume of the issuing

chamber:

57.0m³

Volume of the receiving

room:

69.0m³

Noise type:

Pink

Filter type:

$\frac{1}{3}$ octave

Test result:

Evaluation index at 500Hz in
the frequency band between
100Hz and 3150Hz

R_w = 47 dB*

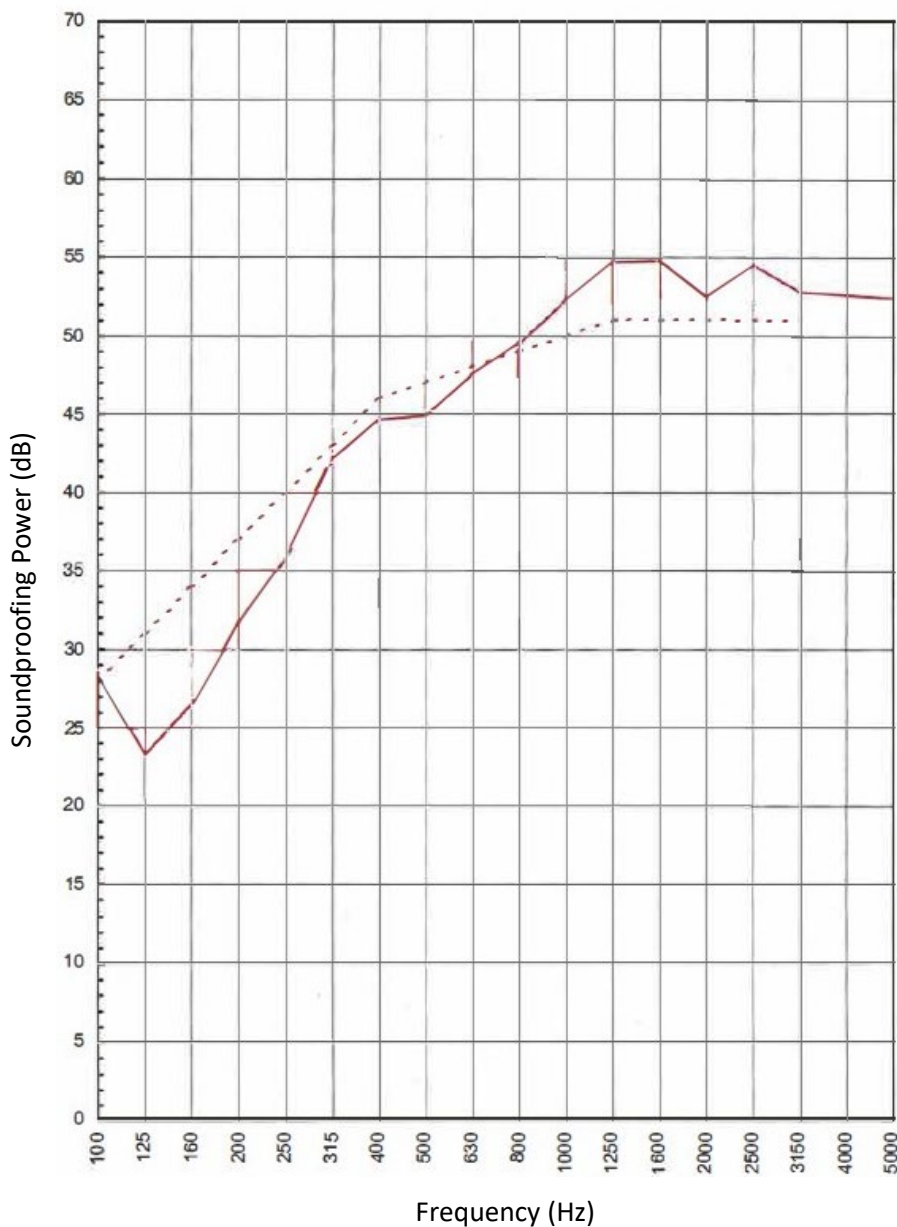
Correction terms:

C = -3 dB

C_{tr} = -8 dB

*Evaluation index of the
soundproofing power developed in
steps of 0.1 dB

47.3dB



— Experimental Findings - - - Reference Curve

Il Responsabile
Tecnico di Prova
(Geom. Omar Nanni)

Umar Nanni



Responsabile del Laboratorio
di Acustica e Vibrazioni
(Dott. Andrea Bruschi)

Andrea Bruschi

Il Presidente o
l'Amministratore Delegato
Il Procuratore

Dott. Ing. Stefano Vasini

Stefano Vasini