

VALIDATION REPORT No. 380917

this document is based on test report No. 246461
issued by Istituto Giordano

Customer

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

Item*

**studded specimens named
"FONOSPHERA PV50"**

Activity



**determination of apparent dynamic stiffness in
accordance with standard UNI EN 29052-1:1993**

Results

Rigidità dinamica apparente media

$\overline{s'_t} = 20 \text{ MN/m}^3$

Order:
87267

Activity date:
from 16 September 2008 to 22 September 2008

Activity site:
Istituto Giordano S.p.A. - Blocco 3 - Via Verga, 19
- 47043 Gatteo (FC) - Italy

Contents	Page
Description of item*	2
Normative references	2
Apparatus	2
Method	2
Environmental conditions	3
Results	3

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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. 380917 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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Page 1 of 3

(*) according to that stated by the customer.

Bellaria-Igea Marina - Italy, 17 March 2021

Chief Executive Officer

Description of item*

The item under examination comprises 6 studded specimens, nominal size 200 mm × 200 mm, maximum nominal thickness 10 mm and minimum nominal thickness 5 mm, composite laminates formed by a studded layer of closed-cell cross-linked polyethylene, density 30 kg/m², and non-woven fabric, grammage 120 g/m².



Photo of some test specimens

Normative references

Standard	Title
UNI EN 29052-1:1993	Acoustics. Determination of dynamic stiffness. Materials used under floating floors in dwellings

Apparatus

Description
Sinus "Soundbook" real-time analyser
Syntrillium "Cool Edit" digital sound editor software
DJB Instruments "A/120/V" accelerometer
Gearing & Watson Electronics "V2" shaker
Gearing & Watson Electronics "PA30E" power amplifier
PCB Piezotronics "208C01" force sensor
Kern "572-49" electronic balance
gauge with 10 μ resolution
complementary accessories

Method

Each specimen was placed between a steel baseplate, approx. weight 120 kg, and a steel load plate, plan-view dimensions 200 mm × 200 mm, to which the accelerometer, shaker and force sensor were connected. After exciting the load plate, the frequency of a sinusoidal signal was varied whilst at the same time carrying out FFT measurement of acceleration in order to determine the resonant frequency and applied force.

(*) according to that stated by the customer, apart from characteristics specifically stated to be measurements; Istituto Giordano declines all responsibility for the information and data provided by the customer that may influence the results.

The apparent dynamic stiffness “ s'_t ” of each specimen was calculated using the following equation:

$$s'_t = 4 \cdot \pi^2 \cdot m' \cdot f_R^2$$

where: s'_t = apparent dynamic stiffness in MN/m³;

m' = mass per unit area of the vibrating baseplate and measuring device in kg/m²;

f_R = resonant frequency in Hz.

The average apparent dynamic stiffness $\overline{s'_t}$ was calculated using the following equation:

$$\overline{s'_t} = \frac{\sum_{i=1}^n s'_{ti}}{n}$$

where: $\overline{s'_t}$ = average apparent dynamic stiffness in MN/m³;

s'_{ti} = apparent dynamic stiffness of the i -th specimen in MN/m³;

n = number of items.

Environmental conditions

Atmospheric pressure	1000 mbar
Average ambient temperature	20 °C
Relative humidity	50 %

Results

Mass of the vibrating baseplate	8,1937 kg
Mass of accelerometer	0,0180 kg
Total mass	8,2117 kg
Total mass per unit area “ m' ”	205,2925 kg/m ²
Load plate excitation method	Sinusoidal signal
Quantity measured	Acceleration
Dependence of the resonant frequency “ f_R ” on the excitation force	No
Specimens preload	100 kg/m ²

Specimen [No.]	Average maximum thickness under applied load [mm]	Weight [g]	Resonant frequency “ f_R ” [Hz]	Apparent dynamic stiffness “ s'_t ” [MN/m ³]	Average apparent dynamic stiffness “ $\overline{s'_t}$ ” [MN/m ³]
1	6	19,5	50	20	20
2	6	20,0	48	19	
3	6	19,0	48	19	
4	6	19,5	48	19	
5	6	19,5	50	20	
6	6	19,5	50	20	