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.

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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:



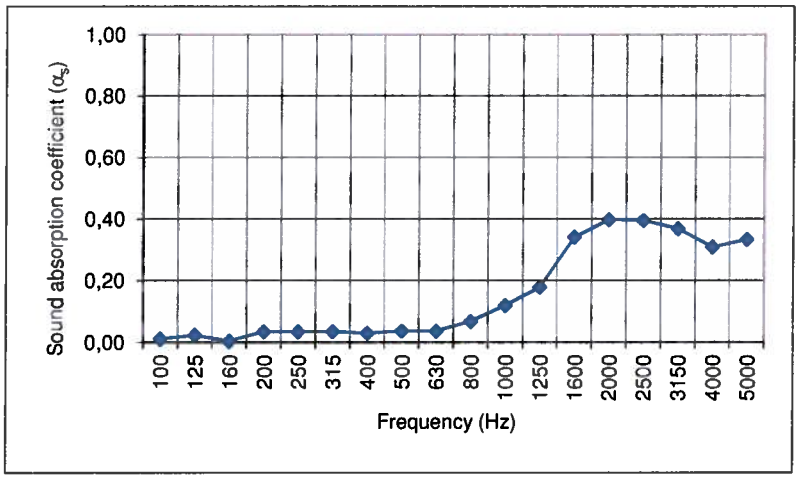
Average reverberation times (T1 - empty reverberation room; T2 - reverberation room with test specimen):

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

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Test Report

Report nº: ACL 068/14 **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*: ORGANIC BLOCKS

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):	18,5
Relative Humidity (%):	78,8	Relative Humidity (%):	79,8

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):** 11,0

Sample with our reference ACL089A/14, composed by massive cork pieces, molded in shape with your reference "MINICHOCK", with mass pigmentation and a special mass resin, comprising individual pieces with exterior dimensions of 250mm x 250mm and maximum thickness of 20mm, 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 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 11,0 m2.

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", FSO4; 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

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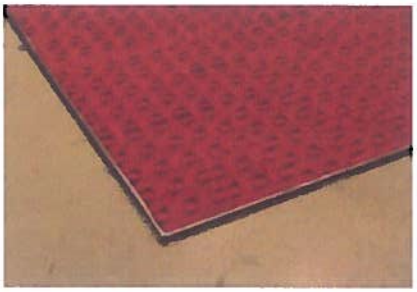
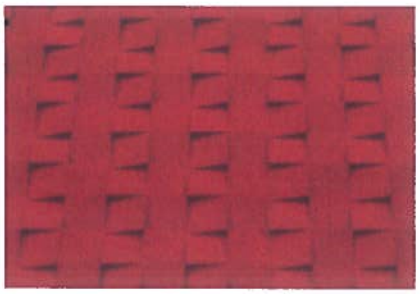
Picture of the test specimen:

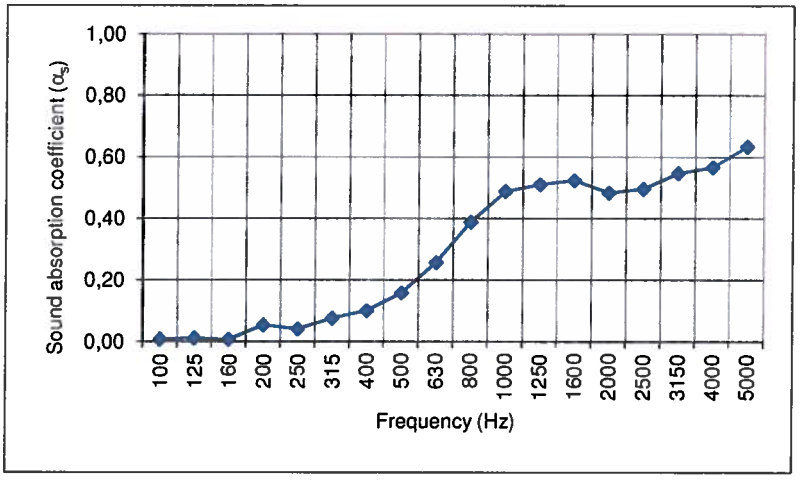
Average reverberation times (T1 - empty reverberation room; T2 - reverberation room with test specimen):

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)	16,92	10,44	8,54	7,75	7,10	6,32	6,63	6,29	5,08
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)	4,05	3,48	3,28	3,04	2,95	2,58	2,28	2,07	1,74

Sound absorption coefficient (α_S):

Freq. (Hz)	100	125	160	200	250	315	400	500	630
α_S	0,01	0,01	0,01	0,05	0,04	0,08	0,10	0,16	0,26
Freq. (Hz)	800	1000	1250	1600	2000	2500	3150	4000	5000
α_S	0,39	0,49	0,51	0,52	0,48	0,50	0,55	0,57	0,63

Graphical presentation of the sound absorption coefficient:



Remarks:

Weighted sound absorption coefficient α_w = 0,25 (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 class E of sound absorption, according to Annex B of that standard. Noise Reduction Coefficient NRC = 0,3.

Technical responsibility

(Paulo Amado Mendes, Technical and Scientific Supervisor)

Administration

ITeCons

ACL068/14

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Product (Cork Bricks-special size)

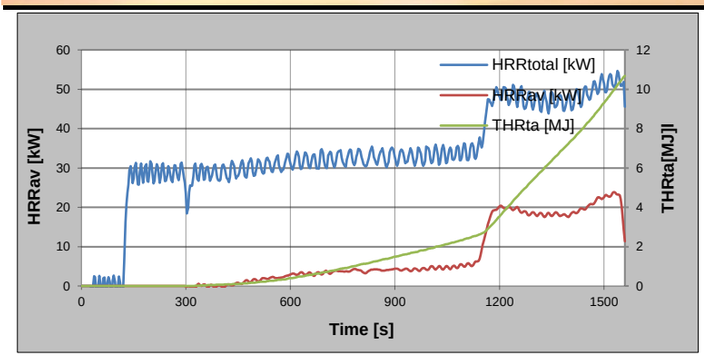
Product description: Natural cork pieces, pre-treated, in the dimensions of 250*70*10mm and 250*70*12mm, stabilized, and colored with special pigmentation in color selected by the client.

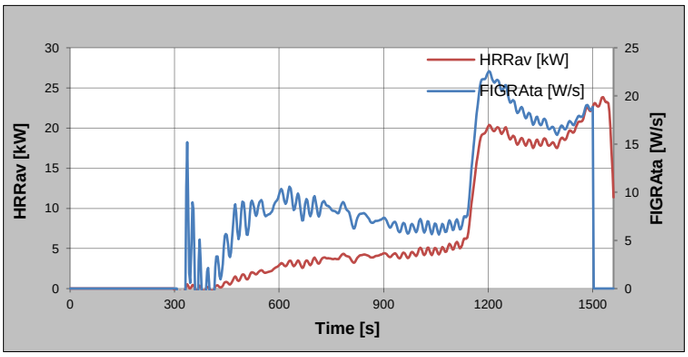
EN ISO 11654: NCR 0,15

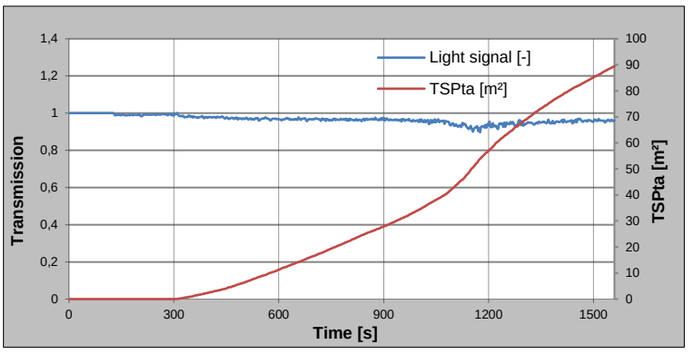
EN 12667 2001 : Volume mass (Kg/m3): 322
Thermal conductibility (W/(m.ºC)): 0,054
Thermal resistance: 0,46

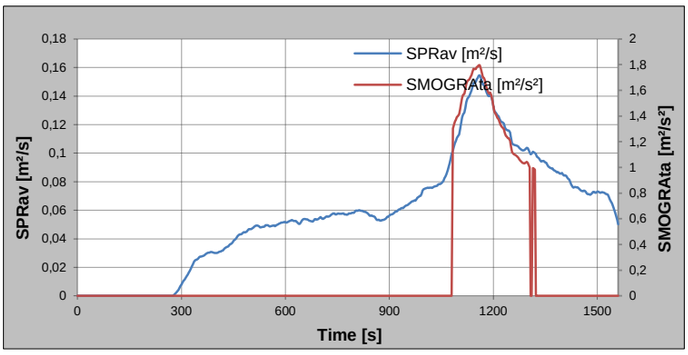
Image:

SBI Test Report - EN 13823









FIGRA_0.2 [W/s]	22,57		
FIGRA_0.4 [W/s]	22,57		
FIGRA [W/s]	22,57	B	B
THR600s [MJ]	1,49	B	
Heat Release			

SMOGRA [m²/s²]	1,80	S1
TSP600s [m²]	27,86	
Smoke Production		

Classification based on :

Classic Construction Product

Standard used	EN 13823:2010 + A1:2014
Date of test	26-04-2016
Full test duration/performed	Yes
Smoke correction performed	No
Report identification	OMC143A16
Product	
Product identification	organic Blocks
Sample number	1
Thickness [mm]	0
Mass per Area [kg/m²]	0
Test Conditions	
Conditioning respected	No
Mounting by	0
Substrate	0
Fixing	0
Orientation	0
Joints	
Trolley	
Laboratory	
Laboratory identification	ITeCons
Operator	Joana Faria
Filename	OMC143A16_1.xls
Specifications apparatus	
Flow profile kt	0,938728794
Probe constant krho	1,08
Duct diameter [m]	0,315
O_2 calibration delay time [s]	18
CO_2 calibration delay time [s]	15
Pre-test conditions	
Barometric pressure (Pa)	100620
Relative humidity (%)	57,9
Ambient temperature (°C)	20
Visual observations	
LFSedge	No
FDP (f =< 10s)	No
FDP (f > 10s)	No
End of test conditions	
Light transmission (%)	98,3
X O_2 (%)	20,84
X CO_2 (%)	0,120
Recorded events	
Surface flash	No
Falling of specimen parts	No
Droplets <10s	No
Droplets >10s	No
Smokes not entering hood	No
Mutual fixing of backing board fails	No
Conditions justify early stop of test	No
Tendency distortion/collapse	No
Excessive RHR	No
Excessive temperature	No

d0

Estimated Class:

B-S1,d0

TEST REPORT

Material: MURATTO - CORK BRICKS

Determination of Fire Reaction Class

Testing Methodology: The methodology used to carry out the tests was the standard constant EN ISO 11925:2010. The methodology followed for the classification of the material was the constant of the standard NP EN 13051-1:2007+A1 dated 2013.

Dimensions and Conditioning of test pieces

Before being tested, they were conditioned at the temperaturev of 23 ± 2ºC and relative humidity of 50 ± 5% for a minimum of 380 hours.

Tests Results

The material was tested with surface and on-board flame attack and the following results were obtained:

Flame Attack Position	Superficial

Exposure Time	30 sec.

Test Piece	40/LFF/13/01	40/LFF/13/02	40/LFF/13/03
Ignition Time (sec.)	3	4	3
Time to reach 150 mm (sec.)	Does not reach	Does not reach	Does not reach
Fs (mm)	48	46	51
Falling drops / particles	No	No	No
Paper Ignition	No	No	No

Exposure Time	30 sec.

Test Piece	40/LFF/13/04	40/LFF/13/05	40/LFF/13/06
Ignition Time (sec.)	2	2	2
Time to reach 150 mm (sec.)	Does not reach	Does not reach	Does not reach
Fs (mm)	43	41	47
Falling drops / particles	No	No	No
Paper Ignition	No	No	No

Conclusion

Considering all the tests obtained, it is possible to conclude that the material should be included in **class E**.

Porto, December 16, 2013

Technical Manager for the Lab:

Responsible for the tests

João Rodrigues

João Rodrigues

The test results relate to the behavior of the test pieces of a product according to standard test conditions; Should not be considered as the sole criterion for assessing the potential fire hazard. "

Technical datasheet for C05_PATTERN TILES

Product: Cork tiles in 500x500mm (Motif collection) or 200x200mm (Patchwork collection), cut in special designs, in 3,8mm thickness, with self-adhesive on the backing.

Composition/Layers

Layer 1: Waxed finished

Layer 2: Color pigments

Layer 3: Cork Sheet with granules of 0,5/1mm

TEST METHOD	PROPERTY	UNIT	VALUE
ISO 7322	Specific weight	Kg/m^3	170 - 240
ISO 7322	Tensile strength	kPa	≥ 400
ISO 7322	Compressibility	%	30 - 50
ISO 7322	Recovery	%	≥ 75
ISO 7322	Boiling water	-	No disaggregation

Layer 4: Recycle PU

TEST METHOD	PROPERTY	UNIT	VALUE
ASTM F 1315	Density	Kg/m^3	> 400
ASTM F36	Compressibility at 100 psi	%	20 - 40
ASTM F36	Recovery after100 psi	%	> 80
ASTM F152	Tensile Strength	MPa	>0.4

Layer 5: Acrylic double face adhesive with polyester multidirectional mesh

PROPIEDADES FÍSICAS

FUERZA ADHESIVA AFERA 5001 (N/25 mm):	**32**	**+-3**
ESPESOR (mm sin protector):	**0,1**	**+-7%**
RESISTENCIA A LA TEMPERATURA (°C):	**-30/+100**	

muratto®
cork wall coverings

TECHNICAL DATA

Colection	**C03_ORGANIC BLOCKS**
Product name	**(a)PEAK, (b)MINICHOCK, (c)CHOCK, (d)BEEHIVE, (e) SENSES**
Product code	**(a)MUOBPEA, (b)MUOBMIN, (c)MUOBCHO, (d)MUOBBEE, (e)MUOBSEN**
Composition	**Cork granulates, natural resins and color pigments**
Dimensions	**(a) 250mm*250mm*24mm; (b) 250mm*250mm*25mm; (c) 250mm*250mm*20mm; (d) 250mm*180mm*20mm; (e) 250mm*170mm*40mm;**
Dimensions under norm EN 427	**Lenght: +/- 0,5% ; Width: +/- 0,5 %**
Squareness under norm EN 427	**Lenght: <0,5mm ; Width: <0,5 mm**
Tickhness under norm ISO7322	**24mm +/- 0,8mm**
Density under norm EN672	**196 Kg m3**
Accoustics under EN ISSO 11654	**NRC(noise reduction coeficiente) = 0,3**
Thermal conductivity EN 1946 – (W/m.C)	**0,0468**
Thermal resistance EN12667	**0,0572 m2C/W**
Fire resistance EN13823	**D-s2 d0**

RELATÓRIO DE ENSAIO

Requerente: Vasco Emanuel, Lda.

Endereço: Rua Pedro Homem de Melo, 432 - 1º Esq.
4150-598 Porto

Pedido: Determinação da classe de reação ao fogo segundo as Euroclasses

Material: MURATTO - CORK BRICKS

Referência do pedido: Email

Data do pedido: 2013-11-20

Data de recepção do material: 2013-11-26

Data de realização dos ensaios: 2013-12-12

Relatório N.º: 40/LFF/13

Determinação da classe de reação ao fogo

1 - Objectivo

Os ensaios, a que se refere o presente relatório, dizem respeito à determinação da classe de reação ao fogo de placas de cortiça natural com tratamento anti-nódoas e anti-humidade, fabricadas pela empresa Vasco Emanuel, Lda. com a marca **MURATTO** e designação **CORK BRICKS**. O material em apreço destina-se a ser utilizado na indústria de construção civil.

2 - Metodologia dos ensaios

A metodologia seguida para a realização dos ensaios foi a constante da norma EN ISO 11925:2010. A metodologia seguida para a classificação do material foi a constante da norma NP EN 13051-1:2007+A1 datada de 2013.

3 - Dimensões e Condicionamento dos provetes

Antes de serem ensaiados foram condicionados à temperatura de 23 ± 2 °C e à humidade relativa de 50 ± 5 % durante um mínimo de 380 horas.

Os provetes foram preparados pelo requerente e tinham as seguintes dimensões:

Provete	Comprimento (mm)	Largura (mm)	Espessura (mm) (a)	Massa (g) (a)
40/LFF/13/01	251	91	14.96	266.5
40/LFF/13/02	251	91	14.77	273.2
40/LFF/13/03	251	91	14.71	269.9
40/LFF/13/04	251	90	14.60	275.0
40/LFF/13/05	251	91	14.58	280.0
40/LFF/13/06	251	90	14.79	276.6

(a) Incluiu suporte de fibrocimento de 6 ± 1 mm de espessura

4 – Resultados dos ensaios

O material foi ensaiado, com ataque de chama superficial e bordo tendo-se obtido os seguintes resultados:

Posição de Ataque Pela Chama	Superficial

Tempo de Exposição	30 s

Provete	40/LFF/13/01	40/LFF/13/02	40/LFF/13/03
Tempo de Ignição (s)	3	4	3
Tempo para atingir 150 mm (s)	Não Atinge	Não Atinge	Não Atinge
F_S (mm)	48	46	51
Queda de Gotas/Partículas	Não	Não	Não
Ignição do Papel	Não	Não	Não

Fs – Propagação Vertical da Chama

Posição de Ataque Pela Chama	Bordo

Tempo de Exposição	30 s

Provete	40/LFF/13/04	40/LFF/13/05	40/LFF/13/06
Tempo de Ignição (s)	2	2	2
Tempo para atingir 150 mm (s)	Não Atinge	Não Atinge	Não Atinge
F_S (mm)	43	41	47
Queda de Gotas/Partículas	Não	Não	Não
Ignição do Papel	Não	Não	Não

Fs – Propagação Vertical da Chama

5 – Conclusão

Face a totalidade dos ensaios obtidos é possível concluir que o material deve ser incluído na **classe E**.

Porto, 16 de Dezembro de 2013

Responsável pelos ensaios

João Rodrigues

Responsável Técnico do Laboratório

João Rodrigues

"Os resultados de ensaio relacionam-se com o comportamento dos provetes de um produto de acordo com condições normalizadas de teste; não devem ser considerados como o único critério para avaliar o potencial risco de incêndio."

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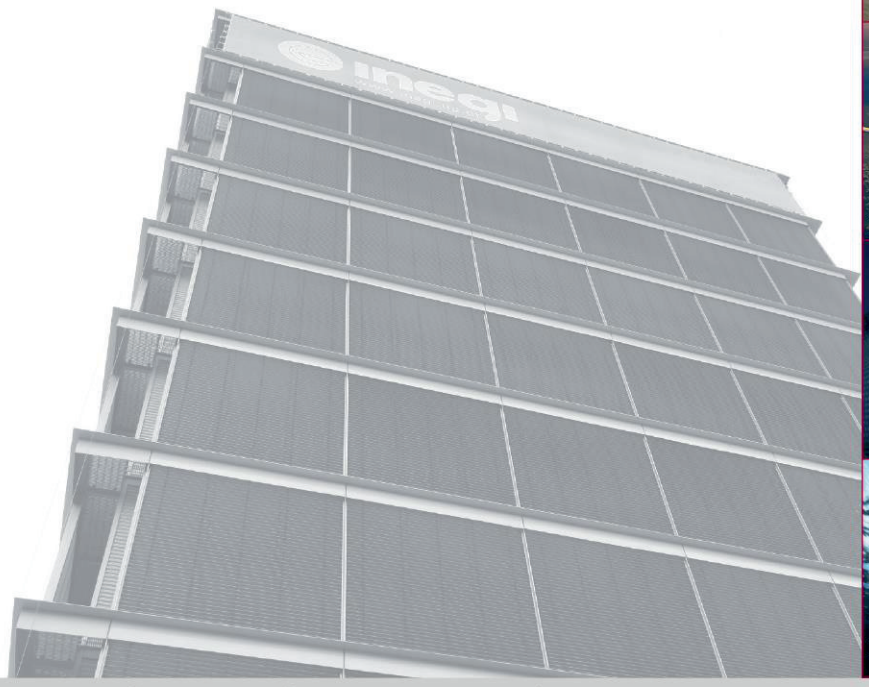


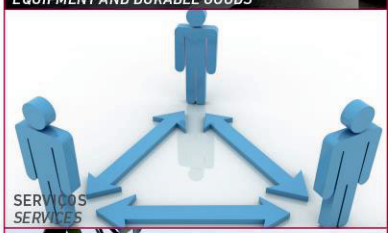
INSTITUTO DE CIÊNCIA E INOVAÇÃO EM ENGENHARIA MECÂNICA E ENGENHARIA INDUSTRIAL

IPAC acreditação L0715 Ensaios

ilac-MRA

O IPAC é um dos signatários do Acordo de Reconhecimento Mútuo da EA (*European Co-operation for Accreditation*) e do ILAC (*International Laboratory Accreditation Cooperation*) para ensaios.

LABORATÓRIO DA
QUALIDADE DO AR INTERIOR



Determination of VOC emissions, formaldehyde, acetaldehyde and other CMRsubstances from building products (French Legislation)

MURATTO

Process: LQAI.MC69/17
Identification of the Material: ORGANIC BLOCKS

U.PORTO

0 Documental Control

0.1 Identification of Document

Project	---
Name of Document	Determination of VOC emissions, formaldehyde, acetaldehyde and other CMR substances from building products (French Legislation)
Name of file	---

0.2 Control of versions

Version	Edition	Revision	Date	Description	Approved by
1	1	0	2018-01-16	Original version	GV

0.3 Author(s)

Name	Initials
Gabriela Ventura / Responsável Técnico do Laboratório	GV

0.4 Reviser(s)

Name	Initials
Susana Martins / Técnico de Laboratório Coordenador	SM

0.5 List of distribution

Name	Initials	Entity
Laboratório da Qualidade do Ar Interior	LQAI	INEGI
---	---	CORKSRIBAS

INEGI – Instituto de Ciência e Inovação em Engenharia Mecânica e Engenharia Industrial

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TABLE OF CONTENTS

1. Objective 5
2. Client 5
3. Methodologies used 6
4. Results 8
5. Discussion of the results 9
6. References 9

1. Objective

Determination of emitted volatile organic compounds, formaldehyde, acetaldehyde and some CMR substances (carcinogenic, mutagenic and reprotoxic) intending the material classification according to the criteria established by the French legislation.

2. Client

Muratto
Rua Pedro Homem de Melo, nº242
4150-598, Porto
Portugal

3. Methodologies used

The study was conducted on a sample of building product, designated as "ORGANIC BLOCKS". The sample was delivered at LQAI on 2017/11/23. The selection of the product sample was the sole responsibility of the client.

The test in the test chamber started on 2017/11/29 and was performed according to the internal proceeding IT.403 (based on ISO 16000-9[1]). This test is accredited in accordance with EN ISO / IEC 17025[2] for the compounds:

Test	Method
Determination of Benzene - method of emission in test chamber	IT.403.04
Determination of Toluene - method of emission in test chamber	IT.403.04
Determination of Ethylbenzene - method of emission in test chamber	IT.403.04

Note: IT.nnn.nn indicates internal laboratory procedure

It should be noted that the remaining compounds determined in this test and are out the scope of Accreditation, are determined using the same quality standards that apply to them.

The VOCs samples were collected, in tubes with Tenax TA, when the test chamber was empty (2017/11/29, volume: 5.19 l) and in duplicate after 28 days (2017/12/27, average volume: 6.21 l) after starting the test.

Formaldehyde and acetaldehyde were collected in cartridges impregnated with DNPH when the test chamber was empty (2017/11/29, volume: 85.6 l) and after 28 days (2017/12/27 , volume: 88.2 l) after starting the test.

The experimental conditions in the chamber during the study were:

Period	T (ºC)	HR (%)	v (m/s)	n (h^{-1})	A/V (m^2/m^3)
Test (28 days)	23.4±0.3	48.9±2.0	0.10	0.52	1.06

where *T* is the temperature, *HR* the relative humidity, *v* the air velocity at the surface of the material, *n* the air exchange rate and *A/V* the ratio of sample area to chamber volume (loading factor). The volume of the chamber used is 0.255 m^3.

For the analysis, thermal desorption on line with gas chromatography coupled to a mass spectrometer detector for VOC identification and quantification (GC/MSD) was used. The GC used is from Agilent Technologies, model 6890N and the mass spectrometer detector is from Agilent also, model 5973. The thermal desorption system is from DANI, model STD 33.50. The analysis was conducted on 2017/12/27 according to the internal proceeding IT.401 (based on ISO 16000-6[3]). This test is accredited in accordance with EN ISO / IEC 17025[2] for the compounds:

Test	Method	Uncertainty
Determination of Benzene by thermal desorption and Gas chromatography with mass selective detector	IT.401.02	6.2
Determination of Toluene by thermal desorption and Gas chromatography with mass selective detector	IT.401.02	5.8
Determination of Ethylbenzene by thermal desorption and Gas chromatography with mass selective detector	IT.401.02	4.6
Determination of 1,2,4-trimethylbenzene by thermal desorption and Gas chromatography with mass selective detector	IT.401.02	5.0

Nota: IT.nnn.nn indicates internal laboratory procedure.

It should be noted that the remaining compounds determined in this test which are not covered by the accreditation are determined using the same quality standards as applied to them. The emission factors of the identified compounds were determined using the specific response factor. Total volatile organic compounds (TVOC) concentration was calculated for all compounds eluted between hexane and hexadecane, using the toluene response factor.

Formaldehyde and acetaldehyde were determined according to the internal proceeding IT.402 (based on ISO 16000-3[4]). Specifically, the compounds were analysed by high performance liquid chromatography (HPLC) using a gas chromatograph Agilent Technologies brand, model 1220 Infinity LC. The emission factor of the compounds was calculated based on the specific response factor of the analytical method. The analysis took place on 2017/11/30 and 2017/12/28. The uncertainty of the analytical method for formaldehyde is ± 12.8%. and for acetaldehyde is ± 12.0%. This analysis is out the scope of accreditation.

4. Results

Table 1 shows the concentrations of substances or groups of substances, obtained for a specific ventilation rate of 0.50 $m^3h^{-1}m^{-2}$, as well as the concentration limits ($\mu g/m^3$) for different classes established by the French legislation[5].

Table 2 lists the concentration limits ($\mu g/m^3$) for CMR substances, imposed by the French legislation[6] and the observed values for the material under study to a specific ventilation rate of 0.50 $m^3h^{-1}m^{-2}$.

Table 1. Limit values established by the French legislation and concentrations observed for the material after 28 days of exposure for a specific ventilation rate of 0.50 $m^3h^{-1}m^{-2}$.

		Concentration ($\mu g/m^3$)				
		Classes				MC69/17
Compound	CAS	C	B	A	A+	28 days
Formaldehyde+	50-00-0	>120	<120	<60	<10	< 1.3*
Acetaldehyde+	75-07-0	>400	<400	<300	<200	< 2.45*
Toluene	108-88-3	>600	<600	<450	<300	< 0.4*
Tetrachloroethylene+	127-18-4	>500	<500	<350	<250	< 1.8*
Xylene+	1330-20-7	>400	<400	<300	<200	< 0.5*
1,2,4-trimethylbenzene	95-63-6	>2000	<2000	<1500	<1000	< 0.6*
1,4-dichlorobenzene+	106-46-7	>120	<120	<90	<60	< 0.4*T
Ethylbenzene	100-41-4	>1500	<1500	<1000	<750	< 0.4*
2-butoxyethanol+	111-76-2	>2000	<2000	<1500	<1000	< 1.0*
Styrene+	100-42-5	>500	<500	<350	<250	< 0.3*
TVOC		>2000	<2000	<1500	<1000	1203

* LOD – Limit of Detection
** LOQ – Limit of Quantification
*T Limit of detection calculated for toluene.
+ Out of the scope of accreditation.

Table 2. Limit values established by the French legislation and concentrations observed for the material after 28 days of exposure for a specific ventilation rate of 0.50 $m^3h^{-1}m^{-2}$.

		Concentration ($\mu g/m^3$)	
Compound	CAS	Limit	MC69/17 28 days
Trichloroethylene+	79-01-6	< 1 $\mu g/m^3$	n.d.
Benzene	71-43-2	< 1 $\mu g/m^3$	n.d.*
Bis(2-ethylhexyl) phthalate+	117-81-7	< 1 $\mu g/m^3$	n.d.**
Dibutyl phthalate (DBP)+	84-74-2	< 1 $\mu g/m^3$	n.d.

n.d. – not detected, which means lower than the limit of detection.
* Limit of Detection for benzene = 0.39 $\mu g/m^3$.
** Although it has not been evaluated analytically it is considered that this compound is not present in the emissions of the material under study, as stated by the manufacturer in the attached declaration
+ Out of the scope of accreditation.

5. Discussion of the results

The results presented in Table 1 and 2 shows that the material ê ORGANIC BLOCK ê is rated ***A*** according to the French regulations and meets the criteria established by legislation.

6. References

1.- ISO 16000-9 (2006). Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method.

2.- NP EN ISO/IEC 17025:2005 Requisitos gerais de competência para laboratórios de ensaio e calibração.

3.- ISO 16000-6 (2011). Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS/FID.

4.- ISO 16000-3 (2011). Determination of formaldehyde and other carbonyl compounds Active sampling method.

5.- BssÁuÊ!ev!2:!bwsjm!3122!sfmbujg!›!mèÊujrvfubhf!eft!qspevjut!ef!dpotusvdujpo!pv!ef!sfwÁufnfou!ef! mur ou de sol et des peintures et vernis sur leurs émissions de polluants volatils.

6.- Arrêté du 30 avril 2009 relatif aux conditions de mise sur le marché des produits de construction et de décoration contenant des substances cancérigènes, mutagènes ou reprotoxiques de catégorie 1 ou 2.

Porto, 16 January 2018

Gabriela Ventura Alves da Silva

(Head of Laboratory)

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U.PORTO

Relatório de Ensaio

Relatório nº OMH 073/14 **Data:** 09-05-2014

Requerente: Vasco Emanuel, Lda
Endereço: Rua da Inacor, 327, 4536-909 Lourosa
Contacto: Vasco Barros
Fax. --- **Tel.** 227 475 200 **e-mail:** vasco@muratto.com

Determinação do coeficiente de condutibilidade térmica de produtos de isolamento térmico

Equipamento: HFM 436/3/1 *Lambda* (EN 1946-1:1999), NETZSCH
Configuração do equipamento: Pratos horizontais, prato quente no topo.
Método: Heat Flow Meter (ISO 8301:1991)

Designação do produto*: Cork Bricks
Descrição do material*: ---
Especificação: ---
Origem da amostra*: Vasco Emanuel, Lda
Ref.ª da amostra (requerente)*: ---
Espessura nominal*: 25 mm
Data de recepção da amostra: 30-Abr-14

Data de início do ensaio: 30-Abr-14
Data de fim do ensaio: 7-Mai-14
Ensaios realizados por: Saúl Martins
Temperatura ambiente: 22.4 °C
Humidade relativa do ambiente: 49.5 %

Norma de ensaio: *EN 12667:2001 - Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance*

Condicionamento do(s) provete(s): >24 horas a (23±2)°C, (50±5)%HR

Resultados do ensaio:

Referência provete	OMH222A/14	---	---	---	---
Referência provete (requerente)	1	---	---	---	---
Espessura (mm)	24,87	---	---	---	---
Área (m^2)	0,0891	---	---	---	---
Massa após condicionamento (g)	714,03	---	---	---	---
Variação de massa no condicionamento (%)	2,23	---	---	---	---
Variação de massa após o ensaio (%)	0,00	---	---	---	---
Temperatura média do ensaio (°C)	10,0	---	---	---	---
Diferença de temperatura entre pratos (°C)	20,0	---	---	---	---

Resultados						Média
Massa volúmica aparente** (Kg/m^3)	322,2	---	---	---	---	322,2
Condutibilidade Térmica [W/(m.°C)]	0,0541	---	---	---	---	0,0541
Resistência Térmica (m^2.°C/W)	0,46	---	---	---	---	0,46

(**após o condicionamento)

Observações: A recolha dos provetes foi efectuada pelo requerente.
O ensaio foi realizado com a sobreposição de duas placas de Cork Bricks. Não se cumpriram os critérios de planeza e paralelismo.

Notas: 1. Os resultados apresentados referem-se, exclusivamente, aos provetes ensaiados.
2. O equipamento NETZSCH HFM 436/3/1 Lambda é verificado bimestralmente por técnicos do ITeCons para as temperaturas médias de 10°C e 24°C. Material de referência:1450C677, certificado pelo National Institute of Standards & Technology (NIST) com o número MD 20899 a 04-07-2010 com uma condutibilidade térmica para a temperatura média de 10°C de 0,0321 W/(m.°C). A calibração expira a 30-07-2014.
3. Os dados assinalados com * foram fornecidos pelo cliente.
4. O presente relatório não pode ser reproduzido, excepto na íntegra, sem o acordo escrito do ITeCons.

Autoria Técnica: Saúl Martins

Responsável Técnico: Nuno Simões
(Nuno Simões, Supervisor Técnico e Científico)

Direcção: António Andreu

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Relatório de Ensaio

Relatório nº OMH 074/14 **Data:** 09-05-2014

Requerente: Vasco Emanuel, Lda
Endereço: Rua da Inacor, 327, 4536-909 Lourosa
Contacto: Vasco Barros
Fax. --- **Tel.** 227 475 200 **e-mail:** vasco@muratto.com

Determinação do coeficiente de condutibilidade térmica de produtos de isolamento térmico

Equipamento: HFM 436/3/1 *Lambda* (EN 1946-1:1999), NETZSCH
Configuração do equipamento: Pratos horizontais, prato quente no topo.
Método: Heat Flow Meter (ISO 8301:1991)

Designação do produto*: Organic Blocks
Descrição do material*: ---
Especificação: ---
Origem da amostra*: Vasco Emanuel, Lda
Ref.ª da amostra (requerente)*: ---
Espessura nominal*: 20 mm
Data de recepção da amostra: 30-Abr-14

Data de início do ensaio: 30-Abr-14
Data de fim do ensaio: 7-Mai-14
Ensaios realizados por: Saúl Martins
Temperatura ambiente: 23.8 °C
Humidade relativa do ambiente: 50,3 %

Norma de ensaio: *EN 12667:2001 - Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance*

Condicionamento do(s) provete(s): >24 horas a (23±2)°C, (50±5)%HR

Resultados do ensaio:

Referência provete	OMH225A/14	---	---	---	---
Referência provete (requerente)	1	---	---	---	---
Espessura (mm)	22,02	---	---	---	---
Área (m^2)	0,0617	---	---	---	---
Massa após condicionamento (g)	266,36	---	---	---	---
Variação de massa no condicionamento (%)	-0,02	---	---	---	---
Variação de massa após o ensaio (%)	0,09	---	---	---	---
Temperatura média do ensaio (°C)	10,0	---	---	---	---
Diferença de temperatura entre pratos (°C)	20,0	---	---	---	---

Resultados						Média
Massa volúmica aparente** (Kg/m^3)	196,1	---	---	---	---	196,1
Condutibilidade Térmica [W/(m.°C)]	0,0468	---	---	---	---	0,0468
Resistência Térmica (m^2.°C/W)	0,47	---	---	---	---	0,47

(**após o condicionamento)

Observações: A recolha dos provetes foi efectuada pelo requerente.
Não se cumpriram os critérios de planeza das superficies e das dimensões do provete a ensaiar.

Notas: 1. Os resultados apresentados referem-se, exclusivamente, aos provetes ensaiados.
2. O equipamento NETZSCH HFM 436/3/1 Lambda é verificado bimestralmente por técnicos do ITeCons para as temperaturas médias de 10ºC e 24ºC. Material de referência:1450C677, certificado pelo National Institute of Standards & Technology (NIST) com o número MD 20899 a 04-07-2010 com uma condutibilidade térmica para a temperatura média de 10ºC de 0,0321 W/(m.ºC). A calibração expira a 30-07-2014.
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