VALIDATION REPORT No. 380293

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issued by Istituto Giordano

Customer

AERCEL MATERIALI ESPANSI CELLULARI S.p.A.

Via Gaetano Giordani, 2 - 40054 BUDRIO (BO) - Italy

Item*

two-ply studded specimens named "FONOSPHERA SF51"

Activity

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

Results

Rigidità dinamica apparente media	$\overline{s'_t}$ **= 21 MN/m³**

(*) according to that stated by the customer.

Bellaria-Igea Marina - Italy, 25 February 2021

Chief Executive Officer

Order:
87267

Identification of item received:
2008/0814 dated 2 April 2008

Activity date:
8 April 2008

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

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Reviewer: Dott. Andrea Cucchi

Description of item*

The item under examination comprises 6 two-ply studded specimens, nominal size 200 mm × 200 mm, maximum nominal thickness 7 mm and minimum nominal thickness 2 mm, formed by a studded layer of closed-cell cross-linked polyethylene, density 30 kg/m², and a layer of polymer mass and mineral fillers, thickness 1 mm.

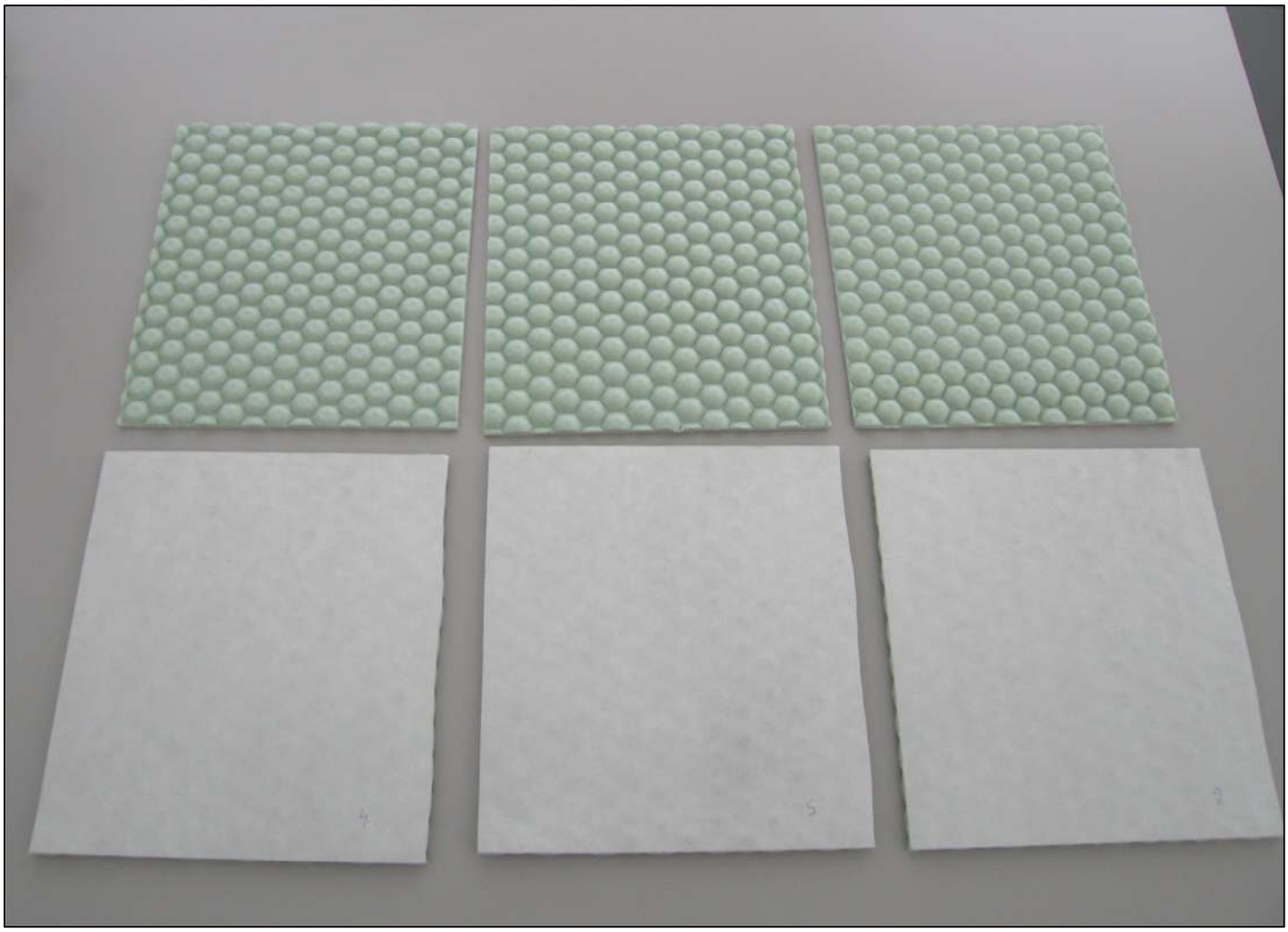

Photo of item

Normative references

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

(*) 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.

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.

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 specimens.

Environmental conditions

Atmospheric pressure	1010 mbar
Average ambient temperature	20 °C
Relative humidity	55 %

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/m²
Load plate excitation method	Sinusoidal signal
Quantity measured	Acceleration
Dependence of the resonant frequency "f_R" on the excitation force	No
Specimen preload	No

Specimen [No.]	**Average maximum thickness under applied load** [mm]	**Weight** [g]	**Resonant frequency "f_R"** [Hz]	**Apparent dynamic stiffness "s'_t"** [MN/m³]	**Average apparent dynamic stiffness "$\overline{s'_t}$"** [MN/m³]
1	6,5	101,2	53	23	21
2	6,5	99,5	48	19	
3	6,5	102,1	48	19	
4	6,5	99,6	50	20	
5	6,5	101,3	50	20	
6	6,5	103,6	54	24	