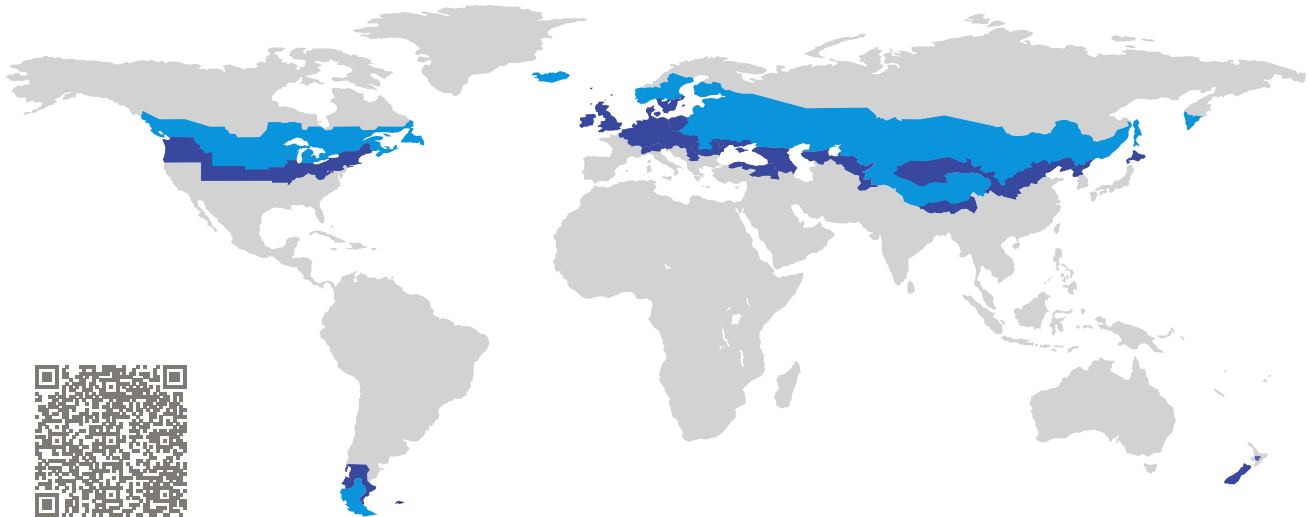


CERTIFICATE

Certified Passive House Component

Component-ID 1885wi02 valid until 31st December 2022

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany

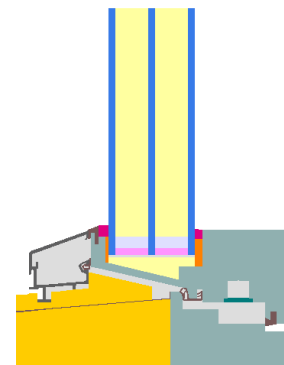


Category: **Window Frame**
Manufacturer: **pro Passivhausfenster GmbH,
Oberaudorf,
Germany**
Product name: **smartwin arctic**

**This certificate was awarded based on the following
criteria for the cold climate zone**

Comfort $U_W = 0.60 \leq 0.60 \text{ W}/(\text{m}^2 \cdot \text{K})$
 $U_{W,\text{installed}} \leq 0.65 \text{ W}/(\text{m}^2 \cdot \text{K})$
with $U_g = 0.52 \text{ W}/(\text{m}^2 \cdot \text{K})$

Hygiene $f_{Rsi=0.25} \geq 0.75$



Passive House
efficiency class

phE

phD

phC

phB

phA

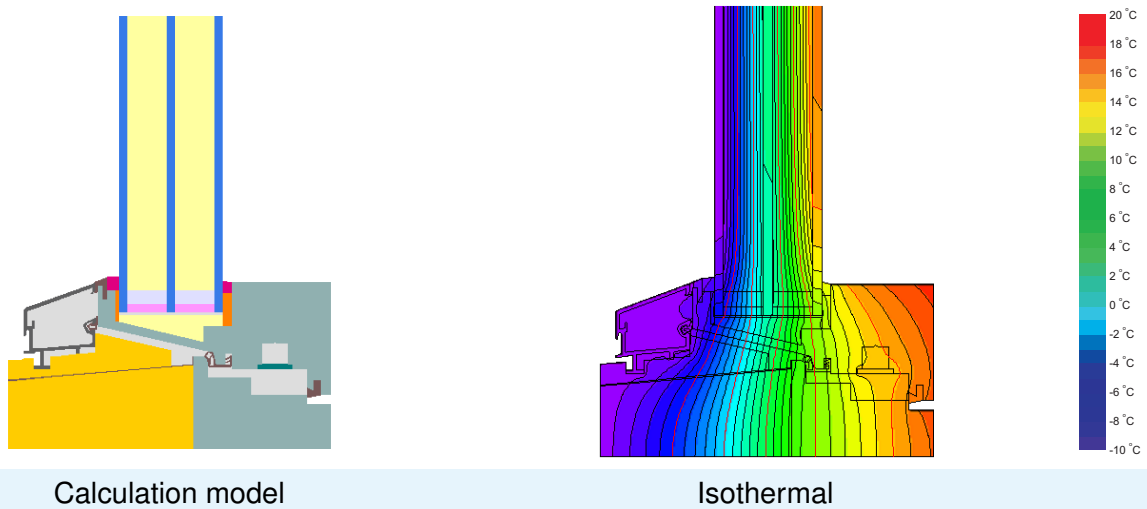
www.passivehouse.com

cold climate



**CERTIFIED
COMPONENT**

Passive House Institute



Description

Timber Aluminium frame, insulated by PET-foam with different densities, 0.036 and 0.055 W/(mK) and phenolic foam, 0.022 W/(mK) in the glazing rebate. Glass loads are carried by special corner pieces. The window installation will be designed individually by the manufacturer. Pane thickness: 48 mm (4/18/4/18/4), rebate depth: 13 mm. Spacer: Multitech G.

Explanation

The window U-values were calculated for the test window size of 1.23 m × 1.48 m with $U_g = 0.52 \text{ W}/(\text{m}^2 \cdot \text{K})$. If a higher quality glazing is used, the window U-values will improve as follows:

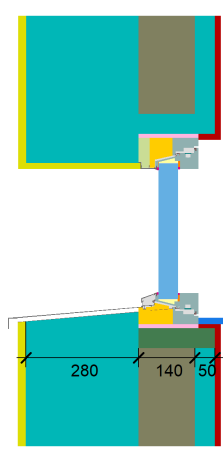
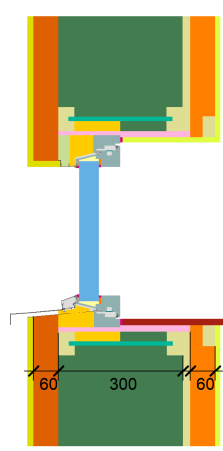
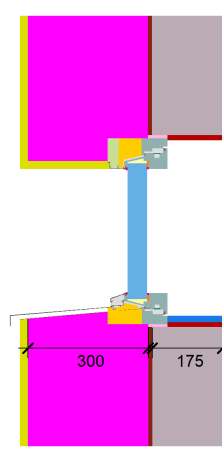
Glazing	$U_g =$	0.52	0.60	0.48	0.35	$\text{W}/(\text{m}^2 \cdot \text{K})$
		↓	↓	↓	↓	
Window	$U_W =$	0.60	0.67	0.57	0.47	$\text{W}/(\text{m}^2 \cdot \text{K})$





Transparent building components are classified into efficiency classes depending on the heat losses through the opaque part. The frame U-Values, frame widths, thermal bridges at the glazing edge, and the glazing edge lengths are included in these heat losses. A more detailed report of the calculations performed in the context of certification is available from the manufacturer.

The Passive House Institute has defined international component criteria for seven climate zones. In principle, components which have been certified for climate zones with higher requirements may also be used in climates with less stringent requirements. In a particular climate zone it may make sense to use a component of a higher thermal quality which has been certified for a climate zone with more stringent requirements.

Further information relating to certification can be found on www.passivehouse.com and passipedia.org.

Validated installations

Formwork blocks (operable)	Lightweight timber (operable)	Exterior insulation and finishing system (EIFS) (operable)
$U_{Wall} = 0.10 \text{ W}/(\text{m}^2 \cdot \text{K})$	$U_{Wall} = 0.10 \text{ W}/(\text{m}^2 \cdot \text{K})$	$U_{Wall} = 0.10 \text{ W}/(\text{m}^2 \cdot \text{K})$
		
$\Psi_{install}$ W/(m · K)	$\Psi_{install}$ W/(m · K)	$\Psi_{install}$ W/(m · K)
Top 0.014	Top 0.015	Top 0.007
Side 0.014	Side 0.015	Side 0.007
Bottom 0.027	Bottom 0.017	Bottom 0.016
$U_{W,installed} = 0.65 \text{ W}/(\text{m}^2 \cdot \text{K})$	$U_{W,installed} = 0.65 \text{ W}/(\text{m}^2 \cdot \text{K})$	$U_{W,installed} = 0.63 \text{ W}/(\text{m}^2 \cdot \text{K})$

Frame values		Frame width b_f mm	U -value frame U_f W/(m ² · K)	Ψ -glazing edge Ψ_g W/(m · K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Flying Mullion (FM1)		92	0.61	0.027	0.76
Bottom (OB1)		77	0.62	0.028	0.75
Top (OH1)		77	0.54	0.028	0.76
Lateral (OJ1)		77	0.54	0.028	0.76
		Spacer: MULTITECH G	Secondary seal: Polysulfid		

