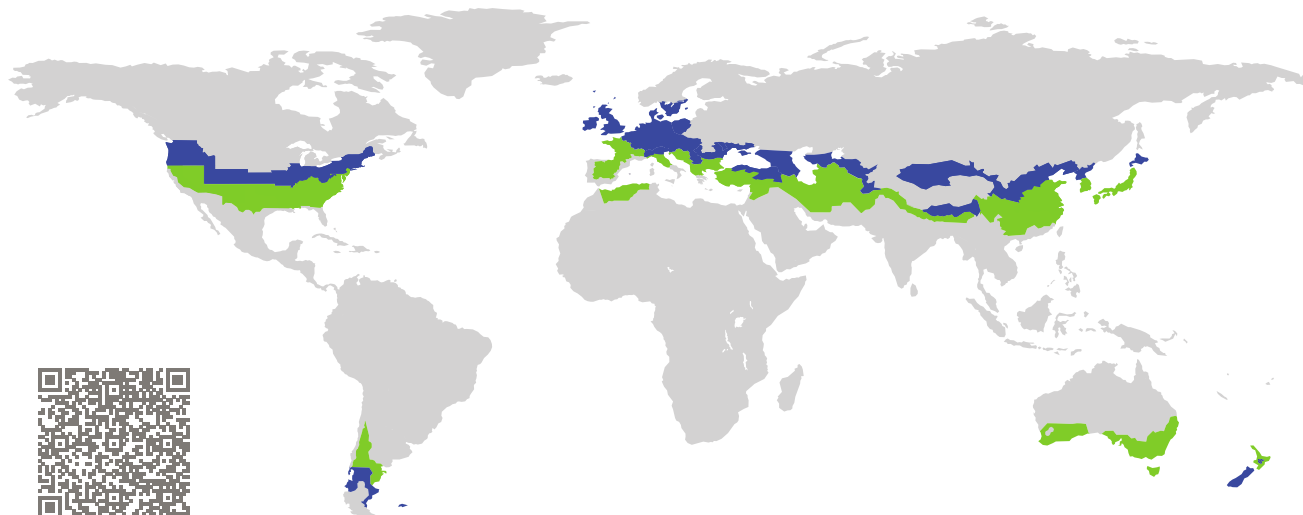


CERTIFICATE

Certified Passive House Component

Component-ID 1022cw03 valid until 31st December 2025

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany

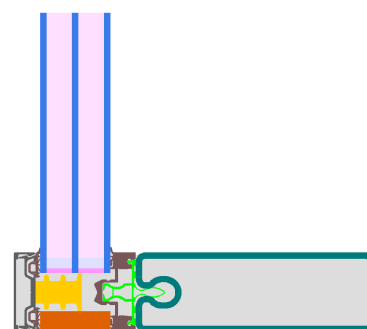


Category: **Curtain Wall**
Manufacturer: **RAICO Bautechnik GmbH,
Pfaffenhausen,
Germany**
Product name: **THERM+50 FS-I**

**This certificate was awarded based on the following
criteria for the cool, temperate climate zone**

Comfort $U_{CW} = 0.79 \leq 0.80 \text{ W}/(\text{m}^2 \text{ K})$
 $U_{CW, \text{installed}} \leq 0.85 \text{ W}/(\text{m}^2 \text{ K})$
with $U_g = 0.70 \text{ W}/(\text{m}^2 \text{ K})$

Hygiene $f_{Rsi=0.25} \geq 0.70$



Passive House
efficiency class

phE

phD

phC

phB

phA

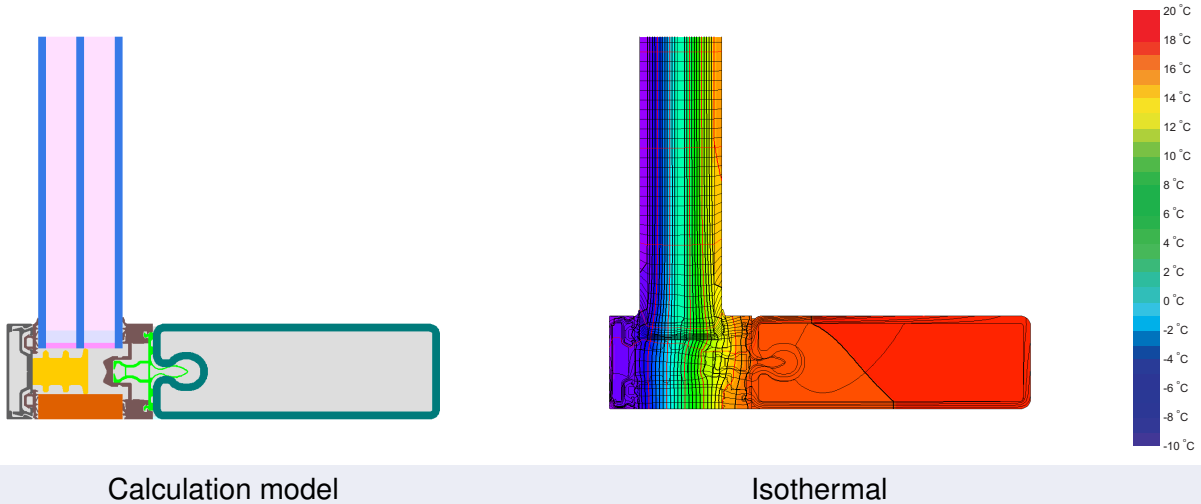
phA+

cool, temperate climate



**CERTIFIED
COMPONENT**

Passive House Institute



Calculation model Isothermal

Description

Construction: Steel aluminum curtain wall with insulation inside the glazing rebate (0.038 W/(mK)) with aluminium foil applied on the inside. Pane thickness: 44 mm (4/16/4/16/4), rebate depth: 13 mm, spacer: SWISSPACER Ultimate. Different versions of pressureplate, coverstrip and insulating material are available and have been evaluated. These values can be provided by the system provider and the PHI on request. The glazing was calculated with a 3 mm secondary seal. As it is often the case that this is thicker, today the calculation is carried out with a 6 mm secondary seal. This leads to a higher glazing edge thermal bridge, which can also be estimated by way of the spacer certificates: www.passivhauskomponenten.org / glazing edge bonds. The higher rates of heat loss can be compensated for by using e. g. improved glazing.

Explanation

The element U-values were calculated for the test element size of 1.20 m × 2.50 m with $U_g = 0.70 \text{ W}/(\text{m}^2 \text{ K})$. If a higher quality glazing is used, the element U-values will improve as follows:

Glazing	$U_g =$	0.70	0.64	0.58	0.52	W/(m ² K)
		↓	↓	↓	↓	
Element	U_{CW}	0.79	0.73	0.68	0.62	W/(m ² K)

Transparent building components are sorted 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 that have been certified for climate zones with higher thermal 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.

Frame values			Frame width b_f mm	U -value frame U_f^1 W/(m ² K)	Ψ -glazing edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Mullion fixed	(0M1)		50	0.90	0.031	0.78
Transom fixed	(0T1)		50	0.93	0.030	0.78
Transom 1 casement	(1T1)		90	1.07	0.028	0.68
Bottom fixed	(FB1)		50	0.78	0.030	0.78
Top fixed	(FH1)		50	0.78	0.030	0.78
Lateral fixed	(FJ1)		50	0.78	0.030	0.78
			Spacer: SWISSPACER Ultimate		Secondary seal: Polysulfide	

Thermal glass carrier bridge² $\chi_{GT} = 0.004$ W/K

Validated installations

Ventilated facade (fixed glazing)		Exterior insulation and finishing system (EIFS) (fixed glazed)		Cavity wall (fixed glazing)	
$U_{Wall} = 0.13$ W/(m ² K)		$U_{Wall} = 0.13$ W/(m ² K)		$U_{Wall} = 0.13$ W/(m ² K)	
$\Psi_{install}$	W/(m K)	$\Psi_{install}$	W/(m K)	$\Psi_{install}$	W/(m K)
Top	0.042	Top	0.044	Top	0.043
Left	0.042	Left	0.044	Left	0.043
Right	0.042	Right	0.044	Right	0.043
Bottom	0.054	Bottom	0.050	Bottom	0.054
$U_{W,installed} = 0.84$ W/(m ² K)		$U_{W,installed} = 0.84$ W/(m ² K)		$U_{W,installed} = 0.84$ W/(m ² K)	

¹ Includes $\Delta U = 0.21$ W/(m² K). Determined through 3D FEM simulation

² Determined through 3D FEM simulation. Glass carrier type: Non-metallic

