

VALIDATION REPORT No. 380918

this document is based on test report No. 246464
issued by Istituto Giordano

Customer

AERCEL MATERIALI ESPANSI CELLULARI S.p.A.
Via Gaetano Giordani, 2 - 40054 BUDRIO (BO) - Italy

Item*

**floor covered with fired tiles and dry-laid covering comprising
resilient blanket called "FONOSPHERA PV50"
and "GIPS FASER H" gypsum fibreboard**

Activity



**comparative measurement of the impact sound
insulation between rooms above each other with
different configurations of the separating floor in
accordance with standard UNI EN ISO 140-7:2000**

Results

Floor condition	initial	covered
Single-number quantity at 500 Hz " $L'_{n,w}$ "	79 dB	57 dB
Adaptation term " C_1 "	-9 dB	1 dB

(*) according to that stated by the customer.

Bellaria-Igea Marina - Italy, 17 March 2021

Chief Executive Officer

Order:
87267

Activity date:
from 5 September 2008 to 11 September 2008

Activity site:
Farm building - Via Montefiorino, 17 - Località
Vergiano - 47900 Rimini (RN) - Italy

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The results relate only to the item examined, as received, and are valid only in the conditions in which the activity was carried out.

This document extends the validity of all numerical and descriptive data contained in the reference test report.

This document is the English translation of the validation report No. 380918 issued in Italian; in case of dispute the only valid version is the Italian one.

Date of translation: 17 March 2021.

The original of this document consists of an electronic document digitally signed pursuant to the applicable Italian Legislation.

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Purpose of measurement

This document gives the results of impact sound insulation measurements carried out on two different configurations of a separating floor covered with fired tiles between two unfurnished rooms above each other fitted with doors and windows and intended for use as living accommodation.

The results will be used to assess the reduction in impact noise levels following installation on the existing floor of a dry-laid covering comprising:

- resilient blanket called “FONOSPHERA PV50”, having a studded surface placed in direct contact with the floor, maximum nominal thickness 10 mm, minimum nominal thickness 5 mm, a composite laminate formed by closed-cell cross-linked polyethylene, density 30 kg/m³, and non-woven fabric, grammage 120 g/m²;
- 3 sheets of “GIPS FASER H” gypsum fibreboard, thickness 12 mm each, supplied by Global Building S.r.l. and having a total surface density of approx. 40 kg/m².



Photos of the floor before and after installation of the covering

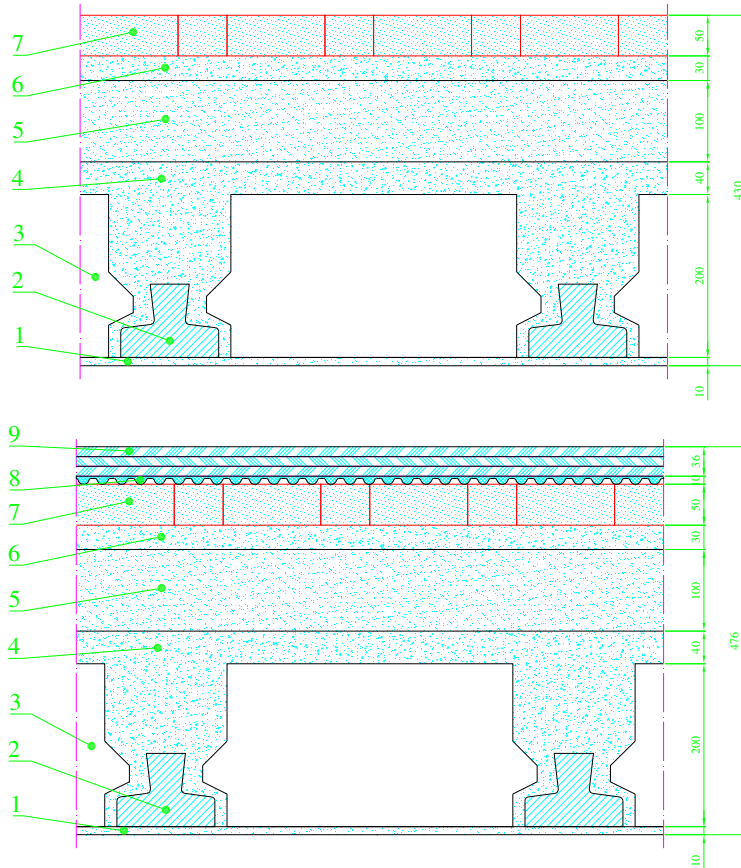


Photo of the covering at the access door



Photo of some “FONOSPHERA PV50” resilient blanket specimens

**CROSS SECTION OF THE FLOOR
BEFORE AND AFTER INSTALLATION OF THE COVERING**



Key

Symbol	Description
1	Plaster
2	Joist
3	Clay-masonry unit
4	Slab
5	Lightweight aggregate concrete screed, density 1200 kg/m ³
6	Pointing mortar
7	Dry-laid tile
8	“FONOSPHERA PV50” resilient insulation blanket
9	3 sheets of “GIPS FASER H” fibreboard, thickness 12 mm each

Normative references

Standard	Title
UNI EN ISO 140-7:2000	Acoustics - Measurement of sound insulation in buildings and of building elements - Field measurements of impact sound insulation of floors
UNI EN ISO 717-1:2007	Acoustics. Rating of sound insulation in buildings and of building elements. Part 1: Airborne sound insulation

Apparatus

Description
Sinus Messtecnik "Soundbook Quadro 974301.6" four-channel real-time analyser, serial number 6114
PCB Piezotronics "377A02" 1/2" microphone, serial number 101219
PCB Piezotronics "426E01" microphone preamplifier, serial number 1698
01 dB "Cal 21" 94 dB-1000 Hz acoustic calibrator, serial number 51031017
Look Line "DL 301" dodecahedral speaker
Look Line "D 301" power amplifier
Brüel & Kjær standard tapping machine - type "3204", serial number 763690
Complementary accessories

Method

The test environment comprises two rooms: the upper one, on whose floor the tapping machine is laid, is called the "source room", whilst the lower one, called the "receiving room", is characterised acoustically by the equivalent sound absorption area.

The standard tapping machine was positioned in the area between the two rooms and with the hammer connecting line orientated at 45° to the direction of the room's perimeter walls.

Having positioned the instrumentation, the sound pressure level was measured at various frequencies within the range 100 Hz to 5000 Hz in the receiving room and the latter's reverberation times in the same operating range were also recorded.

The weighted normalised single-number quantity " $L'_{n,w}$ " of the normalised impact sound pressure level " L'_n " is equal to the value in dB of the relevant reference curve at 500 Hz in accordance with the method specified by standard UNI EN ISO 717-2:2007.

The normalised impact sound pressure level " L'_n " was calculated using the following formula:

$$L'_n = L_1 + 10 \cdot \log \frac{A}{A_0}$$

where: A_0 = reference sound absorption area, = 10 m²;

A = equivalent sound absorption area in the receiving room, expressed in m², in turn calculated using the following equation:

$$A = \frac{0,16 \cdot V}{T}$$

where: V = receiving room volume, expressed in m³;

T = reverberation time, in seconds.

Where necessary, the average impact sound pressure level in the receiving room is corrected for background noise using the following equation:

$$L = 10 \cdot \log \left(10^{\frac{L_{sb}}{10}} - 10^{\frac{L_b}{10}} \right)$$

where: L_{sb} = the level of signal from the tapping machine and background noise combined, in dB;

L_b = background noise level, in dB.

In addition, as proposed by standard UNI EN ISO 717-2:2007, the spectrum adaptation term for impact sound level “ C_i ” was calculated in the frequency range 100 Hz to 2500 Hz , this being added to “ $L'_{n,w}$ ” in order to take into account level peaks at single frequencies.

Environmental conditions

Average temperature	28 °C
Average relative humidity	60 %

Results

Test room characteristics

Source room volume	40,2 m ³
Receiving room volume	116,5 m ³
Surface area between the two rooms	17,2 m ²
Microphone positions	2 microphone positions in the receiving room for each position of the standard tapping machine
Generation of sound field	5 positions of the standard tapping machine

FLOOR IN THE INITIAL CONDITION

Date of test	05/09/2008
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Frequency [Hz]	L₁ [dB]	T [s]	L'_n [dB]	Reference curve [dB]
100	62,3	1,27	64,0	81,0
125	69,4	1,46	70,5	81,0
160	67,5	1,24	69,4	81,0
200	68,2	1,07	70,7	81,0
250	68,6	0,84	72,1	81,0
315	67,9	0,75	71,9	81,0
400	69,2	0,77	73,1	80,0
500	71,4	0,84	74,9	79,0
630	72,2	0,90	75,4	78,0
800	69,9	0,86	73,3	77,0
1000	69,0	0,73	73,2	76,0
1250	70,7	0,75	74,7	73,0
1600	70,6	0,70	74,9	70,0
2000	69,8	0,68	74,3	67,0
2500	67,5	0,65	72,2	64,0
3150	66,1	0,63	70,9	61,0
4000	64,9	0,61	64,9	//
5000	59,1	0,56	59,1	//

Values not affected by background noise.

Single-number quantity at 500 Hz "L'_{n,w}"	79 dB
Adaptation term "C₁"	-9 dB

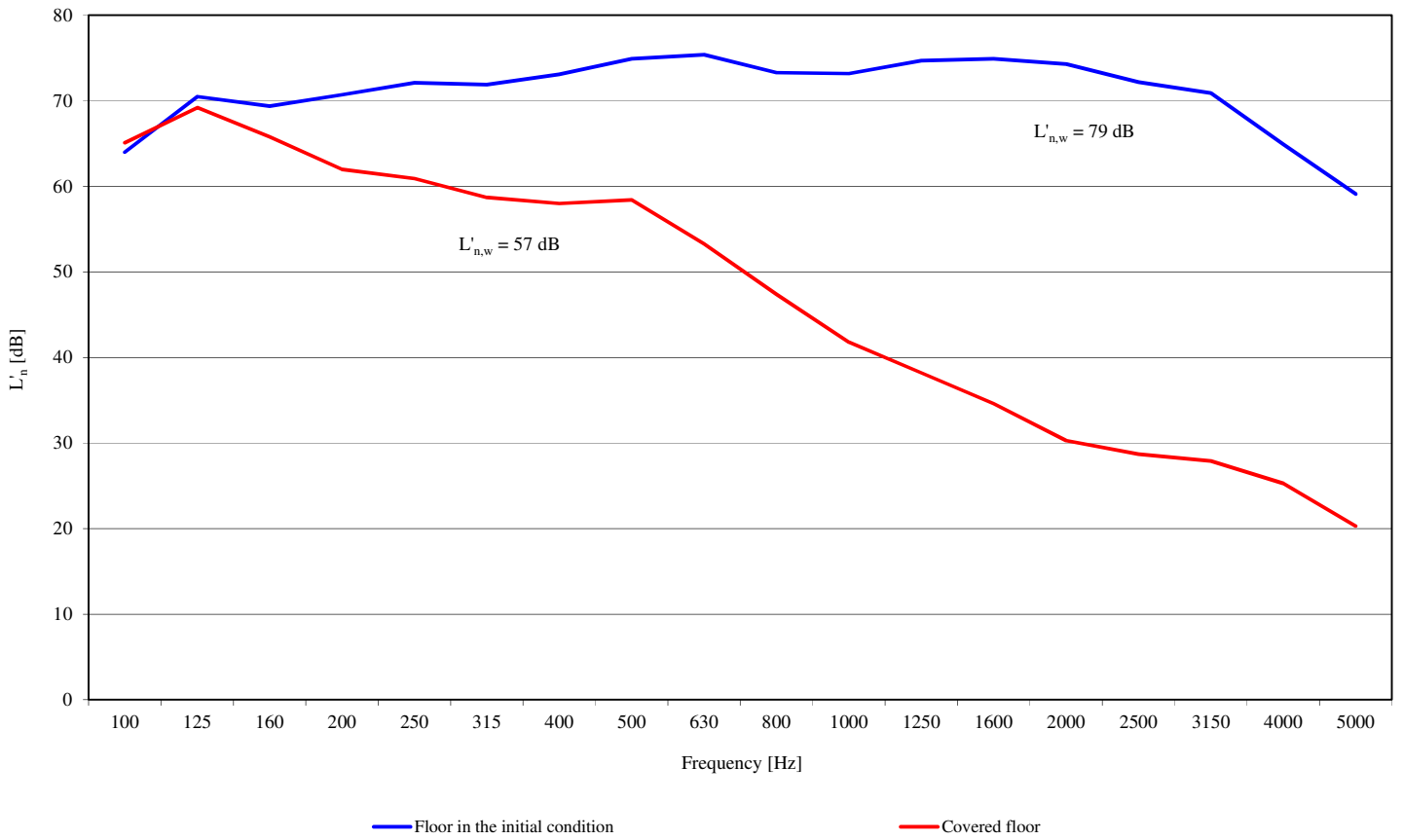
COVERED FLOOR

Date of test	11/09/2008
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Frequency	L₁	T	L'_n	Reference curve
[Hz]	[dB]	[s]	[dB]	[dB]
100	63,4	1,27	65,1	59,0
125	68,1	1,46	69,2	59,0
160	63,9	1,24	65,8	59,0
200	59,5	1,07	62,0	59,0
250	57,4	0,84	60,9	59,0
315	54,7	0,75	58,7	59,0
400	54,1	0,77	58,0	58,0
500	54,9	0,84	58,4	57,0
630	50,1	0,90	53,3	56,0
800	44,0	0,86	47,4	55,0
1000	37,6	0,73	41,8	54,0
1250	34,2	0,75	38,2	51,0
1600	30,3	0,70	34,6	48,0
2000	25,8	0,68	30,3	45,0
2500	24,0	0,65	28,7	42,0
3150	23,1	0,63	27,9	39,0
4000	20,4	0,61	20,4	//
5000	15,0	0,56	15,0	//

Values not affected by background noise.

Single-number quantity at 500 Hz "L'_{n,w}"	57 dB
Adaptation term "C₁"	1 dB



Comparative graph of the test results for the two floor setups