Test Report

Report nº: ACL 067/14 **Date:** 2014/04/16

Requested by:

Name: Vasco Emanuel, Lda.
Adress: Rua da Inacor, 327; 4536-909 Lourosa - Portugal
Contact: **Fax.:** --- **Phone:** +351 227 475 200 **e-mail:** vasco@muratto.com

Manufacturer and test specimen identification:

Name*: Vasco Emanuel, Lda.
Test specimen*: CORK BRICKS

Test data:

Test: Laboratory measurement of sound absorption (in a reverberation room) (Ref. ACL.02)
Date: 2014/04/14

Empty reverberation room:		Reverberation room with test specimen:	
Temperature (ºC):	17,9	Temperature (ºC):	18,2
Relative Humidity (%):	78,8	Relative Humidity (%):	80,1

Standard: NP EN ISO 354:2007
Operator(s): Ana Neves / José Nascimento **Report author(s):** José Nascimento / Paulo Amado Mendes

Test specimen description: **Area of the test specimen (m^2):** 11,2

Sample with our reference ACL088A/14, composed by natural cork pieces, pre-cleaned and naturally treated, with an immersion finishing of colored pigmentation and special wax, comprising a repeated pattern based on the juxtaposition of three individual pieces with dimensions of 300mm x 100mm x 7mm, 200mm x 100mm x 11mm and 100mm x 100mm x 14mm, respectively, which were disposed side by side over the reflector pavement of the reverberation room, corresponding to an assembly classified as type "A", in agreement with the standard NP EN ISO 354:2007. A peripheric frame was used along the outside perimeter of the test sample, formed by laminated gypsum boards with thickness of 12,5mm. The collocation of the sample in the reverberation room followed the indications of standard NP EN ISO 354:2007, defining a total area of 11,2m2.

Reverberation room description: **Volume of the reverberation room (m^3):** 204,0

The reverberation room has a rectangular shape, in plant, with approximatelly 5,85m x 5,85m and a ceiling height of 5,85m. 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.

Test equipment:

Acoustic chambers at ITeCons; "Bruel & Kjaer" Pulse multianalyser system, PUL02, model 3560-C-T46, with five acquisition channels; "Bruel & Kjaer" rotating microphone boom, type 3923, GIR01, with "Bruel & Kjaer" 1/2" microphone, type 4190, MIC06; sound level meter calibrator, type 4231, from "Bruel & Kjaer", CLS04; ominidirectional sound source OMNIPOWER 4292, from "Bruel & Kjaer", FSO04; termohygrometer THR09.

Additional information related with the test:

Number of microphone positions: 3 **Number of source positions:** 4
Number of decays per microphone/source combination: 3
Evaluation method of reverberation time: based on decay curves
Measurement in bands of: One-third-octave

Notes: The present report cannot be reproduced, except in full, without the written agreement of ITeCons.
The results are valid exclusively for the tested specimens.
Data reported with * supplied by customer.

ITeCons · Rua Pedro Hispano · Pólo II da Universidade de Coimbra · 3030-289 Coimbra
NIPC: 507 487 648 · T. +351 239 79 89 49 · F. +351 239 79 89 39 · www.itecons.uc.pt · e-mail: itecons@itecons.uc.pt

Picture of the test specimen:



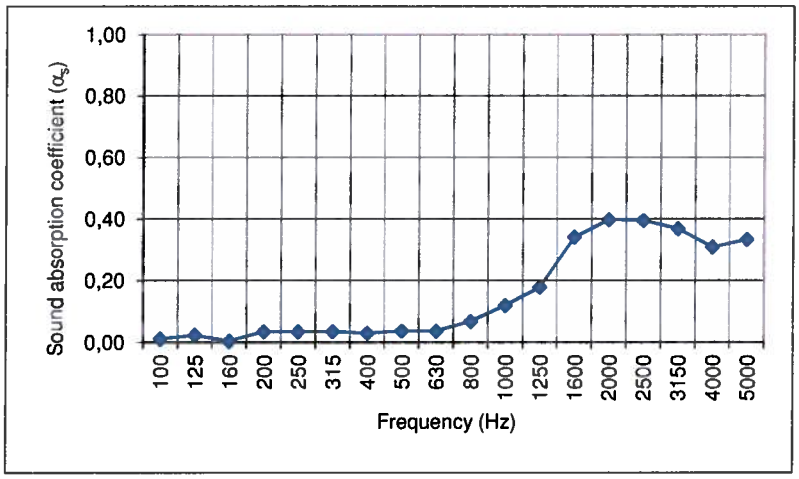
Average reverberation times (T1 - empty reverberation room; T2 - reverberation room with test specimen):

Freq. (Hz)	100	125	160	200	250	315	400	500	630
T1 (s)	17,65	10,86	8,70	9,00	7,86	7,53	8,54	9,44	9,02
T2 (s)	16,62	10,05	8,62	8,16	7,22	6,93	7,89	8,47	8,14
Freq. (Hz)	800	1000	1250	1600	2000	2500	3150	4000	5000
T1 (s)	8,58	8,06	7,46	6,51	5,63	4,50	3,93	3,40	2,75
T2 (s)	7,19	6,09	5,15	3,72	3,21	2,81	2,64	2,51	2,10

Sound absorption coefficient (α_S):

Freq. (Hz)	100	125	160	200	250	315	400	500	630
α_S	0,01	0,02	0,00	0,03	0,03	0,03	0,03	0,04	0,04
Freq. (Hz)	800	1000	1250	1600	2000	2500	3150	4000	5000
α_S	0,07	0,12	0,18	0,34	0,40	0,40	0,37	0,31	0,33

Graphical presentation of the sound absorption coefficient:



Remarks:

Weighted sound absorption coefficient α_w = 0,10 (H) determined in accordance with the EN ISO 11654:1997 (it is recommend the use of this global index together with the complete curve α_S), and not classified, according to Annex B of that standard. Noise Reduction Coefficient NRC = 0,15.

Technical responsibility

(Paulo Amado Mendes, Technical and Scientific Supervisor)

Administration

ITeCons Instituto de Investigação e Desenvolvimento Tecnológico em Ciências da Construção

ACL067/14

Notes: The present report cannot be reproduced, except in full, without the written agreement of ITeCons.
The results are valid exclusively for the tested specimens.

ITeCons Rua Pedro Hispano Pólo II da Universidade de Coimbra 3030-289 Coimbra
NIPC: 507 487 648 T. +351 239 79 89 49 F. +351 239 79 89 39 www.itecons.uc.pt e-mail: itecons@itecons.uc.pt