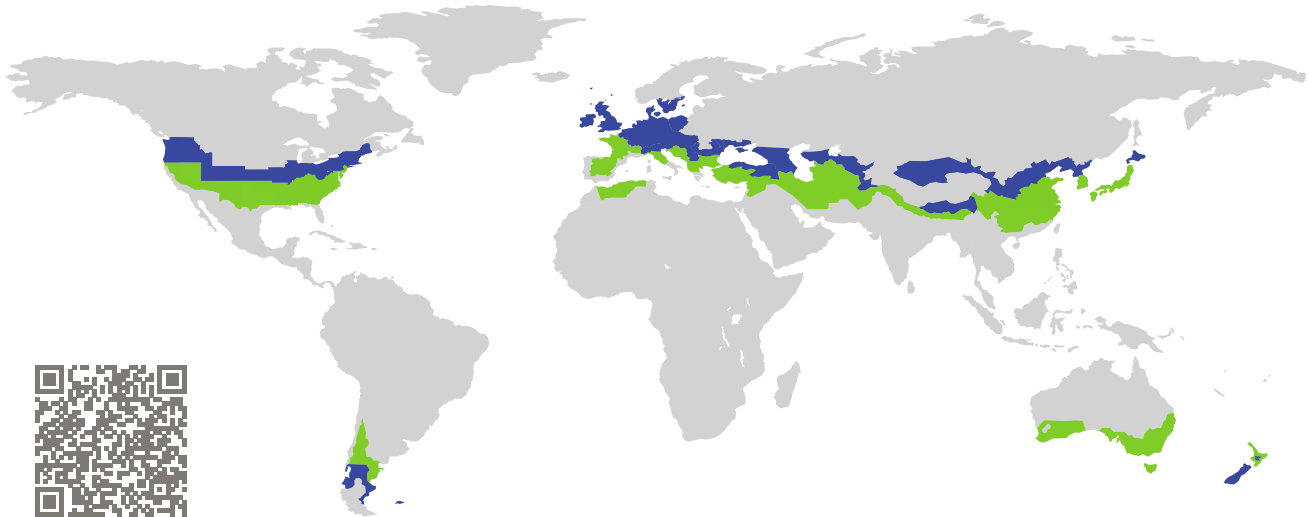


# CERTIFICATE

Certified Passive House Component

Component-ID 0737wi03 valid until 31st December 2017

Passive House Institute  
Dr. Wolfgang Feist  
64283 Darmstadt  
Germany

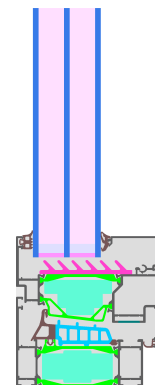


Category: **Window frame**  
Manufacturer: **RAICO Bautechnik GmbH,  
Pfaffenhausen,  
Germany**  
Product name: **FRAME+ 90 WI**

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

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

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



cool, temperate climate



**CERTIFIED  
COMPONENT**

Passive House Institute

Passive House  
efficiency class

phE

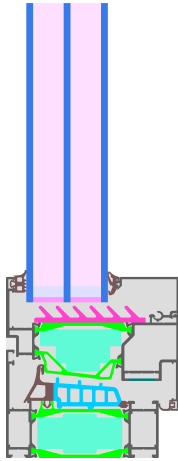
phD

phC

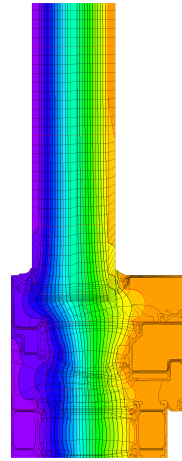
phB

phA

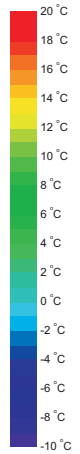
[www.passivehouse.com](http://www.passivehouse.com)



Calculation model



Isothermal



## Description

Thermally separated aluminium window system with Aerogel-high performance insulation (0.016 W/(mK)). Pane thickness: 48 mm (4/18/4/18/4), rebate depth: 15 mm, spacer: SWISSPACER Ultimate

## Explanation





The window U-values were calculated for the test window size of 1.23 m × 1.48 m with  $U_g = 0.70$  W/(m<sup>2</sup> 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 <sup>2</sup> K)
		↓	↓	↓	↓	
Window	$U_W =$	0.80	0.76	0.72	0.67	W/(m <sup>2</sup> K)

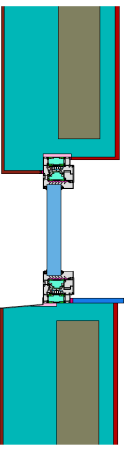
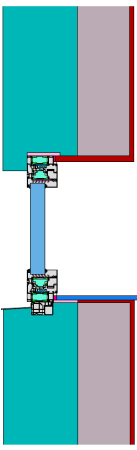
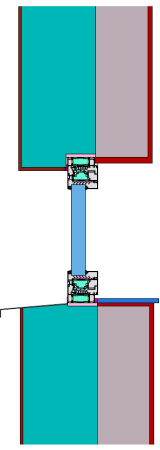
Transparent building components are classified into efficiency classes depending on the heat losses through the opaque part. The frame U-Values, frame widths, thermal bridges at the glazing edge, and the glazing edge lengths are included in these heat losses. A more detailed report of the calculations 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](http://www.passivehouse.com) and [passipedia.org](http://passipedia.org).

Frame values			Frame width $b_f$ mm	$U$ -value frame $U_f$ W/(m <sup>2</sup> K)	$\Psi$ -glass edge $\Psi_g$ W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Top	(to)		107	0.81	0.027	0.78
Side	(s)		107	0.81	0.027	0.78
Bottom	(bo)		107	0.81	0.027	0.78
Mullion 2 casements	(m2)		134	0.83	0.024	0.78
			Spacer: SWISSPACER Ultimate		Secondary seal: Polysulfide	

### Validated installations

Insulated formwork blocks		Ventilated facade (fixed glazing)		EIFS	
					
$\Psi_{install}$	W/(m K)	$\Psi_{install}$	W/(m K)	$\Psi_{install}$	W/(m K)
Top	0.018	Top	0.011	Top	0.016
Side	0.018	Side	0.011	Side	0.016
Bottom	0.020	Bottom	0.048	Bottom	0.022
$U_{W,installed} = 0.85$ W/(m <sup>2</sup> K)		$U_{W,installed} = 0.86$ W/(m <sup>2</sup> K)		$U_{W,installed} = 0.85$ W/(m <sup>2</sup> K)	

