PCBC

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NOTIFIED BODY No. 1434

PCA Polskie Centrum Akredytacji BADANIA
AB 011

ilac-MRA

TEST REPORT
No. 232/T/2024

issue 1 of 8 October 2024

1. **Description of the test item:** samples in the form of polystyrene boards
   Name: EPS 80
   (data provided by the Customer)

2. **Reference document:**
   EN 13163:2012+A1:2015 *Thermal insulation products for buildings – Factory made expanded polystyrene (EPS) products – Specification*

3. **Customer name and address:** LLC «Thermopanels» 46400, TERNOPIL reg. TERNOPIL DISTRICT, TERNOPIL, STREET LUKIANOVYCHA DENISA, BUILDING 8, 5G

4. **Manufacturer name and address:** LLC «Thermopanels» 46400, TERNOPIL reg. TERNOPIL DISTRICT, TERNOPIL, STREET LUKIANOVYCHA DENISA, BUILDING 8, 5G

5. **Number and date of the customer order:** of 13 May 2024

6. **Tested properties scope:** determination of thermal resistance and thermal conductivity at 10 °C, long term water absorption by immersion, thickness and compressive stress at 10% strain

7. **Sampling date:** samples taken by Customer

8. **Sampling method:** samples taken by Customer

9. **Date of samples delivery to the laboratory:** 29 May 2024

10. **Additions to, deviations or exclusions from the test method:** none

11. Test results:

11.1 Determination of thermal resistance and thermal conductivity at 10 °C – test method in accordance with PN-EN 12667:2002 *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*

- test method: test with a single sample plate device with a heat flux density sensor NETZSCH HFM 436/3/0 LAMBDA
- method of reducing heat loss at the edges: edge insulation
- type of the device: single sample, symmetrical
- position of the device: horizontal
- position of the hot side of the sample: top
- temperature of the environment surrounding the device during the test: 20,2 – 21,4 ºC
- sample thickness: measured in the device under the load of the device plate
- samples conditioned to constant mass according to EN 13163:2012+A1:2015 p. 5.2
- samples density determined in accordance with EN 12667:2001 p. 8.1.1.
- the date of performance of the test: 18 – 19 June 2024

sample number	production date	sample density [kg/m^3]	thickness [mm]	thermal conductivity [W/(m·K)]	thermal resistance [m^{2}K/W]
1	01.04.2024	14,61	49,016	0,0385	1,27
2	01.04.2024	14,62	49,017	0,0380	1,29
3	01.04.2024	16,78	49,004	0,0381	1,29
4	10.04.2024	14,90	47,361	0,0385	1,23
5	10.04.2024	15,03	16,832	0,0380	1,23
6	10.04.2024	15,45	46,932	0,0386	1,22
7	14.04.2024	15,41	16,441	0,0379	1,22
8	14.04.2024	15,28	46,676	0,0378	1,23
9	20.04.2024	14,63	48,990	0,0380	1,29
10	20.04.2024	14,57	49,126	0,0384	1,28
mean value				0,0382	1,26
standard deviation				0,0003	0,03
expanded uncertainty				0,0011	0,03
$\lambda_{90/90}$ ($\lambda_{90,90} = \lambda_{mean} + k \times s_\lambda$)				0,0388	-
$R_{90/90}$ ($R_{90/90} = d_N / \lambda_{90/90}$)				-	1,29*
k				2,07	-
declared values				**0,039**	**1,25***

Given expanded uncertainty comes from a standard uncertainty multiplied by a coverage factor k = 2, which for a normal distribution provides a level of confidence of approximately 95 %.

Detailed test results are presented in the attachments to the Test Report.
*Resistance for a nominal thickness of 50 mm.

11.2 Determination of thickness – test method in accordance with EN ISO 29466:2022 *Thermal insulating products for building applications – Determination of thickness*

- samples conditioned according to EN ISO 29466:2022 p.6.3
- pressure plate (250 ± 5) Pa
- test conditions: 22,1 °C
- the date of performance of the test: 29 July 2024

production date	test results [mm]				thickness [mm]	expanded uncertainty [mm]
22.04.2024	48,5	49,0	49,0	49,0	49	1
29.04.2024	99,0	99,0	98,5	99,0	99	1
03.05.2024	148,5	149,0	149,0	148,5	149	1
10.05.2024	248,5	249,0	248,5	248,5	249	1
Given expanded uncertainty comes from a standard uncertainty multiplied by a coverage factor k ≈ 2, which for a normal distribution provides a level of confidence of approximately 95 %.						

11.3 Determination of compressive stress at 10 % deformation – test method in accordance with EN ISO 29469:2022 *Thermal insulating products for building applications – Determination of compression behaviour*

- samples conditioned according to EN ISO 29469:2022 p.6.4
- surface treatment: without grinding (the condition of flatness and parallelism is met)
- test conditions: 23,0 °C / 50 % relative humidity
- the date of performance of the test: 29 July 2024

production date (nominal thickness)	sample number	compressive stress at 10 % strain [kPa]	mean value [kPa]	standard deviation [kPa]	expanded uncertainty [mm]
22.04.2024 (thickness 50 mm)	1 2 3	86,1 86,3 84,0	85,4	1,3	6,1
29.04.2024 (thickness 100 mm)	1 2 3	89,5 83,5 79,7	84,3	4,9	6,1
03.05.2024 (thickness 150 mm)	1 2 3	80,8 80,3 90,4	83,8	5,7	6,0
10.05.2024 (thickness 250 mm)	1 2 3	87,1 89,1 90,3	88,8	1,6	6,4
Given expanded uncertainty comes from a standard uncertainty multiplied by a coverage factor k ≈ 2, which for a normal distribution provides a level of confidence of approximately 95 %.					

Detailed test results are given in appendixes to the test report.

11.4 Determination of long-term water absorption by immersion - test method in according to EN ISO 16535:2019 Thermal insulation products for buildings - Determination of long-term water absorption by immersion method 2A

- test samples were conditioned in accordance with EN ISO 16535:2019 p.6.4
- date of test: 01 - 29 July 2024.

production date (nominal thickness)	sample number	samples dimensions [mm]	absorption [%(V/V)]	mean value [%(V/V)]	standard deviation [%(V/V)]	expanded uncertainty [%(V/V)]
22.04.2024 (thickness 50 mm)	1 2 3	202,4 x 203,3 x 46,9 202,8 x 199,7 x 46,9 201,5 x 202,9 x 48,5	2,0 1,9 2,1	2,0	0,1	0,1
29.04.2024 (thickness 100 mm)	1 2 3	199,9 x 200,4 x 99,0 200,3 x 200,4 x 98,8 199,9 x 200,3 x 98,8	2,1 2,3 1,9	2,1	0,2	0,1
03.05.2024 (thickness 150 mm)	1 2 3	200,4 x 200,3 x 148,5 200,4 x 199,9 x 148,5 200,0 x 200,4 x 148,5	2,7 2,8 2,6	2,7	0,1	0,1
10.05.2024 (thickness 250 mm)	1 2 3	199,5 x 200,5 x 245,4 200,1 x 200,0 x 246,4 200,2 x 200,2 x 245,2	2,1 2,5 2,4	2,3	0,2	0,1

Given expanded uncertainty comes from a standard uncertainty multiplied by a coverage factor k = 2, which for a normal distribution provides a level of confidence of approximately 95 %.

12. Statement of conformity:

Not applicable.

13. Assessment of performance:

essential characteristic	test method	test result [unit]	declared level class / limit value
Thermal resistance	Thermal resistance and thermal conductivity EN 12667:2001	$\lambda_{90/90}$ = 0,0388 [W/(m·K)] $R_{90/90}$ = 1,29 [m²K/W] for d_N = 20 mm	λ_D = 0,039 [W/(m·K)] (λ_D = 0,040 [W/(m·K)])* R_D = 1,25 for d_N = 20 mm (R_D = 1,25 for d_N = 20 mm)*
	Thickness EN ISO 29466:2022	production date: 22.04.2024, d_N = 50 mm, test result: 49 [mm] production date: 29.04.2024, d_N = 100 mm, test result: 99 [mm] production date: 03.05.2024, d_N = 150 mm, test result: 149 [mm] production date: 10.05.2024, d_N = 250 mm, test result: 249 [mm]	T1 (T2*)
Water permeability	Long term water absorption by immersion EN ISO 16535:2019	production date: 22.04.2024, d_N = 50 mm, test result: 2,0 [%(V/V)] production date: 29.04.2024, d_N = 100 mm, test result: 2,1 [%(V/V)] production date: 03.05.2024, d_N = 150 mm, test result: 2,7 [%(V/V)] production date: 10.05.2024, d_N = 250 mm, test result: 2,3 [%(V/V)]	WL(3) (WL(3)*)
Compressive strength	EN ISO 29469:2022	production date: 22.04.2024, d_N = 50 mm, test result: 85,4 [kPa] production date: 29.04.2024, d_N = 100 mm, test result: 84,3 [kPa] production date: 03.05.2024, d_N = 150 mm, test result: 83,8 [kPa] production date: 10.05.2024, d_N = 250 mm, test result: 88,8 [kPa]	CS(10)80 (CS(10)70*)

*Result including measurement uncertainty

This document is not a Declaration of Performance.
Test results have been taken into account in the determination of the product type (and measurement uncertainty).
The laboratory shall not be responsible for the parameters specified in the Declaration of Performance issued by the Manufacturer.

14. Notes

No phenomena that could affect the obtained results were observed.
The estimated measurement uncertainty relates only to the tested sample.

Test report prepared by:

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