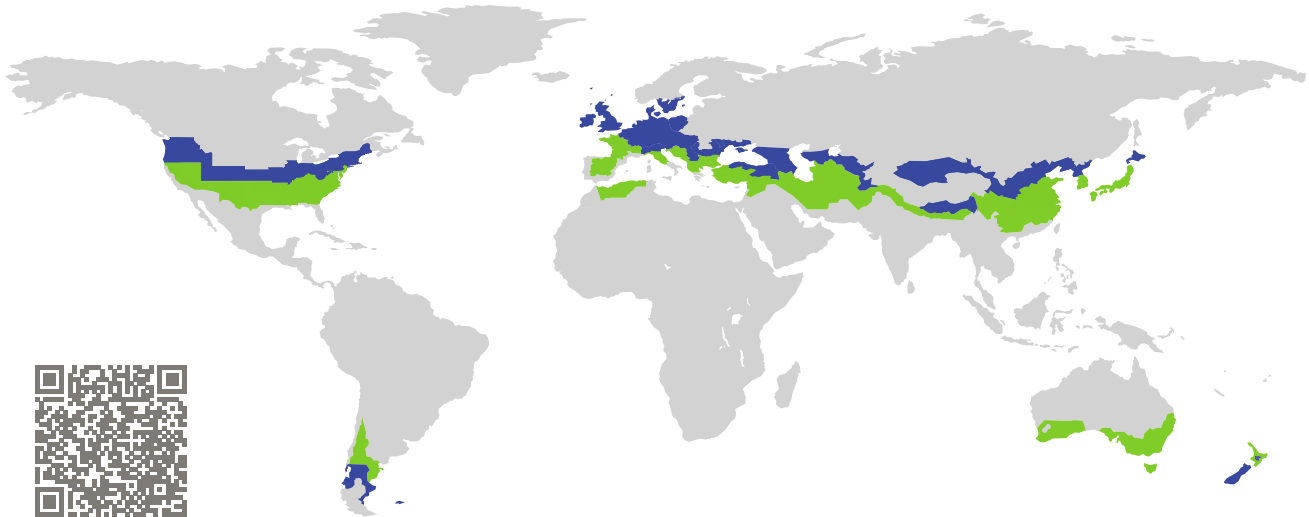


CERTIFICATE

Certified Passive House Component

Component-ID 0963cw03 valid until 31st December 2016

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany

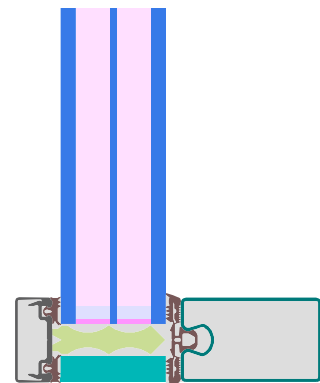


Category: **Curtain Wall**
Manufacturer: **Forster Profilsysteme AG,
Arbon,
Switzerland**
Product name: **forster thermfix® vario Hi 45 mm**

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

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

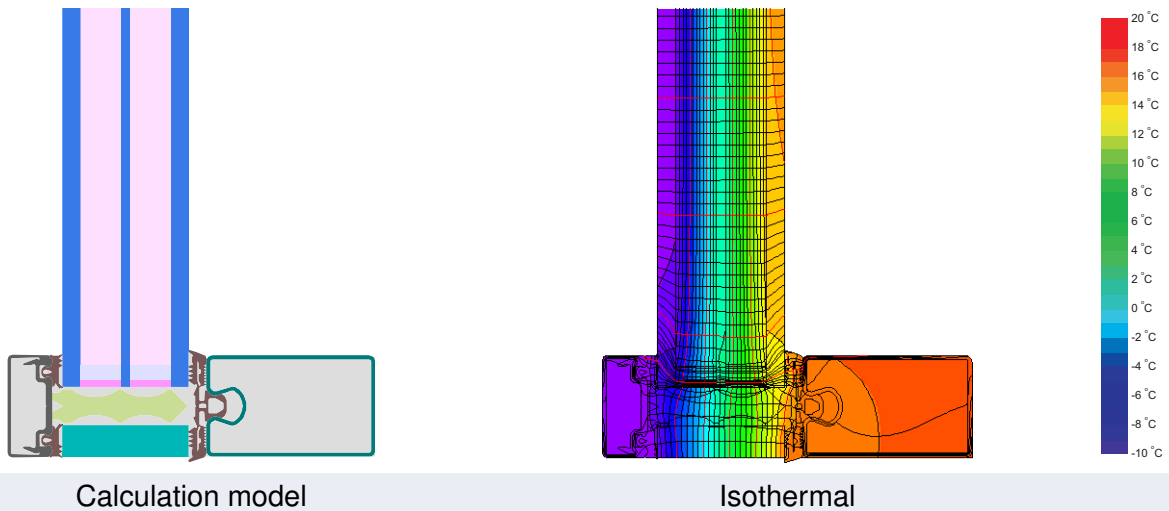
phA

cool, temperate climate



**CERTIFIED
COMPONENT**

Passive House Institute



Description

Steel facade with exterior aluminum cladding and internal screwing duct. Glass carrier and screw losses determined by simulation (PHI). PE-foam rebate insulation (0,038 W/(mK)). Pane thickness: 56 mm (8/18/4/18/8), rebate depth: 14 mm, spacer: SWISSPACER Ultimate.

Explanation

The window U-values were calculated for the test window 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 window U-values will improve as follows:

Glazing	$U_g =$	0.70	0.64	0.58	0.52	W/(m ² K)
		↓	↓	↓	↓	
Element	U_{CW}	0.80	0.75	0.69	0.63	W/(m ² 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.

Frame values			Frame width b_f mm	U -value frame U_f^1 W/(m ² K)	Ψ -glass edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Top fixed	(tof)		45	0.89	0.031	0.80
Side fixed	(sf)		45	0.89	0.031	0.80
Bottom fixed	(bof)		45	0.89	0.031	0.80
Mullion fixed	(m)		45	0.89	0.032	0.80
Transom fixed	(tf)		45	0.89	0.032	0.80
Transom 1 casement	(t1)		106	1.99	0.028	0.73
Spacer: SWISSPACER Ultimate			Secondary seal: Polysulfide			
Thermal glass carrier bridge ² $\chi_{GT} = 0.024$ W/K						

Validated installations

Ventilated facade (fixed glazing)
 $U_{Wall} = 0.13$ W/(m² K)

$\Psi_{install}$	W/(m K)
Top	0.017
Left	0.017
Right	0.017
Bottom	0.015

$U_{W,installed} = 0.83$ W/(m² K)

Exterior insulation and finishing system (EIFS) (fixed glazed)
 $U_{Wall} = 0.13$ W/(m² K)

$\Psi_{install}$	W/(m K)
Top	0.016
Left	0.016
Right	0.016
Bottom	0.015

$U_{W,installed} = 0.83$ W/(m² K)

Cavity wall (fixed glazing)
 $U_{Wall} = 0.13$ W/(m² K)

$\Psi_{install}$	W/(m K)
Top	0.016
Left	0.016
Right	0.016
Bottom	0.016

$U_{W,installed} = 0.83$ W/(m² K)

¹ Includes $\Delta U = 0.30$ W/(m² K). *CWberechnet*

²*CWberechnet* . *CWgctype* : Stainless Steel

