ACCREDITED LABORATORY TEST REPORT No. 415600872-01

Client:	SIA "BALTIC FENSTER"
	VAT: LV40003799656
Address:	Ilūkstes iela 32–43, LV-1062 Riga, Latvija
Subject of the test:	The frame profiles of PVC Polywin 705 system two-sash window with insulating infill panel, the left side: fixed light and the right side: tilt and turn casement
Sample received on:	29.06.2023
Report elaborated by:	Ing. Nizar Al-Hajjar
Place and date of issue:	Zlín, 13. 07. 2023
Annex:	Annex No. 1 - Technical specification of the product given by the client

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Ing. Jiří Růžička
Head of Construction Testing Laboratory Zlín

Ing. Petra Hrdinová
Head of Accredited Testing Laboratory

Subject of the test:

Table No. I – Description and identification of test subject

ITC's identification number	Identification of test subject/specimen by client
415600872/1	The frame profiles of PVC Polywin 705 system two-sash window with insulating infill panel, the left side: fixed light and the right side: tilt and turn casement Manufacturer: DENİZPEN PLASTİK SANAYİ VE TİCARET LTD. ŞTİ. Turkey
415600872/2-1 415600872/2-2	Samples of insulation infill panel of the Sample No. 415600872/1

Table No. II – Description and identification of test subject/sample by the client – ident. No. 415600872/1

Construction part	Description
Frame and sash	Frame profile: P705.10 of 1 230 mm x 1 480 mm size / frame reinforcement: U 29*28*29 galvanized steel 2,0 mm thick; sash profile (tilt and turn casement): P705.30 of 561 mm x 1 400 mm size / sash reinforcement: U 29*28*29 galvanized steel 2,0 mm thick; column profile: P705.20/ column reinforcement: U 29*28*29 galvanized steel 2,0 mm thick
Other profiles	glazing bead: YP.C.60 with internal glazing gasket
Insulating infill panel	Insulating infilling sandwich panel 24 mm thick of composition: 1,0 mm PVC – 22,0 mm XPS thermal insulation – 1,0 mm PVC
Sealing	Inner gasket; outer glazing gasket; outer gasket
Drainage and decompression	Sash: inlet 2 holes on the left and right sides of diameter 6 mm, outlet 2 holes of diameter 6 mm; sash decompression: not performed; frame drainage: inlet 2 holes on the left and right sides of diameter 6 mm and outlet 2 holes of diameter 10 mm
Hardware	All-Peripheral hardware Vorne, Turkey; sash on the right side with two tilt and turn hinges

Table No. III – Description and identification of test subject – description of submitted sample No. 415600872/1

Construction part	Description
Frame and sash	Frame: PVC of thickness 70,32 mm / frame reinforcement: steel; measured thickness 2,0 mm; sash: PVC of thickness 70,15 mm / sash reinforcement: steel; measured thickness 2,0 mm; total window size 1 230 mm x 1 480 mm; right sash size 560 mm x 1 400 mm
Other profiles	glazing bead with gasket
Insulating infill panel	Insulating sandwich panel 24,0 mm thick of 510 mm x 1 345 mm size (left fixed light) and 410 mm x 1 245 mm size (right sash) of composition: 1,0 mm PVC – 22,0 mm thermal insulation – 1,0 mm PVC
Sealing	Inner: cavity gasket inserted in the groove, welded in the corner; outer: cavity gasket inserted in the groove, welded in the corner; inner glazing gasket coextruded in the glazing bead; outer glazing gasket coextruded in the sash profile
Drainage and decompression	Drainage of the sash – on the bottom: 4 inlet holes of diameter 8 mm and 2 outlet holes of diameter 6 mm; decompression of the sash – on the top: 4 inlet holes of

	diameter 8 mm and 2 outlet holes of diameter 6 mm; Drainage of the frame – left and right: on the bottom 4 internal holes of diameter 8 mm and on the external 2 holes of diameter 10 mm; decompression of the frame: not performed
Hardware	All-Peripheral hardware VORNE, right casement: 7 point closure, 2 tilt and turn hinges, controlling by handle

Table No. IV – Description and identification of test subject – description of submitted sample ident. No. 415600872/2-1 and No. 415600872/2-2

Construction part	Description
Sample of insulating sandwich panel	Insulating sandwich panel 24,0 mm thick of composition: 1,0 mm PVC – 20,0 mm thermal insulation – 1,0 mm PVC; Size of two samples: (500 x 500) mm.

Sampling method used:
Tested Sample marked as No. 415600872/1 was collected and supplied to the laboratory by the client. The laboratory is not responsible for the way of the Sample collecting.

Documentation delivered by the client:
Technical product specification – annex No. 1
Drawing documentation – The cross section of the tested Sample is on the figure No. 1

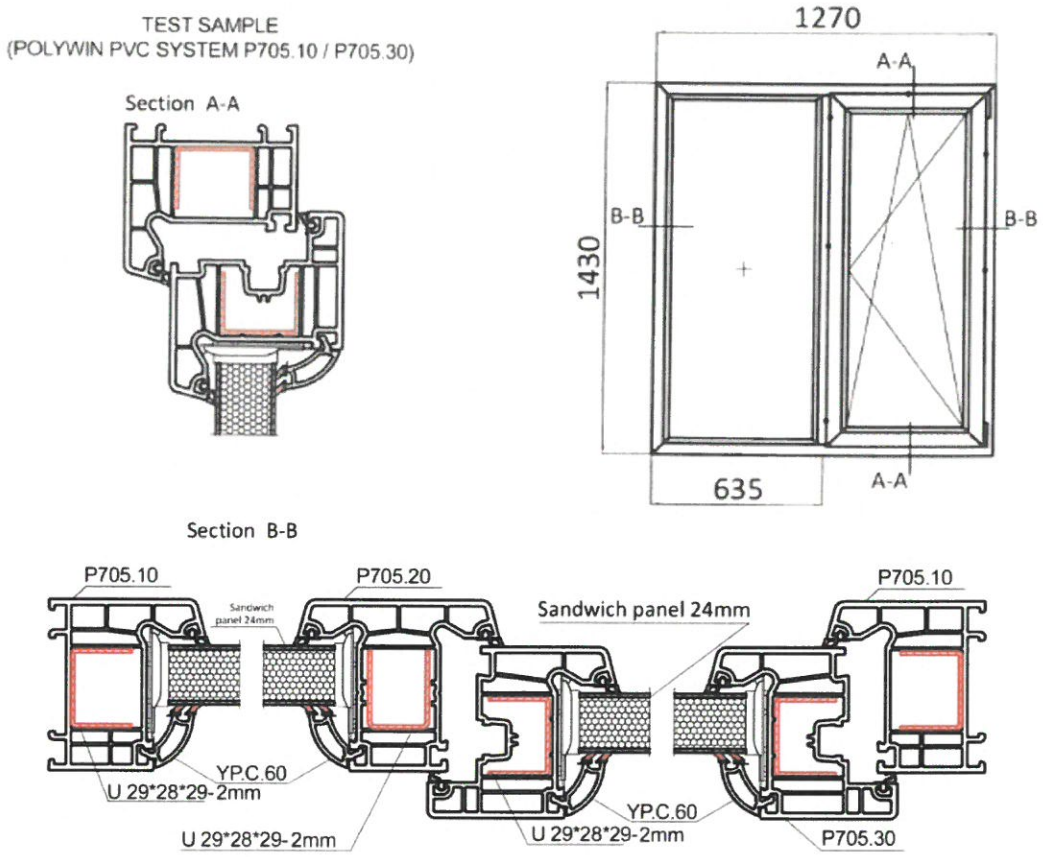

Figure No. 1: The scheme and the cross section of the tested Sample No. 415600872/1

The photo of the cut profile of the Sample No. 415600872/1 is in the figure No. 2.

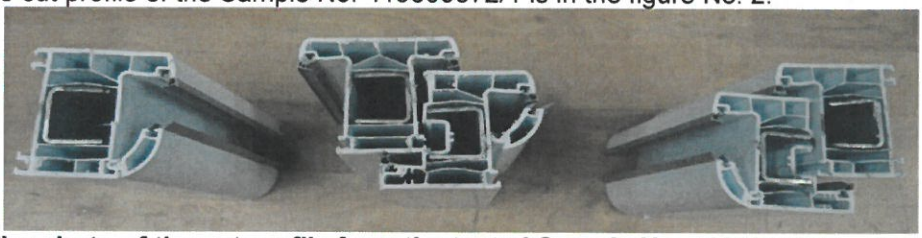

Figure No 2: The photo of the cut profile from the tested Sample No. 415600872/1 – Description of the photos from the left side: Frame; connection of the profiles column and sash; sash and frame

Work requested:
Thermal transmittance U_f determination of PVC window profiles (Sample No. 415600872/1) and thermal resistance determination of infill insulation (Samples No. 415600872/2-1 and No. 415600872/2-2).

Testing method used:
1. Thermal transmittance determination. Hot Box method according to ČSN EN 12412-2
2. Thermal resistance determination. Guarded Hot Plate method according to ISO 8302.

Test conditions:
1. Average air temperature in the laboratory during the measurement: 22,1 °C
   Average relative humidity in the laboratory during the measurement: 40 % r. v.

Air speed on the cold side 1,8 m/s; air flow direction up along the Sample
Air speed on the warm side 0,1-02 m/s; air flow direction up along the Sample
Hot box area A_{HB} = 2,465 m^2.
The scheme of the testing equipment is in figure No. 3.

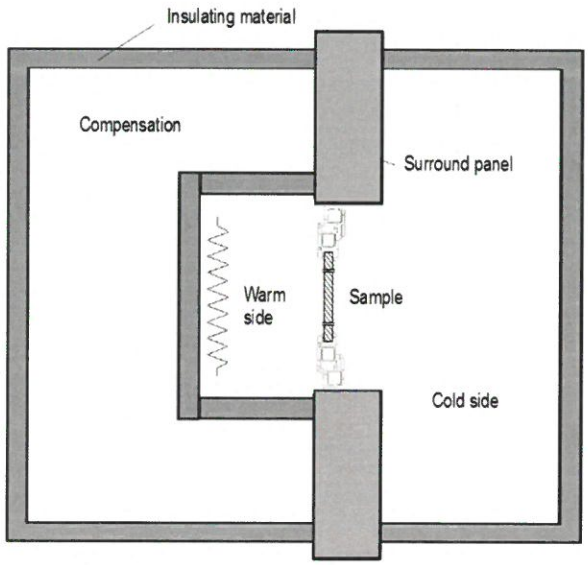

Figure No. 3: The scheme of the testing equipment

2. A two Samples No. 415600872/2-1 and No. 415600872/2-2 of 500 mm x 500 mm size was prepared from the infill insulation of the sample No. 415600872/1, on which thermal resistance test was carried out.

The laboratory is not responsible for information provided by the client that may have influence on the validity of the test results. Additional information that is required by the standard(s) and is not provided here is available on request from the laboratory.

Place where the tests have been carried out:
The tests have been carried out in the workplace No. 1 – K Cihelně 304, 764 32 Zlín – Louky.

Test results:
The test results are given in the following tables:

Table No. V – Infill insulation – Sample No. 415600872/2-1 and No. 415600872/2-2

Measured quantity	Symbol	Unit	Test result	Uncertainty [1)]
Thermal resistance at mean temperature $t_{stř}$ = 10,08 °C	R	$m^2 \cdot K/W$	0,707	3,5 %

[1)] The given extended measurement uncertainty u_R of thermal resistance is determined by the product of the standard measurement uncertainty and the expansion coefficient k = 2, which for a normal distribution corresponds to a probability of coverage of about 95%.

Note: The results in this table are average values of both samples.

Table No. VI – Frames of PVC window, Sample No. 415600872/1

Measured quantity	Symbol	Unit	Test result
Inside air temperature	θ_{ni}	°C	20,98
Outer air temperature	θ_{ne}	°C	-0,36
Input power to hot box	Φ_{in}	W	51,632
Surround panel heat flow	Φ_{sur}	W	1,807
The heat flow rate through the edge zone	Φ_{edge}	W	2,011
Test Sample heat flow	Φ_f	W	18,585
Thermal insulation infill heat flow	Φ_{fi}	W	29,230
Total surface thermal resistance	$R_{s,t}$	$m^2 \cdot K/W$	0,144
Thermal transmittance of the frames	U_f	$W/(m^2 \cdot K)$	1,388
Time of measuring in stable state		hour	8
Design test Sample area	A_f	m^2	0,5764
Relative frame and sash area (inner/outer)	A_f / A_t	%	34,3 / 34,5

Thermal resistance of surround panel in $m^2 \cdot K/W$:
$R_{sur} = (d_{sur} / \lambda_{sur})$; $\lambda_{sur} = 0{,}03179 + 0{,}00012\ \theta_{me,sur}$
Where λ_{sur} is thermal conductivity of testing surround panel in W/(m·K);
d_{sur} the thickness of testing surround panel, its value is 0,250 m;
$\theta_{me,sur}$ the mean temperature value of both surfaces of testing surround panel in °C.
Linear thermal transmittance Ψ_{edge} = 0,01739 W/(m·K); the frame thickness w = 70,3 mm.

Table No. VII – Frames of PVC window, Sample No. 415600872/1

Measured quantity	Symbol	Unit	Result	Uncertainty [1)]
Thermal transmittance	U_f	$W/(m^2.K)$	1,4	4 %

[1)] Extended uncertainty *for* expansion coefficient k = 2, which for a normal distribution corresponds to a probability of coverage of about 95%

..... End of the test report.....

Annex No. 1 to the test report No. 415600872-01

Specification of test product - plastic window or door

1. *Drawing test product*:
- Front view includes dimensions of the frame and sash (fixed /visible/ glazed parts), schematic illustration of the location of hardware components and way of opening
- Specimen cross-section (vertical: lower frame including seals and glazing), (horizontal for architraves); (horizontal and vertical: door with a threshold); main dimensions and identifications of the used profiles, drainage design and compression in the frame and sash (dimensions, location and number of holes)

2 Manufacturer / Construction (window, door, casement door): **DENİZPEN PLASTİK** SANAYİ VE TİCARET LTD. ŞTİ. (Turkey)

3 Title (type) of the window and door system: Polyvinyl chloride frost-resistant profiles of the **Polywin** trademark of the **705** system

4 Specification of the components and their factories; state the materials and manufacturer's marking

- Main profiles factory:	Frame specimen size B x H: 1230mm*1480mm **DENİZPEN PLASTİK** SANAYİ VE TİCARET LTD. ŞTİ.	Sash: size b x h: 561mm*1400mm**DENİZPEN PLASTİK** SANAYİ VE TİCARET LTD. ŞTİ.	clapper + architrave, the way of sealing to the sash (sealant, profile):
- Reinforcement, thickness factory:	**29*28*29-2mm**		
- Other profiles factory:	mullion a transom, glazing bar, threshold profiles, sash drainage		
- Sealing factory:	Inner + performing in the corners* **DENİZPEN PLASTİK** SANAYİ VE TİCARET LTD. ŞTİ.	Central + performing in the corners*	
	outer+ performing in the corners	threshold	
- Sealing factory:	of the glazing: outer+ performing in the corners* welded seals	Glazing bead a sealing profile + performing in the corners*	
Glazing unit/Insulating infill panel factory:	Type, marking and composition of IGU including the coating and spacer type or infilling panel Sandwich panel 24 mm thick and composition: 1,0 mm PVC – 21,6 mm thermal insulation XPS – 1,0 mm PVC; manufacturer R.T.kování a.s. Manufakturer CHUP Avroraplast (RB)		

5 Drainage performing and compression in the frame and sash (*for example: 3 holes (5x30)mm down into profile, 2 holes /openings/ (5x28)mm with formed cover; 2 upper holes; interrupting of the outer profile sealing in the length always (50) mm, …*
Sash drainage: inlet 2 holes on the left and right sides diameter 6 mm, outlet 2 holes diameter 6 mm, sash decompression: not performed; frame drainage: inlet 2 holes on the left and right sides diameter 6 mm and outlet 2 holes diameter 10 mm

6 Hardware (marking of the type and manufacturer):
Vorne, Turkey

Closures (right, left sash, others): number of point closures, way of controlling, supporting thrusts, special points
Sash on the right side, one

Hinges (right, left sash, others): type (hung-casement, tilt and turn)
Right-hand swing-out

7 Note: (surface treatment, sealants used in the sealing, glazing, bed stabilization)

8 Production date:

** Performing in the corners: continuous bent, cut out, cut, cut and glued in the corners, welded, bent, and others*

Note: The results given in this Test Report apply only to the sample tested by our laboratory!
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