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Research report No.GT/214/2021

Reference No. GT.4130.225.2021

Testing type	Tested subject	Client's name and address
Selected parameters	GP board	GP ECO Sp. z o.o. Stalowa 4 47-400 Racibórz

SPECIMEN		TESTS	
Number	**Accepted**	**Started**	**Completed**
214/20211	31st August 2021	6th September 2021	27th September 2021

Performed by: **Małgorzata Baran** ……..
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Distribution list:

- Client
- GT

Authorised:

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Approved:

……. (stamp, date and signature)

Specimen Description:
The client provided for testing 3 boards with dimensions of 800mm by 120 mm made of polyvinyl chloride in black color, described as *GP board*.
The sample was assigned with the number 214/2021.

Test description:
The following tests were performed:
1. Density according to PN-EN ISO 1183-1: 2019-05 standard - *Plastics – Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method* using the following conditions and test parameters:

- test method: method A (immersion),
- test liquid: distilled water,
- fragments of the delivered GP board were tested,
- number of test samples: 12.

2. Determination of Shore D hardness in accordance with PN-EN ISO 868: 2005 *Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness)*, using the following test parameters and conditions:

- test temperature: 22.2 ° C,
- before testing, the samples were conditioned at the measurement temperature for minimum 24 hours,
- the test result is the mean and standard deviation of 29 independent measurements.

3. Point of tensile strength, relative extension at the tensile strength point and slasticity modulus in tension in accordance with PN-EN ISO 527-1: 2020-01 standard - *Plastics - Determination of tensile properties - Part 1: General principles* and PN-EN ISO 527-2: 2012 *Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics* using the following parameters and test conditions:

- test temperature: 21.8 ° C,
- before testing, the samples were conditioned under measurement conditions for 24 hours,
- type of test piece: 1B,
- number of test samples used for tests: 5,
- test pieces were cut by machining,

• test speed:
- 1 mm / min during the test of the elasticity modulus in tension,
- 20 mm / min while performing other designations.

4. Determination of the elasticity modulus in bending and point of bending strength in accordance with the PN-EN ISO 178: 2019-06 standard - *Plastics — Determination of flexural properties* using the following test parameters and conditions:

• test samples: type 1,
• samples were cut by machining,
• number of test samples: 5,
• test temperature: 21.8 ° C,
• spacing of supports during the test: 64 mm,
• test method: A - three-point bending,
• test speed: 10 mm / min,
• due to the high flexibility of the material, bending strength determined at a conventional deflection arrow amounting to 3.5%,
• the study was carried out using a universal machine strength model LabTest 6.100 coupled by Labortech with an optical extensometer,
• individual results, mean values and standard deviation of five independent measurements were given as the test result

5. Determination of the elasticity modulus in compression stress for 10% and 20% deformation in accordance with the PN-EN ISO 604: 2006 standard - *Plastics - Determination of compression properties* using the following test parameters and conditions:

• test temperature: 22.6 ° C,
• before testing, the samples were conditioned under the measurement conditions for 24 hours,
• type of test piece: square with a side of about 50 mm,
• test pieces were cut by machining,
• number of test pieces: 5
• test speed: 1 mm / min,
• at the customer's request, the result is given in MPa and in t / m2

Test results: are summarized in Table 1.

Table 1 Test results of the sample No. 214/2021

Tested parameter		Test method	Method status*	Unit	Test result	
					Mean value	Standard deviation
Density		PN-EN ISO 1183-1:2019-05	A	g/cm2	**1,440**	0,005
Shore D hardness		PN-EN ISO 868:2005	A	ºShD	**44,4**	2,4
Elasticity modulus in tension		PN-EN ISO 527-1:2020-01 PN-EN ISO 527-2:2012	A	MPa	**66,3**	7,2
Point of tensile strength					**3,7**	0,6
Relative extension at the tensile strength point				%	**19,2**	4,7
Elasticity modulus in bending		PN-EN ISO 178:2019-06	A	MPa	**108**	14
Point of bending strength					**2,3**	0,1
Elasticity modulus in compression	Compressive stress at relative compression of 10%	PN-EN ISO 604:2006	A	MPa (t/m2)	**3,7 (409)**	0,2 (22)
	Compressive stress at relative compression of 20%				**7,5 (830)**	0,6 (66)

Method status /*: A – testing method within the scope of accreditation

End of the report

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