

Test Report

Report nº ACL 171/19

Date: 2019/08/07

Requested by:

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Manufacturer and test specimen identification:

Name*: Amorim Isolamentos, S.A.
 Test specimen*: MDFACADE POINTCLOUD Board

 Sampling responsibility*: Customer

Test data:

Test: Laboratory test: Measurement of sound absorption in a reverberation room

Date: 2019/06/17

Reverberation room without test specimen:

Temperature (°C): 18,5 ± 1

Relative humidity (%): 68,1 ± 5

Static pressure (mbar): 1010,1 ± 5

Test Method: NP EN ISO 354:2007

Operator(s): João Vieira

Reverberation room with test specimen:

Temperature (°C): 18,5 ± 1

Relative humidity (%): 66,7 ± 5

Static pressure (mbar): 1010,2 ± 5

Test equipment:

Acoustic chambers at Itecons of cubic shape with approximately 5,85 m edges and double layered reinforced concrete walls with masonry units about 50cm thick; "Brüel & Kjær" pulse multianalyser system, PUL02, model 3560-C-T46, with five acquisition channels; "Brüel & Kjær" 1/2" microphone, type 4190, MIC06; "Brüel & Kjær" rotating microphone boom, type 3923, GIR05; "Brüel & Kjær" sound level meter calibrator, type 4231, CLS03; termohygrometer, THR09; omnidirectional sound source OMNIPOWER 4292-L, from "Brüel & Kjær", FSO07; barometer, BAR01.

Additional information related with the test:

Number of microphone positions: 3

Number of decays per microphone/source combination: 3

Number of source positions: 4

Evaluation method of reverberation time: Based on decay curves

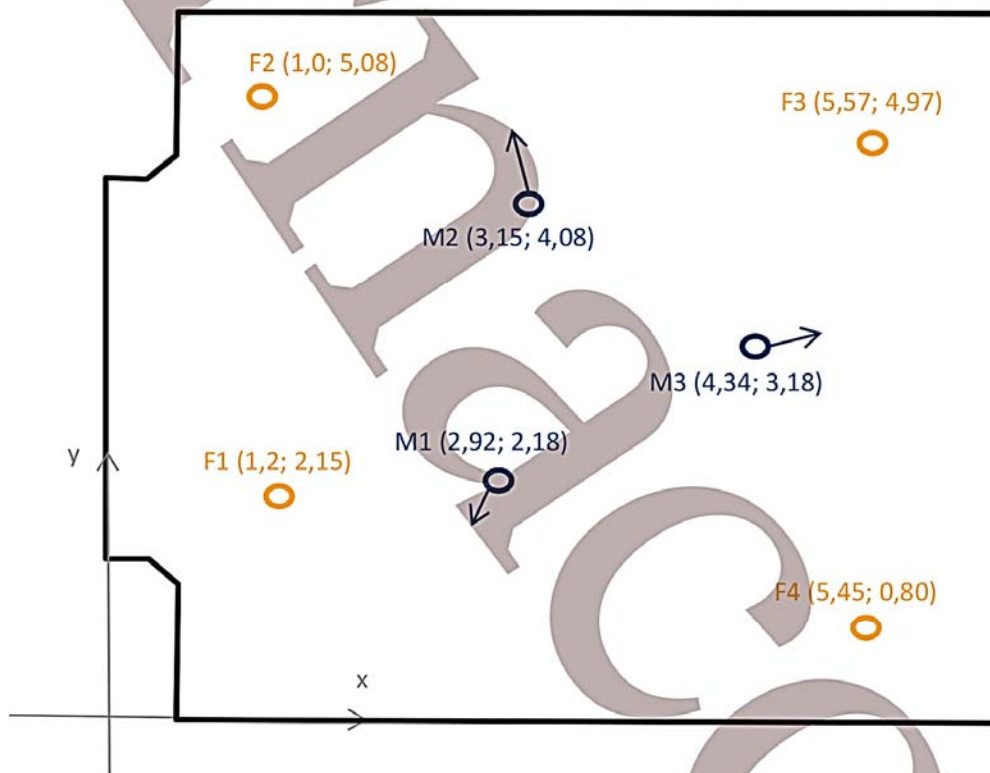
Measurement in bands of: One-third-octave

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 Data reported with * supplied by customer.

Reverberation room description:

The reverberation room has a rectangular shape, in plant, with approximately 5,85 m x 5,85 m and a ceiling height of 5,85 m. In order to comply with NP EN ISO 354:2007, 15 polycarbonate diffusing elements were used, with 30 m² of total area and different concave and convex geometries, randomly placed on the ceiling of the reverberation room, helping to create a diffuse field and to comply with the specified maximum absorption areas. The total surface area of the room (walls, floor and ceiling) is 211,65 m² and the volume of the reverberation room is 203,98 m³.

Schematic representation, in plant, of the reverberation room:



$F_i(x; y)$ - Source position_{*i*}, with coordinates (x, y)

$M_j(x; y)$ - Microphone position_{*j*}, with coordinates (x, y)

Test specimen:

Type: Plane absorber

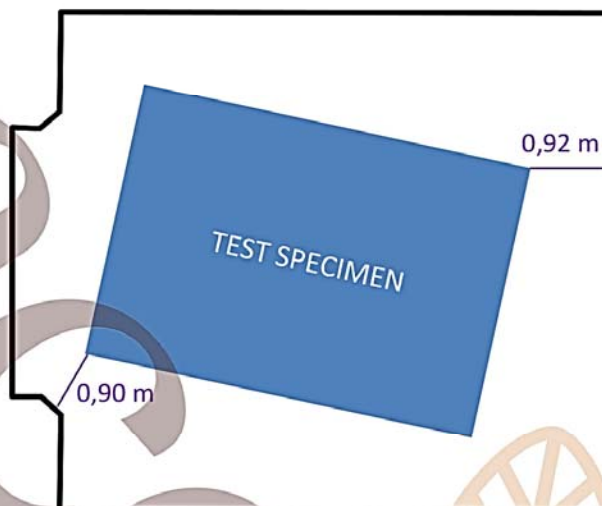
Specimen area (m²): 12,00

Test specimen description:

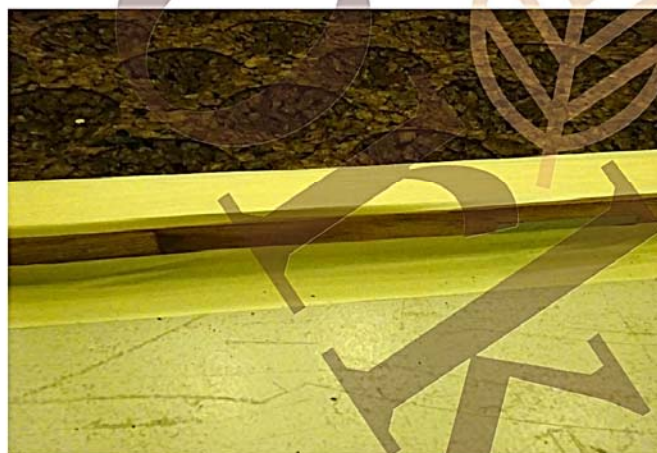
Test specimen with our reference ACL127A/19, with total dimensions of 4000 mm x 3000 mm x 50 mm (length x width x thickness), composed by boards of expanded cork agglomerate (product reference: MDFACADE POINTCLOUD Board), with individual nominal dimensions of 1000 mm x 500 mm x 50 mm (length x width x thickness) and density of approximately 130 kg/m³. The test specimen was placed directly against the floor of the reverberation room, which corresponds to a type "A" mounting according with NP EN ISO 354:2007. The perimeter edge of the test specimen was completed sealed with acoustically reflective frame in wood of 40 mm. The joints between the wooden frame and the floor surface, and between the wooden frame and the test specimen were covered with reflective tape. The placement of the test specimen in the reverberation room followed the indications of standard NP EN ISO 354:2007, with a total area of 12 m² and a ratio of width to length of 0,75. The installation of the test specimen was responsibility of Itecons.

Pictures of the test specimen:

Reverberation room:



Construction details:



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Average reverberation time:

Freq. (Hz)	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
T ₁ (s)	15,08	12,03	9,34	8,57	8,08	7,65	8,52	9,55	9,29	8,64	7,96	7,31	6,50	5,46	4,41	3,79	3,18	2,58
T ₂ (s)	13,56	10,03	8,20	6,66	6,26	5,44	5,17	3,84	3,44	3,64	3,96	3,83	3,52	3,15	2,69	2,35	2,10	1,84

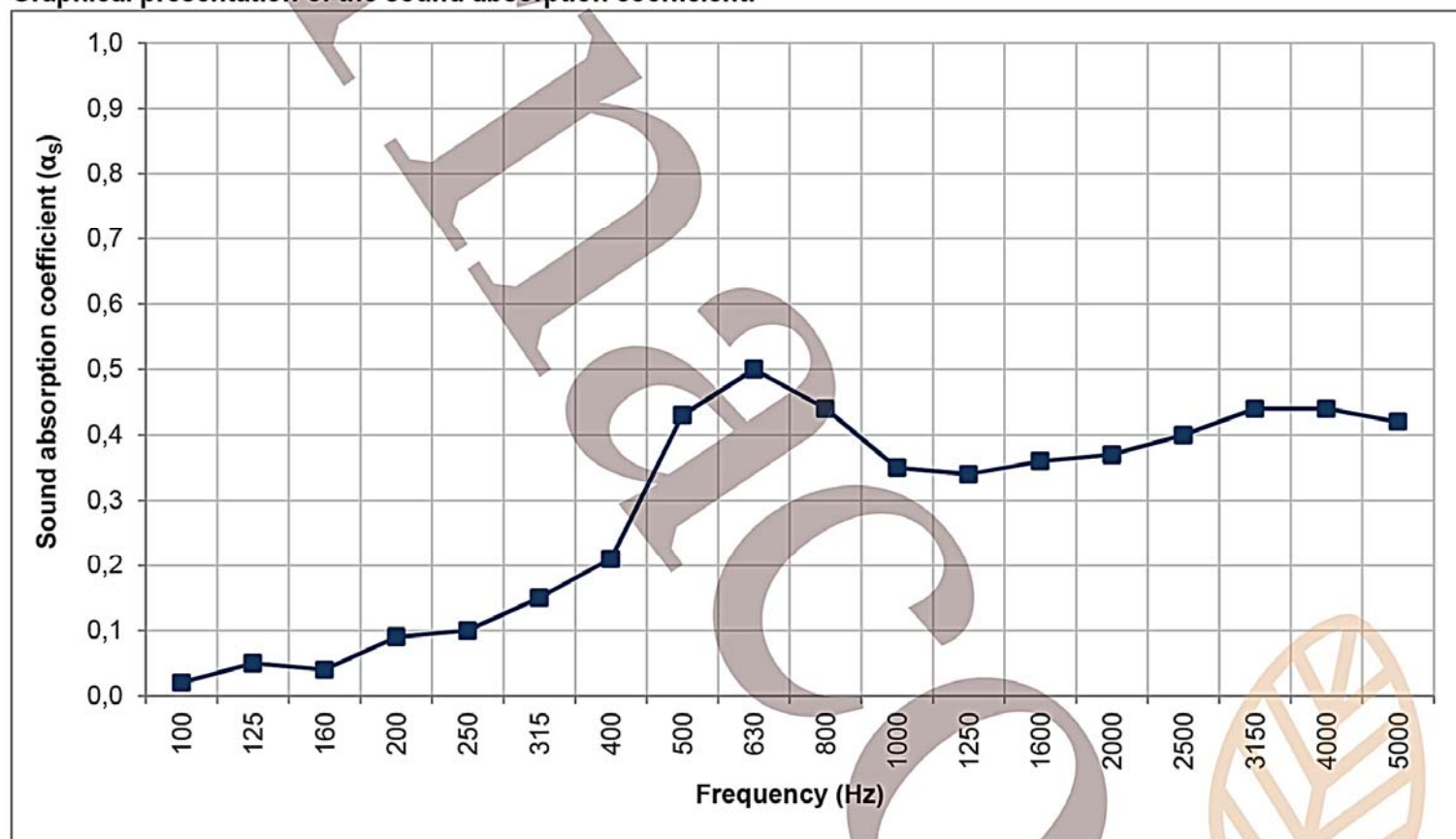
T₁ - Average reverberation time in the reverberation room without the test specimen (s)

T₂ - Average reverberation time in the reverberation room with the test specimen (s)

Sound absorption coefficient (α_s):

Freq. (Hz)	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000
α _s	0,02	0,05	0,04	0,09	0,10	0,15	0,21	0,43	0,50	0,44	0,35	0,34	0,36	0,37	0,40	0,44	0,44	0,42

Graphical presentation of the sound absorption coefficient:



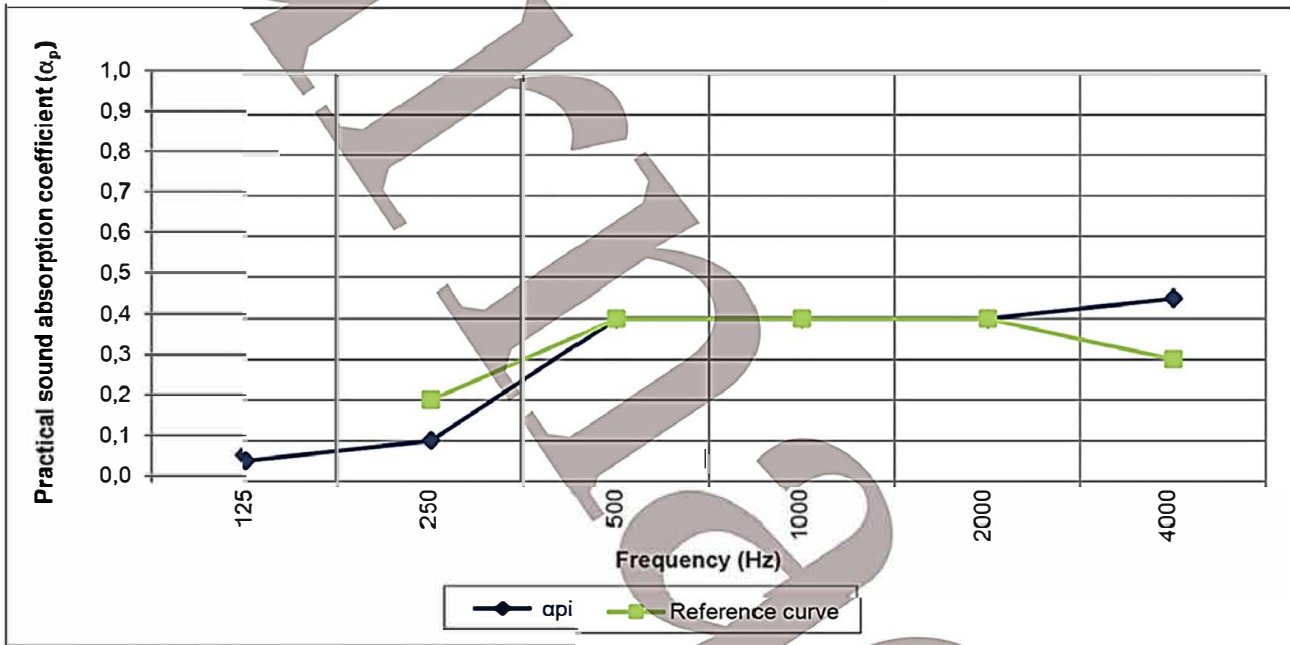
Observations:

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Practical sound absorption coefficient (α_{pi}) and adjusted reference curve

Freq. (Hz)	125	250	500	1000	2000	4000
Reference curve	—	0,20	0,40	0,40	0,40	0,30
α_{pi}	0,05	0,10	0,40	0,40	0,40	0,45

Graphical presentation of the practical sound absorption coefficient (α_{pi}) and the adjusted reference curve



Weighted sound absorption coefficient (α_w) determined in accordance with the EN ISO 11654:1997 (it is recommended the use of this global index together with the complete curve):

$$\alpha_w = 0,4$$

Class of sound absorption according to Annex B from EN ISO 11654:1997:

Class = D

Average sound absorption in accordance with the ASTM C423 - 17*:

$$SAA = 0,31$$

Report author

Technical responsibility

Administration

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Motivo: Direção

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