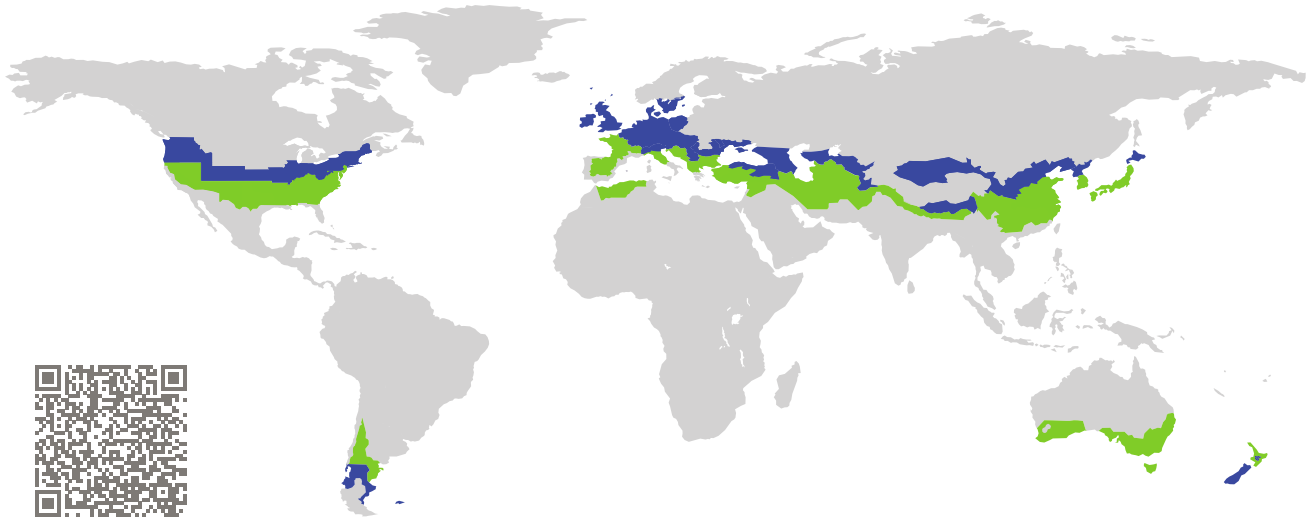


CERTIFICATE

Certified Passive House Component

Component-ID 0784wi03 valid until 31st December 2025

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany

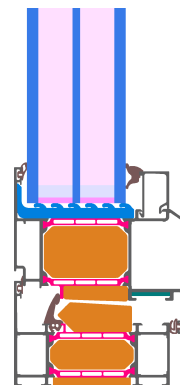


Category: **Window Frame**
Manufacturer: **Kawneer,
Harderwijk,
Netherlands**
Product name: **82mm series RT 82HI+**

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



Passive House
efficiency class

phE

phD

phC

phB

phA

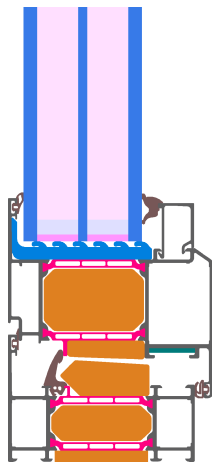
www.passivehouse.com

cool, temperate climate

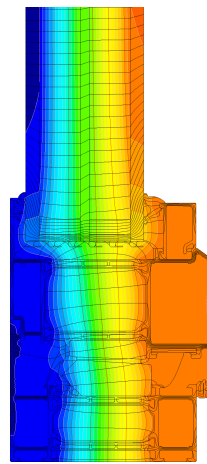


**CERTIFIED
COMPONENT**

Passive House Institute



Calculation model



Isothermal

Description

Thermally separated aluminium frame insulation (0,024 W/(m²K)). Pane thickness: 52 mm (6/18/4/18/6), Rebate depth: 18 mm.

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/(m² K). If a higher quality glazing is used, the window U-values will improve as follows:

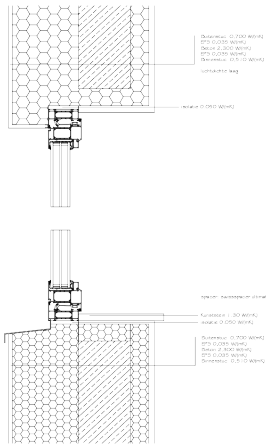
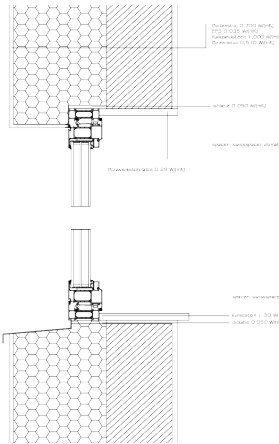
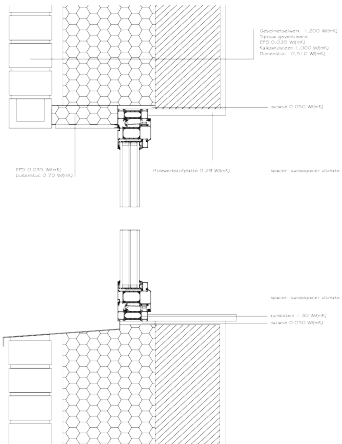
Glazing	$U_g =$	0.70	0.64	0.58	0.54	W/(m ² K)
		↓	↓	↓	↓	
Window	$U_W =$	0.80	0.76	0.72	0.69	W/(m ² K)





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.

Validated installations

Formwork blocks (operable)	Exterior insulation and finishing system (EIFS) (operable)	Cavity wall (operable)
$U_{\text{Wall}} = 0.15 \text{ W/(m}^2 \text{ K)}$	$U_{\text{Wall}} = 0.13 \text{ W/(m}^2 \text{ K)}$	$U_{\text{Wall}} = 0.13 \text{ W/(m}^2 \text{ K)}$
		
Ψ_{install} W/(m K)	Ψ_{install} W/(m K)	Ψ_{install} W/(m K)
Top 0.016	Top 0.014	Top 0.016
Side 0.016	Side 0.014	Side 0.016
Bottom 0.026	Bottom 0.027	Bottom 0.029
$U_{W,\text{installed}} = 0.85 \text{ W/(m}^2 \text{ K)}$	$U_{W,\text{installed}} = 0.85 \text{ W/(m}^2 \text{ K)}$	$U_{W,\text{installed}} = 0.85 \text{ W/(m}^2 \text{ K)}$

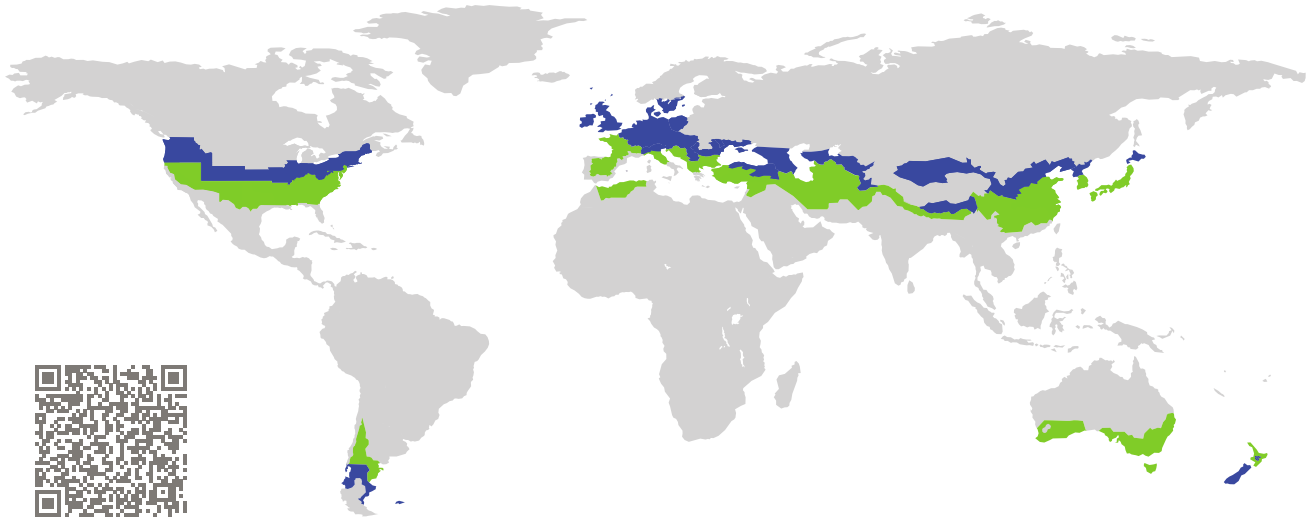
Frame values		Frame width b_f mm	U -value frame U_f W/(m ² K)	Ψ -glazing edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Flying Mulletion (FM1)		138	0.79	0.028	0.76
Bottom (OB1)		116	0.79	0.028	0.77
Top (OH1)		116	0.79	0.028	0.77
Lateral (OJ1)		116	0.79	0.028	0.77
Spacer: SWISSPACER Ultimate			Secondary seal: Polysulfide		

CERTIFICATE

Certified Passive House Component

Component-ID 0724cw03 valid until 31st December 2025

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany



Category: **Curtain Wall**

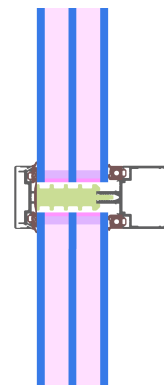
Manufacturer: **Kawneer,
Harderwijk,
Netherlands**

Product name: **AA 100 HI+**

**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

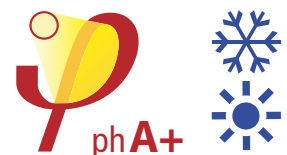
phB

phA

phA+

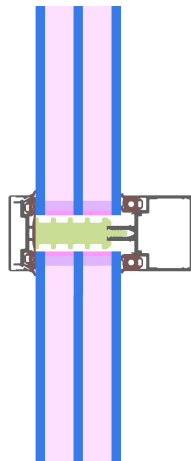
www.passivehouse.com

cool, temperate climate

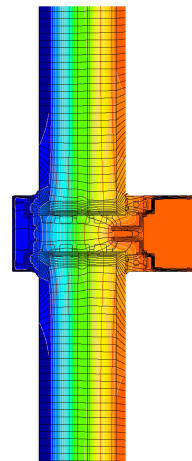


**CERTIFIED
COMPONENT**

Passive House Institute



Calculation model



Isothermal

Description

Aluminium mullion and transom facade, cover- and pressure- strip of aluminium. PE-insulator ($\lambda = 0.038 \text{ W/(mK)}$) inside of the rebate. The losses by the screws have been determined by measurement, the losses caused by the glass carrier by 3D-simulation (PHI). Used Pane: 54 mm (6/18/6/18/6), intersection of the Glass: 14 mm. Used spacer: Swisspacer V. 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 $1.20 \text{ m} \times 2.50 \text{ m}$ with $U_g = 0.70 \text{ W/(m}^2 \text{ K)}$. If a higher quality glazing is used, the element U-values will improve as follows:

Glazing	$U_g =$	0.70	0.64	0.53	0.48	$\text{W/(m}^2 \text{ K)}$
		↓	↓	↓	↓	
Element	U_{CW}	0.79	0.73	0.63	0.58	$\text{W/(m}^2 \text{ K)}$

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	0.82	0.032	0.81
Transom fixed	(0T1)		50	0.82	0.032	0.81
Bottom fixed	(FB1)		50	0.82	0.032	0.81
Top fixed	(FH1)		50	0.82	0.032	0.81
Lateral fixed	(FJ1)		50	0.82	0.032	0.81
Spacer: SWISSPACER V			Secondary seal: Polysulfide			

Thermal glass carrier bridge² $\chi_{GT} = 0.003$ W/K

Validated installations

Lightweight timber (fixed glazed)		Ventilated facade (fixed glazing)		Exterior insulation and finishing system (EIFS) (fixed glazed)	
					
$\Psi_{install}$	W/(m K)	$\Psi_{install}$	W/(m K)	$\Psi_{install}$	W/(m K)
Top	0.050	Top	0.040	Top	0.040
Left	0.050	Left	0.037	Left	0.037
Right	0.050	Right	0.037	Right	0.037
Bottom	0.050	Bottom	0.040	Bottom	0.040
$U_{W,installed} = 0.85$ W/(m ² K)		$U_{W,installed} = 0.84$ W/(m ² K)		$U_{W,installed} = 0.84$ W/(m ² K)	

¹ Includes $\Delta U = 0.15$ W/(m² K). Determined through measurement

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

