

**Research Center for Wooden Packaging and Logistic**

Sede Legale: Piazzale delle Rose, 1 - 46019 Viadana (MN) - Codice Fiscale, Partita IVA, N° iscr. Registro Imprese Mantova 01625120207 - Cap. Soc. euro 160.000,00 i.v. - Numero REA 170939 - Tel. +39 0375 780694 - Fax +39 0375 845300 - Web: www.cril.it - Email: info@cril.it

Report Number 10/19F
Repeat testing of blocks made of wood-chip material
according to UIC Code 435-2, appendix C

Customer:	Ecobloks srl Via Natalia Ginzburg, 20 41123 Modena (MO) Italy
Phone:	+39 059 5967877
Fax:	+39 059 236776
Email:	C.Bassi@Ecobloks.it
Samples:	Wood-chip material blocks
Nominal dimensions:	145x145x78 (H) mm
Receipt of the samples:	04th Feb. 2019
Sampling procedure:	on site by CRIL (01st Feb. 2019)
Number of samples received:	50 pieces
Test period:	from 14th Feb. to 18th Mar. 2019
Report issue date:	26th Mar. 2019
Number of pages:	8
Samples code:	10/19F
Report number:	10/19F
Viadana, li:	26th Mar. 2019

Main tests:	PASSED
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The tests results are referred exclusively to the tried samples.
The report cannot be reproduced, also partially, without the written consensus of the CRIL.



Boiling Test

References		Customer	
Report number	10/19F	Ecobloks srl	
Reference norm	UIC Code 435-2, appendix C, point 2.1	Via Natalia Ginzburg, 20 41123 Modena (MO) Italy	
Test period	28th Feb. 2019	Phone	+39 059 5967877
Average Temperature	22,9 ° C	Fax	+39 059 236776
		Email	C.Bassi@Ecobloks.it

SAMPLE	Wood-chip material blocks
Nominal dimensions	145x145x78 (H) mm

TEST RESULTS	
Sample N°	Observations
21	Homogeneous swelling, small cracks on two sides.
22	Asymmetric swelling, no noticeable cracks.
32	Homogeneous swelling, no noticeable cracks.
40	Asymmetric swelling, no noticeable cracks.
46	Homogeneous swelling, no noticeable cracks.

Pictures of boiling test



NOTE:
Checked manufacturer's monitoring documents. Esit: Positive.



Density test

References		Customer	
Report number	10/19F	Ecobloks srl	
Reference norm	UIC Code 435-2, appendix C, point 2.2 + EN 323	Via Natalia Ginzburg, 20 41123 Modena (MO)	
Test period	14th Feb. 2019	Italy	
Average Temperature	21,8 ° C	Phone	+39 059 5967877
Average Relative Humidity	22,1 %	Fax	+39 059 236776
		Email	C.Bassi@Ecobloks.it

SAMPLE	Wood-chip material blocks
Nominal dimensions	145x145x78 (H) mm

Measurements						
Sample N°	Average Length [mm]	Average Width [mm]	Average Height [mm]	Volume [mm ³]	Weight [g]	Density [kg/m ³]
04	142,61	142,77	78,73	1468233	1100,82	750
06	142,66	142,73	78,55	1460598	1015,2	695
7	142,45	142,63	78,82	1461019	1020,34	698
14	142,80	142,84	78,13	1448290	944,98	652
19	142,81	142,71	77,72	1430661	949,03	663
29	142,52	142,46	78,58	1449816	1038,7	716
34	142,76	142,75	78,58	1458788	1033,21	708
36	142,45	142,52	78,62	1446964	1037,25	717
43	142,66	142,70	78,48	1453886	1005,09	691
50	142,76	142,86	78,90	1469386	986,18	671
Average	142,65	142,70	78,51	1454764	1013	696

Minimum specifications		Result
Length:	minimum 142 mm, maximum 150 mm	Passed
Width:	minimum 142 mm, maximum 150 mm	Passed
Height	minimum 77 mm, maximum 79 mm	Passed
Density	minimum 600 kg/m ³ , maximum 750 kg/m ³	Passed

NOTE:
Checked manufacturer's monitoring documents. Esit: Positive.



Swelling test

References		Customer	
Report number	10/19F	Ecobloks srl	
Reference norm	UIC Code 435-2, appendix C, point 2.3 + EN 317	Via Natalia Ginzburg, 20 41123 Modena (MO)	
Test period	14th-15th Feb. 2019	Italy	
Average Temperature	21,2 ° C	Phone	+39 059 5967877
Average Relative Humidity	24,3 %	Fax	+39 059 236776
		Email	C.Bassi@Ecobloks.it

SAMPLE	Wood-chip material blocks
Nominal dimensions	145x145x78 (H) mm

Measurements					
Sample N°	Length increase [mm]	Length increase [%]	Width increase [mm]	Width increase [%]	Final height [mm]
04	0,69	0,49%	0,76	0,53%	81,79
06	1,61	1,13%	1,19	0,84%	81,77
7	1,10	0,78%	0,66	0,46%	80,71
14	1,39	0,98%	1,16	0,81%	80,34
19	1,24	0,87%	1,92	1,35%	81,31
29	0,89	0,62%	1,40	0,98%	81,54
34	0,28	0,20%	0,50	0,35%	80,80
36	1,07	0,75%	1,04	0,73%	81,87
43	0,98	0,68%	1,02	0,71%	81,10
50	0,74	0,52%	0,69	0,49%	80,43
Average	1,00	0,70%	1,04	0,73%	81,17

Swelling Limits		Result
Length increase:	maximum 2 %	Passed
Width increase:	maximum 2 %	Passed
Maximum Height	83 mm	Passed

NOTE:

Checked manufacturer's monitoring documents. Esit: Positive.



Transverse tensile test

References		Customer	
Report number	10/19F	Ecobloks srl	
Reference norm	UIC Code 435-2, appendix C, point 2.4 + EN 1087-1	Via Natalia Ginzburg, 20 41123 Modena (MO)	
Test period	18th Mar. 2019	Italy	
Average Temperature	18,9 ° C	Phone	+39 059 5967877
Average Relative Humidity	39,5 %	Fax	+39 059 236776
Apparatus of test	Electronic dinamometer	Email	C.Bassi@Ecobloks.it
Apparatus relative resolution	≤ 0,5 %		
Separation speed	10 mm/min		

SAMPLE	Wood-chip material blocks	
Nominal dimensions	145x145x78 (H) mm	

Tensile tests results		
Sample N°	Tensile strength [daN]	Test schema
1	77,9	
2	59,7	
3	67,1	
4	60,3	
5	64,3	
6	94,1	
7	80,4	
8	63,8	
9	62,6	
10	74,6	
Max value [daN]	94	
Min value [daN]	60	

		reference
Average strength [daN]	70,5	≥ 62,5*
Values up or equal to 62,5* daN	80%	≥ 80%

* Limit is 0,25 N/mm², area is 50x50mm=2500 mm²



Nail removal test

References		Customer	
Report number	10/19F	Ecobloks srl	
Reference norm	UIC Code 435-2, appendix C, point 2.5	Via Natalia Ginzburg, 20 41123 Modena (MO) Italy	
Test period	04th Mar. 2019	Phone	+39 059 5967877
Average Temperature	22,6 ° C	Fax	+39 059 236776
Apparatus of test	Electronic dinamometer	Email	C.Bassi@Ecobloks.it
Apparatus relative resolution	≤ 0,5 %		
Separation speed	10 mm/min		

SAMPLE	Wood-chip material blocks	
Nominal dimensions	145x145x78 (H) mm	

Nail removal tests results		
Sample N°	Max strength [daN]	Drawing of the segment
1	482	<p align="center">Block / Bottomdeck board assembly</p>
2	555	
3	565	
4	584	
5	548	
6	557	
7	561	
8	603	
9	561	
10	592	

EPAL CODE NAILS	PJ
Number of nails	3
Max residual moisture content	19,8%
Boards wood species	Spruce

Max value [daN]	603
Min value [daN]	482

		reference	
Average strength [daN]	565	≥ 550	(minimum and maximum values are not taken into account)

Values up or equal to 550 daN	80%	≥ 80%
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Heavy metal analysis

References		Customer	
Report number	10/19F	Ecobloks srl	
Reference norm	UIC Code 435-2, appendix C, point 2.6	Via Natalia Ginzburg, 20 41123 Modena (MO) Italy	
Test period	14th Feb. 2019	Phone	+39 059 5967877
Test Method	EPA 3051A: 2007+ EPA 6010C : 2007	Fax	+39 059 236776
Apparatus of test	ICP-AES	Email	C.Bassi@Ecobloks.it
Technology of test	Atomic Emission		

SAMPLE	Wood-chip material blocks	
Nominal dimensions	145x145x78 (H) mm	

Heavy metal analysis results	
Sample N°	Content [mg/kg]
Cadmium	0,6
Lead	53
Mercury	< 2
Chromium	8

Total Content [mg/kg]	63,6	reference
		< 100



Formaldehyde test

References		Customer	
Report number	10/19F	Ecobloks srl	
Reference norm	UIC Code 435-2, appendix C, point 2.6 + EN717-1	Via Natalia Ginzburg, 20 41123 Modena (MO)	
Test period	06th Feb. - 05th Mar. 2019	Italy	
Formaldehyde entrusted to	LAPI SPA	Phone	+39 059 5967877
		Fax	+39 059 236776
		Email	C.Bassi@Ecobloks.it



Rapporto di Prova / Test Report
no. 232.1UN0080/19 del / of 05/03/2019



LAB N° 0088

Tipo di spedizione / Manner of shipment

A cura del Richiedente
By the Sponsor

Nota / Note

Su domanda del Richiedente e secondo quanto riportato nel documento "Draft new issue UIC leaflet 435-2ff, Appendix C - Approval of blocks made of wood-chip material" punto 2.5:

- 1) I campioni sono stati pre-condizionati per 10 giorni a $(20 \pm 2)^{\circ}\text{C}$ e $(50 \pm 5)\%$ UR prima dell'inizio della prova
- 2) il fattore di carico è $0.3 \text{ m}^2/\text{m}^3$

On demand by the Sponsor and according to the document "Draft new issue UIC leaflet 435-2ff, Appendix C - Approval of blocks made of wood-chip material" point 2.5:

- 1) The specimens have been pre-conditioned for 10 days at $(20 \pm 2)^{\circ}\text{C}$ and $(50 \pm 5)\%$ RH before the beginning of the test.
- 2) The loading factor values is $0.3 \text{ m}^2/\text{m}^3$

Tempo per raggiungimento del valore di stato stazionario

Time to establish the steady state emission value

312 h

Tipo di camera / Chamber type

0.250 m^3

Descrizione sommaria delle condizioni di prova / Short description of test conditions

Camera operata a / Chamber operated at

$(23 \pm 0.5)^{\circ}\text{C} - (45 \pm 3)\%$ UR / RH

Fattore di carico / Loading ratio

$0.3 \text{ m}^2/\text{m}^3$

Ricambi aria / Air exchange rate

$(1.0 \pm 0.05)/\text{h}$

Velocità aria alla superficie dei provini / Air speed at specimen surface

0.18 m/s

Procedura analitica impiegata / Analytical procedure used

Acetilacetone / Acetylacetone

RISULTATI / RESULTS

Valore di emissione di formaldeide allo stato stazionario	0.0992	mg/m ³
Steady state emission value of formaldehyde	0.08	ppm

LUOGO E DATA FINE PROVA: Prato, 04/03/2019
Place and date of test end

Operatore / Operator
Dr. Luca Ermini



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Il presente Rapporto di Prova non può essere riprodotto in forma parziale senza l'autorizzazione scritta di questo Laboratorio