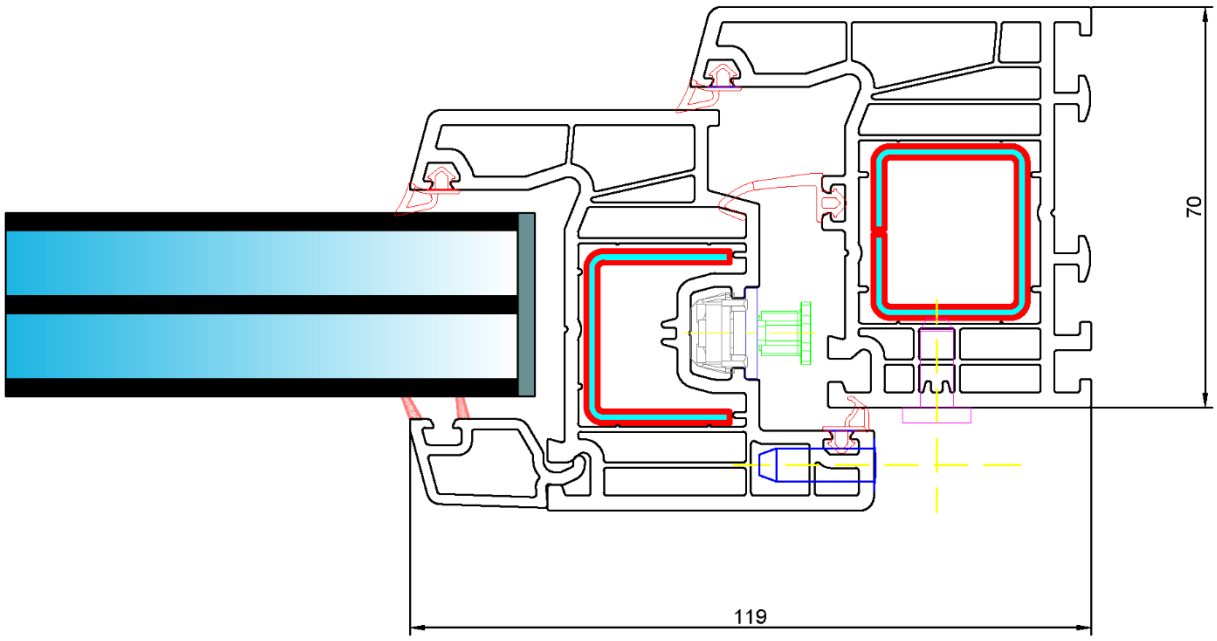
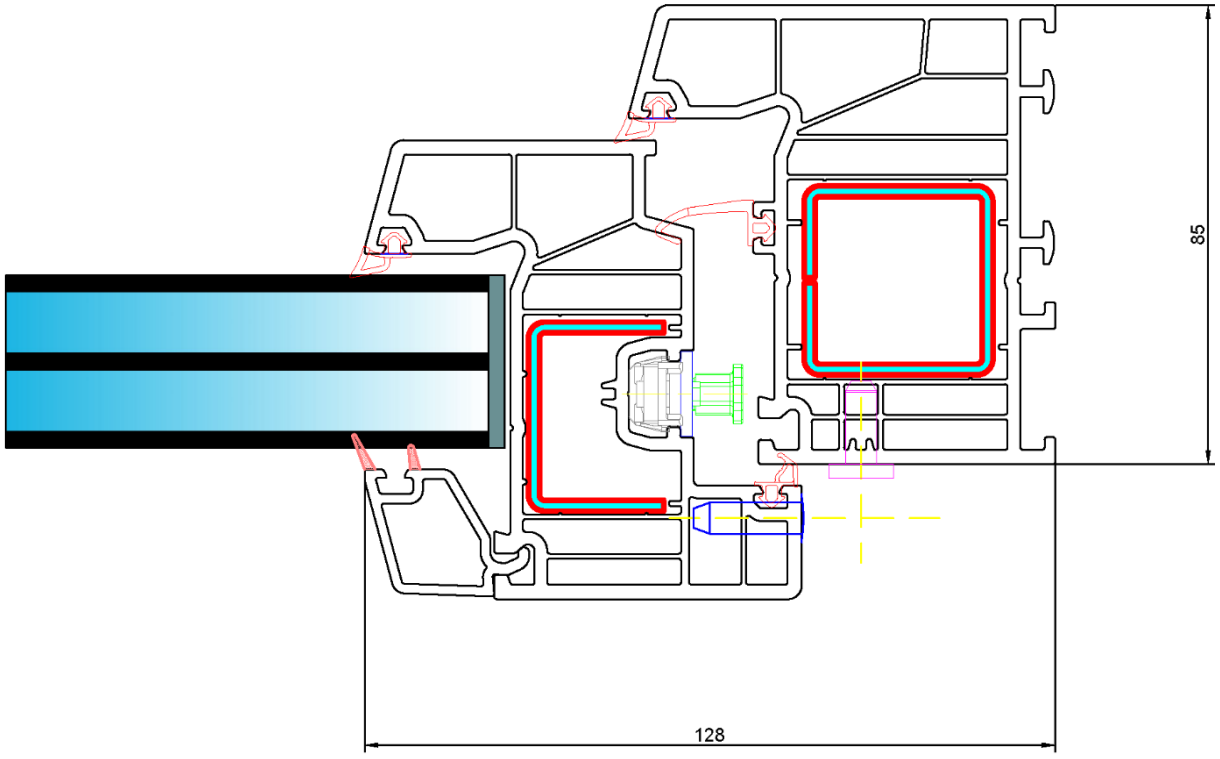
15 November 2022

1. Profile 70 mm



2. Profile 85 mm



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1. Materials and boundary conditions

Material	λ[W/(m·K)]	ε	μ[-]
EPDM (ethylene propylene diene monomer)	0,250	0,900	
PVC (polyvinylchloride), rigid	0,170	0,900	
Panel	0,035	0,900	
Slightly ventilated air cavity *			1,000
Steel	50,000	0,900	
Steel	50,000	0,300	
Unventilated air cavity *			1,000

* EN ISO 10077-2:2017, 6.4.3/anisotrop

Boundary Condition	q[W/m²]	θ[°C]	R[(m²·K)/W]	ε	φ[%]
Epsilon 0.3				0,300	
Epsilon 0.9				0,900	
Exterior, frame		0,000	0,040		
Interior, frame, normal		20,000	0,130		
Interior, frame, reduced		20,000	0,200		
Symmetry/Model section	0,000				

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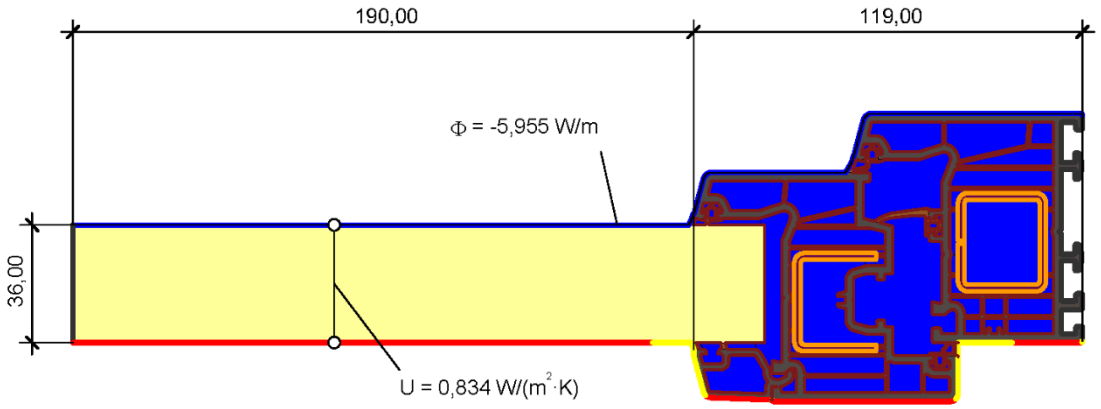
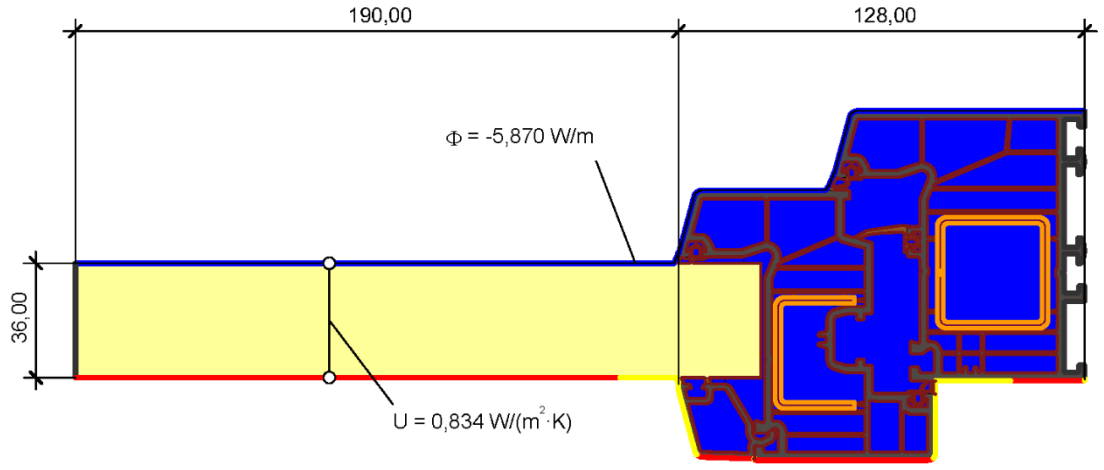
2. Profiles

2.1. Profile 70 mm



$$U_f = \frac{\frac{\Phi}{\Delta T} - U_p \cdot b_p}{b_f} = \frac{\frac{5{,}955}{20{,}000} - 0{,}834 \cdot 0{,}190}{0{,}119} = 1{,}2\ W/(m^2 \cdot K)$$

2.2. Profile 85 mm



$$U_f = \frac{\frac{\Phi}{\Delta T} - U_p \cdot b_p}{b_f} = \frac{\frac{5{,}870}{20{,}000} - 0{,}834 \cdot 0{,}190}{0{,}128} = 1{,}1\ W/(m^2 \cdot K)$$

Entwicklungs- und Prüflabor Holztechnologie GmbH · Zellescher Weg 24 · 01217 Dresden · Germany

KONTURA Sh.p.k
Vitomerice/3
30000 PEJE
KOSOVO

Entwicklungs- und Prüflabor
Holztechnologie GmbH
Zellescher Weg 24
01217 Dresden

Tel.: +49 351 4662 0
Fax: +49 351 4662 211
info@eph-dresden.de
www.eph-dresden.de

Dresden, 15 November 2022

Test Report
No. 2622195

Client:	KONTURA Sh.p.k Vitomerice/3 30000 PEJE/KOSOVO
Task:	Calculation of thermal transmittance U_f
Contractor:	Entwicklungs- und Prueflabor Holztechnologie GmbH Laboratory Material- and Product Testing Zellescher Weg 24
Persons in Charge:	B. Eng. (BA) Matthias Obst

Dipl.-Ing. Jens Gecks
Head of Laboratory Material- and Product Testing

The test report contains 3 pages and 2 annexes with a total of 3 pages. Any duplication, even in part, requires written permission of EPH. These test results are exclusively related to the tested material.

1. Terms of Reference

The accredited Entwicklungs- und Prueflabor Holztechnologie Dresden GmbH were assigned by KONTURA Sh.p.k. Company to calculate the thermal transmission U_f for PVC profiles at thickness of 70 mm and 85 mm intended for the use of window frame acc. to EN ISO 10077-2:2017.

Statements on conformity assessment/classification were made on the basis of the measurement results obtained. Measurement uncertainties are not included in the assessment (ILAC G8 03/2009 "Guidelines on the Reporting of Compliance with Specification" Section 2.7).

2. Material and calculation

2.1 Basis of calculation

The Client provided the information regarding dimension and material at dxf file format. The Client is responsible for the correctness of the data. A Contractor checked the plausibility of the data.

The technical drawings at annex 1 were used for calculation of the thermal transmission (drawings without scale).

2.2 Material

The listed materials and their specific thermal conductivity values are based on Client's information and the data at EN ISO 10077-2:2017.

Table 1: Materials and their specific thermal conductivity

Element	Component	Material	Thermal conductivity [W/(m*K)]	Basis
Frameprofil	Frame	PVC	0,13	EN ISO 10077-2
	Reinforcing	Steel	50	EN ISO 10077-2
	Sealing gasket	EPDM	0,250	EN ISO 10077-2

2.3 Boundary condition

The values of air temperature and thermal resistance for interior and exterior frame were taken from EN ISO 10077-2:2017.

Table 2: Boundary condition for thermal transmittance U_f

		Air temperature [°C]	Thermal resistence [m^2*K/W]
Interior frame	normal	20	0,13
	reduced		0,20
Exterior frame		0	0,04

A thermal insulating panel at a thermal conductivity of λ = 0,035 W/(m*K) was used for the calculation of the thermal transmittance of the window frame.

3. Realisation of calculation

For the calculation of the thermal transmittance U_f by two dimensional calculation method, the software package "flixo professional", Version 8.1 (infomind GmbH) was used based on EN 10077-2:2017 and data listed at Chapter 2 of this report.

4. Calculation result

Table 3: Result

System (thickness)	Result	
	Width [m]	U_f [W/m²*K]
70 mm	0,119	1,2
85 mm	0,128	1,1

(For detailed results of the calculation, see Annex 2)

B. Eng. (BA) Matthias Obst
Person in Charge