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

PHYSICAL AND MECHANICAL TESTING SECTION



AB 088

Poznań, 13.07.2023



TEST REPORT

No BDW-23-A-2957

Subject of the order:

Determination of thermal conductivity of two-layer flooring elements
with top layer made of oak wood

Order No:

PZ/A/DBD/BDW/2957/2023

Name and address of the customer:

P. D. JAWOR Antoni Jan Gawiński
ul. Grunwaldzka 87, 13-300 Nowe Miasto Lubawskie, POLAND

Performance date:

6.07.2023 – 12.07.2023

Operators:

Grzegorz Pajchrowski

Compiled by

Authorized by

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Grzegorz Pajchrowski

Andrzej Noskowiak

A qualified electronic signature has been affixed to this document, which according to the law is equivalent to written form.

1 IDENTIFICATION (TESTED OBJECTS DESCRIPTION)

The objects of the tests were two-layer flooring elements with top layer made of oak wood with nominal thickness of 3.6 mm and bottom layer made of plywood. Customer collected and delivered for testing five elements with nominal dimensions of 900mm×200mm and samples of the top and the bottom layers separately.

2 DATE OF DELIVERY OF TESTED OBJECTS

Samples were delivered to the Laboratory on 26.06.2023 and 6.07.2023.

3 SCOPE AND METHODS OF EXAMINATION

According to the order thermal conductivity by calculation method according to the standard *EN 14342:2013* “Wood flooring and parquet – Characteristics, evaluation of conformity and marking” was determined.

4 APPARATUS

The following equipment was used for the tests:

- electronic thickness gauge MITUTOYO, identification No B24/111,
- electronic calliper MITUTOYO, identification No B12/107,
- laboratory balance, identification No B9/143.

5 TEST RESULTS

Thermal conductivity, expressed by the value of thermal resistance, was calculated according to *p. 4.7* of the standard *EN 14342:2013* based on data from thickness, density and moisture content measurements of individual layers. Density was determined according to the standards *ISO 13061-2:2014* “Physical and mechanical properties of wood – Test methods for small clear wood specimens – Part 2: Determination of density for physical and mechanical tests” and moisture content according to the standards *EN 13183-1:2002* “Moisture content of a piece of sawn timber – Part 1: Determination by oven dry method”. Test results of density and moisture content are summarised in Table 1 and the results of calculations of thermal resistance are summarised in Table 2.

Table 1: Density and moisture content of individual layers in two-layer flooring elements of *P. D. JAWOR Antoni Jan Gawiński* company delivered for testing on 26.06.2023 and 6.07.2023

Sample No	Top layer		Bottom layer	
	Density [kg/m ³]	Moisture content [%]	Density [kg/m ³]	Moisture content [%]
1	723	7.1	700	7.2
2	730	7.1	706	7.7
3	730	7.1	707	7.5
4	753	6.7	717	7.4
5	769	6.7	717	7.6
6	789	6.8	700	7.7
7	783	6.8	705	7.1
8	781	6.7	713	7.4
9	797	6.7	712	7.4
10	689	6.9	708	7.7
11	690	6.9	708	7.5
12	681	6.9	702	7.5
mean value	743	6.9	708	7.5
standard deviation	42	0.2	6	0.2

Table 2: Thermal conductivity of two-layer flooring elements of *P. D. JAWOR Antoni Jan Gawiński* delivered for testing on 26.06.2023 and 6.07.2023

Layer	t [mm]	d [kg/m ³]	w [%]	d ₁₂ [kg/m ³]	λ [W/(m·K)]	R [m ² ·K/W]
top	3.6	743	6.9	762	0.18	0.020
bottom	11.5	708	7.5	724	0.18	0.065
entire element						0.085

t – thickness, d – density, w – moisture content, d₁₂ – density adjusted to a moisture content of 12%,
λ – thermal conductivity coefficient, R – thermal resistance

6 STATEMENT

Test results presented in this report refer to the tested samples only. Without written consent of the Laboratory the Report may not be reproduced in any other form than in its entirety.

END OF THE REPORT
