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TESTING LABORATORY OF WOOD, WOOD-BASED MATERIALS, PACKAGING, FURNITURE, CONSTRUCTIONS AND WOODWORKING MACHINES

PHYSICAL AND MECHANICAL TESTING SECTION AND CHEMICAL TESTING SECTION

Poznań, 17.04.2020

TEST REPORT *No A943/2020/S.B+S.C*

Subject of the order:

First six-month testing of blocks made of wood-chip material for use in pallets acc. to the EPAL requirements

Order No: **A-943-BDZ/2020**

Name and address of the Customer:

BALTIC BLOCK SIA
1 Karla Street, LV-4853 Sauleskalns, Berzaunes pagasts, Latvia

Performance date:

28.02.2020 – 7.04.2020

Operators:

First name and surname	Signature
Karolina Mytko	K. Mytko
Maciej Bendowski	Bendowski

Authorising

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1 IDENTIFICATION (TESTING OBJECTS DESCRIPTION)

The subject of the test were blocks made of wood-chip material manufactured by the Customer in the I quarter of 2020:

A – 45 blocks of nominal dimensions 145mm×145mm×78mm,

B – 45 blocks of nominal dimensions 145mm×100mm×78mm.

2 SAMPLING DATE AND PLACE

Blocks were collected at place of production on 7.02.2020.

3 SCOPE AND METHODS OF EXAMINATION

Tested feature	Test method
Moisture content	EN 322:1993
Quality of bonding	EN 13698-1:2003 Annex A
Density, height, width and length	EN 323:1993 and EN 13698-1:2003
Swelling in height Swelling in width Swelling in length	EN 317:1993 and EN 13698-1:2003
Tensile strength after boiling test	EN 1087-1:1995 and EN 319:1993
Extraction force	EN 13698-1:2003 Annex D
Formaldehyde content – extraction method called the perforator method	EN ISO 12460-5:2015 (previously EN 120)

4 APPARATUS

To carry out the tests the following measuring instruments were used:

- strength testing machine, identification No B1/15,
- electronic calliper, identification No B12/102,
- electronic calliper, identification No B12/103,
- electronic sensor, identification No B24/111,
- laboratory electronic scales, identification No B9/02,
- laboratory electronic scales, identification No C2/01,
- spectrophotometer, identification No C8/02.

5 TEST RESULTS

5.1 Moisture content

On the day of delivery of the blocks to the Laboratory their moisture content was tested by oven-dry method.

Table 1

Nominal dimensions of blocks: 145mm×145mm×78mm				
Sample No	1	2	3	Mean value
Mass (wet) [g]	1110	1094	1095	
Mass (dry) [g]	1007	997	992	
Moisture content [%]	10.2	9.8	10.3	**10.1**

Table 2

Nominal dimensions of blocks: 145mm×100mm×78mm				
Sample No	1	2	3	Mean value
Mass (wet) [g]	792	788	780	
Mass (dry) [g]	718	715	706	
Moisture content [%]	10.4	10.1	10.5	**10.3**

5.2 Dimensions and density

Table 3

Nominal dimensions of blocks: 145mm×145mm×78mm										
	Sample No									
Feature	1	2	3	4	5	6	7	8	9	10
Mass [g]	1141	1027	1151	1093	1095	1150	1116	1091	1090	1133
Diagonal [mm]	179.6	179.2	180.1	180.9	179.9	179.4	179.9	179.2	179.0	179.9
Height [mm]	78.0	78.0	78.1	77.9	77.7	77.9	78.0	77.9	78.1	78.0
Width [mm]	142.8	143.3	143.3	144.1	143.6	142.9	142.2	142.6	143.1	143.9
Length [mm]	143.2	142.7	142.6	143.2	142.7	142.4	143.1	143.2	142.3	142.8
Density [kg/m^3]	734	661	739	697	705	744	721	704	703	725
Dimensions tolerances: 145^{+5}_{-3} mm; 78^{+1}_{-1} mm Density tolerances: min 600kg/m^3; max 750kg/m^3										

Table 4

Nominal dimensions of blocks: 145mm×100mm×78mm										
	Sample No									
Feature	1	2	3	4	5	6	7	8	9	10
Mass [g]	768	772	761	812	767	780	775	807	760	773
Diagonal [mm]	153.9	153.1	152.8	153.8	153.9	153.5	153.2	152.7	153.5	153.8
Height [mm]	78.4	78.3	78.6	78.6	78.8	78.6	78.5	78.5	78.8	78.4
Width [mm]	99.5	99.8	99.3	99.3	99.3	99.3	99.5	99.2	99.5	99.1
Length [mm]	143.2	143.1	143.0	143.0	143.0	143.2	143.3	143.0	143.0	142.9
Density [kg/m^3]	708	713	704	749	706	720	715	750	699	717
Dimensions tolerances: 145^{+5}_{-3} mm; 100^{+3}_{-3} mm; 78^{+2}_{-0} mm Density tolerances: min 600kg/m^3; max 750kg/m^3										

5.3 Swelling and water absorption after soaking in water

Table 5

Nominal dimensions of blocks: 145mm×145mm×78mm											
Feature	Sample No										Mean value
	1	2	3	4	5	6	7	8	9	10	
Swelling											
Length [%]	0.22	0.20	0.30	0.23	0.39	0.37	0.40	0.51	0.60	0.39	**0.36**
Width [%]	0.21	0.26	0.39	0.22	0.48	0.86	0.47	0.55	0.49	0.32	**0.42**
Height [mm]	78.8	78.9	78.8	78.8	78.9	78.7	79.1	78.9	79.9	79.1	**79.0**
Water absorption											
Mass gain [g]	70	196	62	106	60	54	59	64	70	64	**81**
Water absorption [%]	6.1	19.0	5.3	9.7	5.5	4.7	5.3	5.9	6.5	5.7	**7.4**
Limits: Swelling in length and width: max 2% Swelling in height (max. height): 83mm Water absorption: no limit											

Table 6

Nominal dimensions of blocks: 145mm×100mm×78mm											
Feature	Sample No										Mean value
	1	2	3	4	5	6	7	8	9	10	
Swelling											
Length [%]	0.38	0.30	0.49	0.43	0.38	0.26	0.31	0.22	0.34	0.54	**0.36**
Width [%]	0.31	0.60	0.37	0.63	0.39	0.74	1.00	0.45	0.23	0.82	**0.55**
Height [mm]	79.4	79.4	79.6	79.8	79.6	79.4	79.8	79.8	79.5	79.3	**79.6**
Water absorption											
Mass gain [g]	59	57	62	58	51	49	66	50	54	55	**56**
Water absorption [%]	7.7	7.3	8.2	7.1	6.7	6.3	8.5	6.2	7.1	7.2	**7.2**
Limits: Swelling in length and width: max 2% Swelling in height (max. height): 83mm Water absorption: no limit											

5.4 Transverse tensile strength after boiling

Table 7

Nominal dimensions of blocks: 145mm×145mm×78mm										
Sample No										Mean value
1	2	3	4	5	6	7	8	9	10	
Transverse tensile strength after boiling [N/mm^2]										
0.83	0.96	0.55	0.89	0.84	0.72	0.74	0.75	0.69	0.30	**0.73**
Limits: lower limit: 0.25 N/mm^2										

Table 8

Nominal dimensions of blocks: 145mm×100mm×78mm										
Sample No										Mean value
1	2	3	4	5	6	7	8	9	10	
Transverse tensile strength after boiling [N/mm^2]										
0.89	0.84	1.07	0.94	0.97	0.51	1.20	1.31	0.46	0.72	**0.89**
Limits: lower limit: 0.25 N/mm^2										

5.5 Nail removal test

Table 9

Nominal dimensions of blocks: 145mm×145mm×78mm										
Sample No										Mean value
1	2	3	4	5	6	7	8	9	10	
Extraction force [kN]										
7.4	6.2	7.0	6.6	7.4	6.4	8.0	7.7	5.6	7.2	**6.9**
Limits: lower limit: 5.5 kN										

Table 10

Nominal dimensions of blocks: 145mm×100mm×78mm										
Sample No										Mean value
1	2	3	4	5	6	7	8	9	10	
Extraction force [kN]										
7.0	5.6	6.3	5.9	7.0	5.3	6.8	6.7	6.1	5.9	**6.3**
Limits: lower limit: 5.5 kN										

5.6 Boiling test

Table 11

Nominal dimensions of blocks: 145mm×145mm×78mm					
Feature	Sample No				
	1	2	3	4	5
Cohesion	maintained	maintained	maintained	maintained	maintained
Cracks	not present	not present	not present	not present	not present
Evaluation criteria: No cracks, cohesion maintained					

Table 12

Nominal dimensions of blocks: 145mm×100mm×78mm					
Feature	Sample No				
	1	2	3	4	5
Cohesion	maintained	maintained	maintained	maintained	maintained
Cracks	not present	not present	not present	not present	not present
Evaluation criteria: No cracks, cohesion maintained					

5.7 Formaldehyde content

Table 13

Nominal dimensions of blocks	145mm×145mm×78mm	145mm×100mm×78mm
moisture content [%]	6.4	6.1
Perforator value [mg/100g] atro	5.8	6.9
Limits: Perforator value: max 7.5 mg/100g atro		

6 STATEMENT

Test results presented in this report refer to the tested samples only. The report may not be copied in part, it may be copied in full only.

END OF THE REPORT