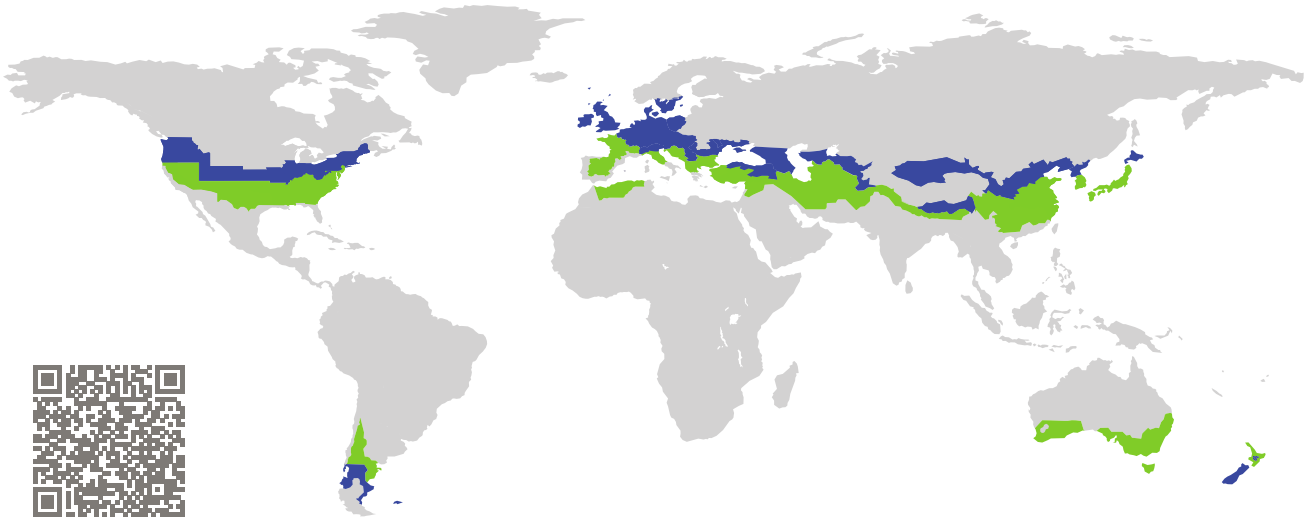
CERTIFICATE

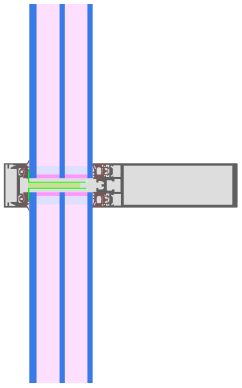
Certified Passive House Component

Component-ID 0735cw03 valid until 31st December 2017

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany



Category:	**Curtain Wall**
Manufacturer:	**SCHÜCO International KG, Bielefeld, Germany**
Product name:	**FWS 35 PD.SI**



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

Comfort	U_{CW} = 0.80	≤	0.80 W/(m² K)
	$U_{CW,installed}$	≤	0.85 W/(m² K)
	with U_g	=	0.70 W/(m² K)
Hygiene	$f_{Rsi=0.25}$	≥	0.70

cool, temperate climate

phA

CERTIFIED COMPONENT

Passive House Institute

Passive House efficiency class	phE	phD	phC	phB	phA

www.passivehouse.com

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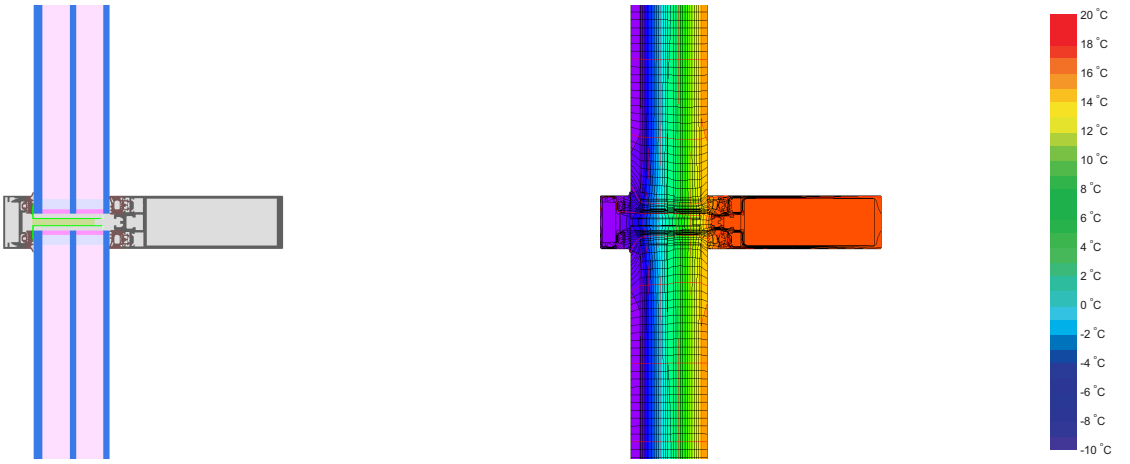


Calculation model | Isothermal

Description

Aluminum curtain wall, insulated by PE-foam (0,038 W/(m²K). Reduction of the radiation losses by low emmissivity aluminum tape (e=5%). Losses by screws and glass carrier were determined by 3d-thermal flux analysis (PHI). Pane thickness: 50 mm (6/18/4/18/4), rebate depth: 12 mm, spacer: SWISSPACER Ultimate

Explanation

The element U-values were calculated for the test element size of 1.20 m × 2.50 m with U_g = 0.70 W/(m² 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	W/(m² K)
		↓	↓	↓	↓	
Element	U_{CW}	0.80	0.74	0.64	0.59	W/(m² 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.

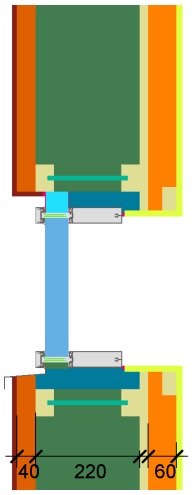
The Passive House Institute has defined international component criteria for seven climate zones. In principle, components which have been certified for climate zones with higher requirements may also be used in climates with less stringent requirements. In a particular climate zone it may make sense 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/(m² K)	Ψ-glass edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Top fixed	(tof)	35	0.96	0.034	0.82
Side fixed	(sf)	35	0.96	0.032	0.82
Bottom fixed	(bof)	35	0.96	0.034	0.82
Mullion fixed	(m)	35	0.96	0.032	0.82
Transom fixed	(tf)	35	0.96	0.034	0.82
Transom 1 casement	(t1)	142	1.20	0.028	0.82
Spacer: SWISSPACER Ultimate			Secondary seal: Polysulfide		
Thermal glass carrier bridge [2] χ_{GT} = 0.015 W/K					

Validated installations

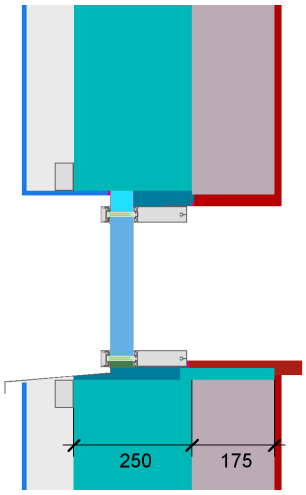
Lighthweight timber (fixed glazed)



$\Psi_{install}$	W/(m K)
Top	0.042
Left	0.042
Right	0.042
Bottom	0.041

$U_{W,installed}$ = 0.86 W/(m² K)

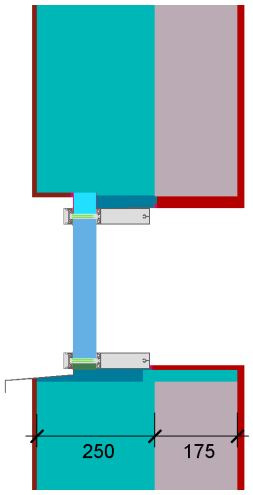
Ventilated facade (fixed glazing)



$\Psi_{install}$	W/(m K)
Top	0.030
Left	0.030
Right	0.030
Bottom	0.031

$U_{W,installed}$ = 0.84 W/(m² K)

Exterior insulation and finishing system (EIFS) (fixed glazed)



$\Psi_{install}$	W/(m K)
Top	0.029
Left	0.029
Right	0.029
Bottom	0.031

$U_{W,installed}$ = 0.84 W/(m² K)

[1] Includes ΔU = 0.25 W/(m² K). Determined through 3D - FEM Simulation
[2] Determined through 3D - FEM Simulation . Glas support type : Non-Metallic Glass Carrier with Screws