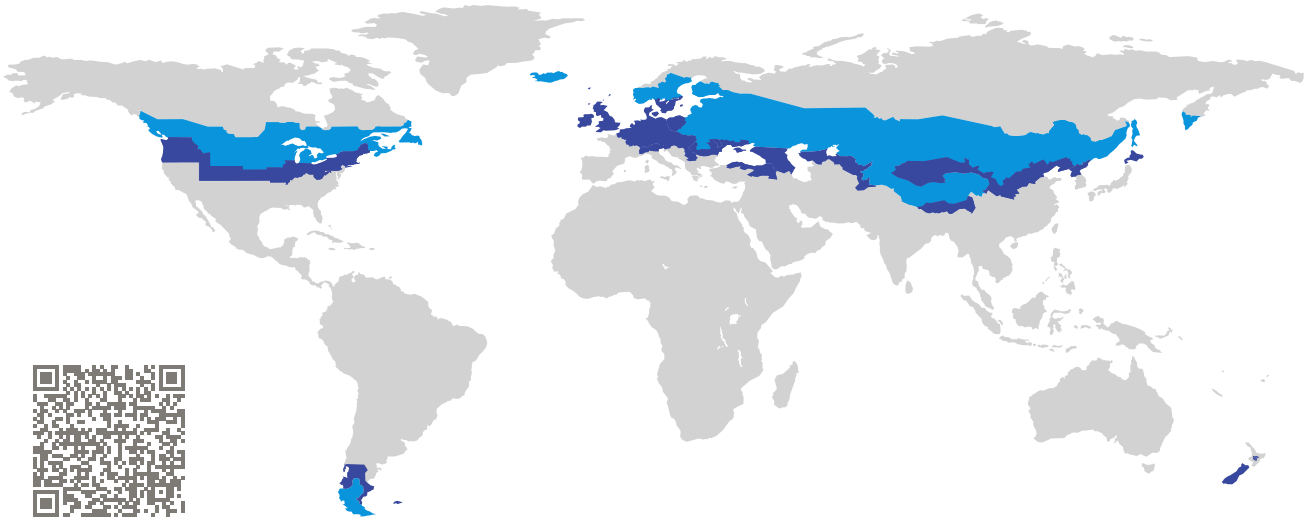
CERTIFICATE

Certified Passive House Component

Component-ID 1194ws02 valid until 31st December 2025

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany



Category: **Window system**

Manufacturer: **ENERsign GmbH, Wittlich, Germany**

Product name: **ENERsign primus**

This certificate was awarded based on the following criteria for the cold climate zone

Comfort	U_W = 0.60	≤	0.60 W/(m² K)
	$U_{W,\text{installed}}$	≤	0.65 W/(m² K)
	with U_g	=	0.52 W/(m² K)
Hygiene	$f_{Rsi=0.25}$	≥	0.75
Airtightness	Q_{100} = 0.16	≤	0.25 m³/(h m)

cold climate

phA

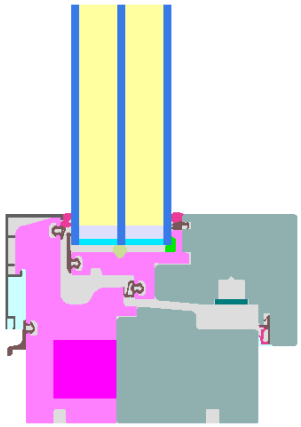
CERTIFIED COMPONENT

Passive House Institute

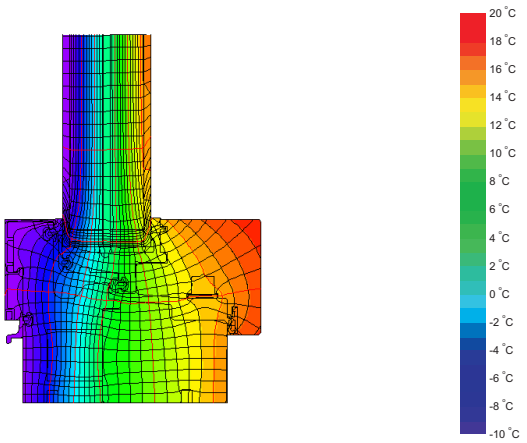
Passive House efficiency class	phE	phD	phC	phB	phA

www.passivehouse.com

ENERsign GmbH
Dr. Oetker Straße 28, 54516 Wittlich, Germany
☎ +49 6571 95398-0 | ✉ info@enersign.com | http://www.enersign.com |



Calculation model



Isothermal

Description

Aluminium cladded timber frame (0,11 W/(mK)), insulated by ENERcell (0,06 W/(mK)) and EPS-Foam (0,032 W/(mK)). Q100 = 0,16 m³/(hm) testet at a window with flying mullion Stulpfenster (2,26 * 2,51 m). Pane thickness: 48 mm (4/18/4/18/4), rebate depth: 15 mm, spacer: SWISSPACER Ultimate with polyurethane as secondary seal. At the side-section with handle the temperature factor for the cold climate is not achieved. Never the less, this values are much better than usual.

Explanation

The window U-values were calculated for the test window size of 2.46 m × 1.48 m with U_g = 0.52 W/(m² K). If a higher quality glazing is used, the window U-values will improve as follows:

Glazing	U_g =	0.52	0.70	0.61	0.35	W/(m² K)
		↓	↓	↓	↓	
Window	U_W =	0.60	0.74	0.67	0.47	W/(m² K)

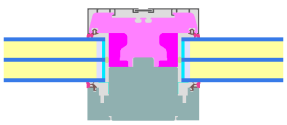
Transparent building components are classified into efficiency classes depending on the heat losses through the opaque part. The frame U-Values, frame widths, thermal bridges at the glazing edge, and the glazing edge lengths are included in these heat losses. A more detailed report of the calculations 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.

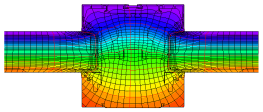
Further information relating to certification
can be found on www.passivehouse.com and passipedia.org.

Frame values		Frame width b_f mm	U-value frame U_f W/(m² K)	Ψ-glazing edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Mullion fixed	(0M1)	120	0.58	0.019	0.78
Transom fixed	(0T1)	120	0.61	0.019	0.78
Mullion 1 casement	(1M1)	120	0.63	0.020	0.77
Transom 1 casement	(1T1)	120	0.66	0.020	0.77
Corner	(CO1)	342	0.31	0.019	0.75
door side	(DS1)	171	0.70	0.022	0.74
Bottom fixed	(FB1)	100	0.61	0.019	0.78
Top fixed	(FH1)	100	0.58	0.019	0.78
Lateral fixed	(FJ1)	100	0.58	0.019	0.78
Flying Mullion	(FM1)	100	0.65	0.020	0.77
Bottom	(OB1)	100	0.64	0.020	0.77
Top	(OH1)	100	0.64	0.020	0.77
Lateral	(OJ1)	100	0.64	0.020	0.77
Threshold	(OT2)	100	1.09	0.022	0.71
Spacer: SWISSPACER Ultimate			Secondary seal: Polyurethan		

Mullion
fixed

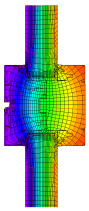
b_f = 120 mm
U_f = 0.58 W/(m² K)
Ψ_g = 0.019 W/(m K)
f_{Rsi} = 0.78





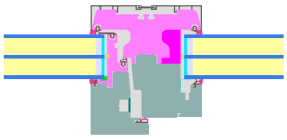
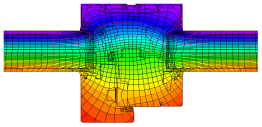
Transom
fixed

b_f = 120 mm
U_f = 0.61 W/(m² K)
Ψ_g = 0.019 W/(m K)
f_{Rsi} = 0.78

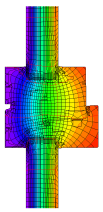
Mullion
1 casement

b_f = 120 mm
U_f = 0.63 W/(m² K)
Ψ_g = 0.020 W/(m K)
f_{Rsi} = 0.77

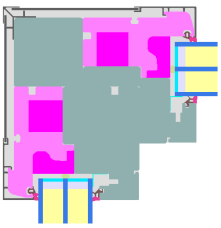
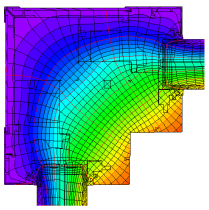
Transom
1 casement

b_f = 120 mm
U_f = 0.66 W/(m² K)
Ψ_g = 0.020 W/(m K)
f_{Rsi} = 0.77

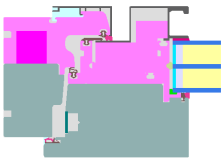
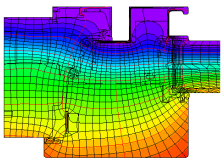
Corner

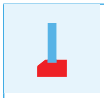
b_f = 342 mm
U_f = 0.31 W/(m² K)
Ψ_g = 0.019 W/(m K)
f_{Rsi} = 0.75

door side

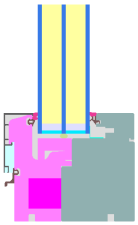
b_f = 171 mm
U_f = 0.70 W/(m² K)
Ψ_g = 0.022 W/(m K)
f_{Rsi} = 0.74

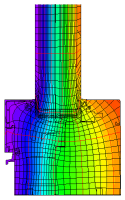





Bottom
fixed

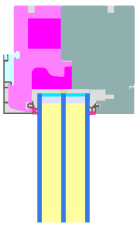
b_f = 100 mm
U_f = 0.61 W/(m² K)
Ψ_g = 0.019 W/(m K)
f_{Rsi} = 0.78

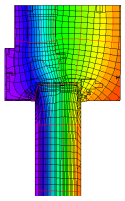


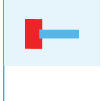


Top
fixed

b_f = 100 mm
U_f = 0.58 W/(m² K)
Ψ_g = 0.019 W/(m K)
f_{Rsi} = 0.78

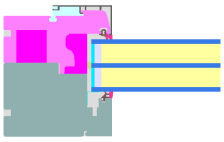


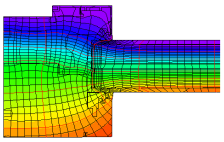




Lateral
fixed

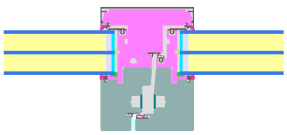
b_f = 100 mm
U_f = 0.58 W/(m² K)
Ψ_g = 0.019 W/(m K)
f_{Rsi} = 0.78

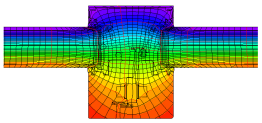




Flying Mullion

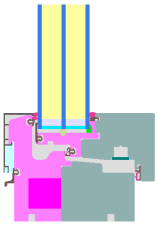
b_f = 100 mm
U_f = 0.65 W/(m² K)
Ψ_g = 0.020 W/(m K)
f_{Rsi} = 0.77

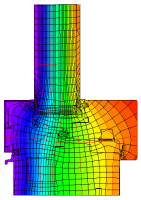




Bottom

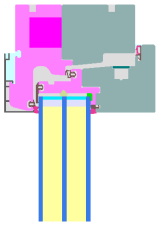
b_f = 100 mm
U_f = 0.64 W/(m² K)
Ψ_g = 0.020 W/(m K)
f_{Rsi} = 0.77

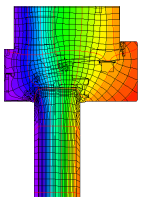




Top

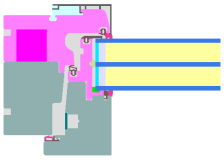
b_f = 100 mm
U_f = 0.64 W/(m^2 K)
Ψ_g = 0.020 W/(m K)
f_{Rsi} = 0.77

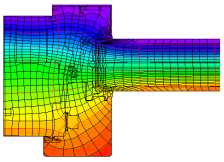




Lateral

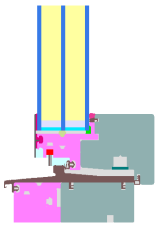
b_f = 100 mm
U_f = 0.64 W/(m^2 K)
Ψ_g = 0.020 W/(m K)
f_{Rsi} = 0.77

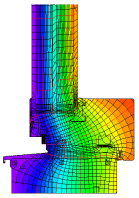




Threshold

b_f = 100 mm
U_f = 1.09 W/(m^2 K)
Ψ_g = 0.022 W/(m K)
f_{Rsi} = 0.71

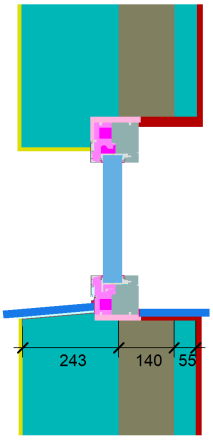




Validated installations

Formwork blocks (fixed)

U_{Wall} = 0.11 W/(m² K)

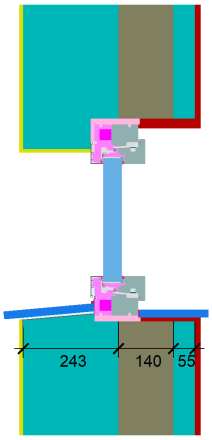


$\Psi_{install}$	W/(m K)
Top	0.110
Left	0.002
Right	0.002
Bottom	0.029

$U_{W,installed}$ = 0.70 W/(m² K)

Formwork blocks (operable)

U_{Wall} = 0.11 W/(m² K)

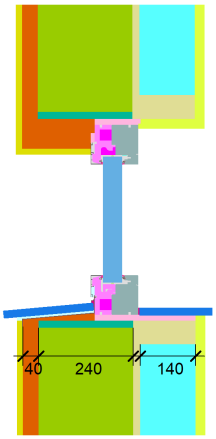


$\Psi_{install}$	W/(m K)
Top	0.011
Left	0.000
Right	0.000
Bottom	0.029

$U_{W,installed}$ = 0.63 W/(m² K)

Lightweight timber (fixed glazed)

U_{Wall} = 0.10 W/(m² K)

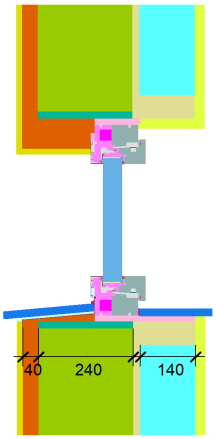


$\Psi_{install}$	W/(m K)
Top	0.015
Left	0.011
Right	0.011
Bottom	0.030

$U_{W,installed}$ = 0.64 W/(m² K)

Lightweight timber (operable)

U_{Wall} = 0.10 W/(m² K)

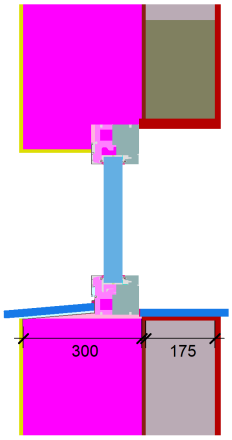


$\Psi_{install}$	W/(m K)
Top	0.015
Left	0.008
Right	0.008
Bottom	0.030

$U_{W,installed}$ = 0.64 W/(m² K)

Exterior insulation and finishing s (EIFS) top (fixed glazing))

U_{Wall} = 0.10 W/(m² K)

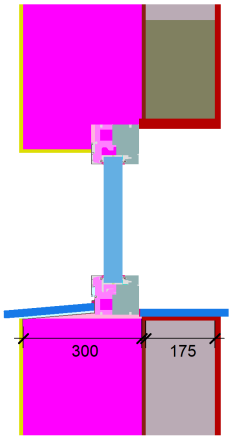


$\Psi_{install}$	W/(m K)
Top	–0.002
Left	0.000
Right	0.000
Bottom	0.011

$U_{W,installed}$ = 0.61 W/(m² K)

Exterior insulation and finishing system (EIFS) (operable)

U_{Wall} = 0.10 W/(m² K)

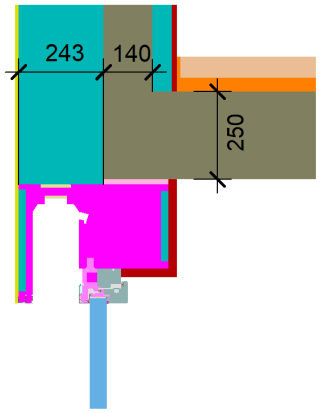


$\Psi_{install}$	W/(m K)
Top	–0.002
Left	–0.002
Right	–0.002
Bottom	0.011

$U_{W,installed}$ = 0.60 W/(m² K)

Formwork blocks - top (operable) with shutter 1

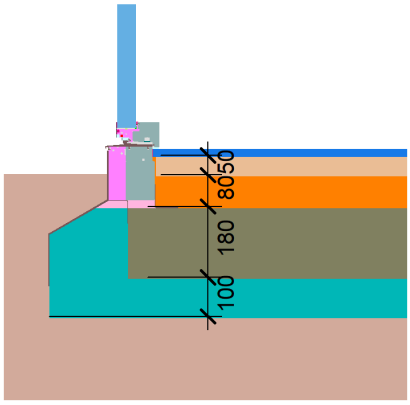
U_1 = 0.11 [W/(m² K)]



$\Psi_{install}$ = 0.02 W/(m K)

Formwork blocks - threshold (operable)

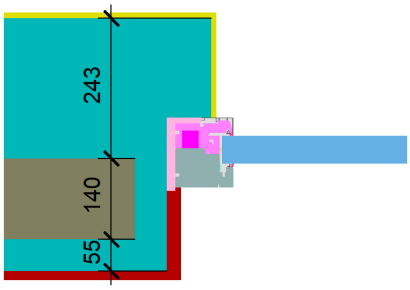
U_1 = 0.11 U_2 = 0.20 [W/(m² K)]



$\Psi_{install}$ = 0.03 W/(m K)

Formwork blocks side (fixed)

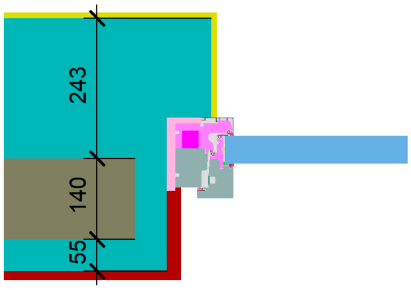
U_1 = 0.11 [W/(m² K)]



$\Psi_{install}$ = 0.00 W/(m K)

Formwork blocks side (operable)

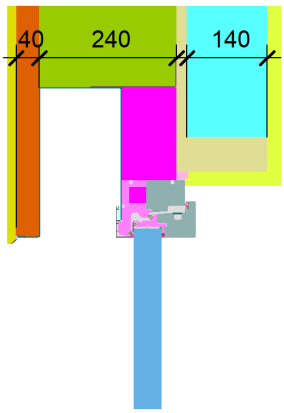
U_1 = 0.11 [W/(m² K)]



$\Psi_{install}$ = 0.00 W/(m K)

Lighthweight timber top (operable) with shutter 1

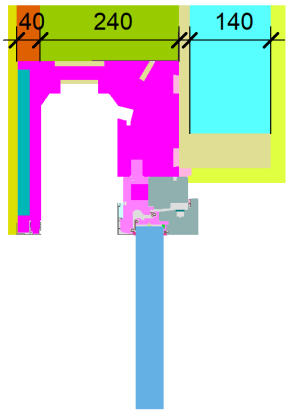
U_1 = 0.10 [W/(m² K)]



$\Psi_{install}$ = 0.03 W/(m K)

Lighthweight timber top (operable) with shutter 2

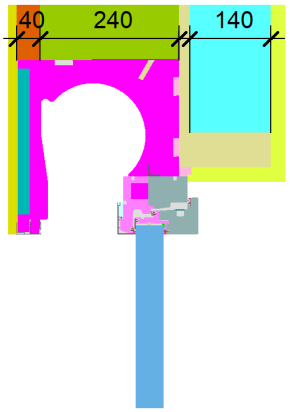
U_1 = 0.10 [W/(m² K)]



$\Psi_{install}$ = 0.03 W/(m K)

Lighthweight timber top (operable) with roller 1

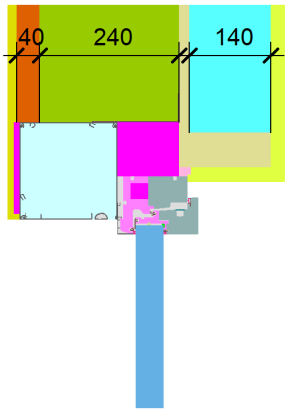
U_1 = 0.10 [W/(m² K)]



$\Psi_{install}$ = 0.05 W/(m K)

Lighthweight timber top (operable) with roller 2

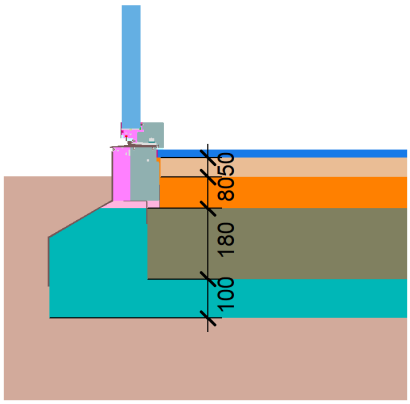
U_1 = 0.10 [W/(m² K)]



$\Psi_{install}$ = 0.02 W/(m K)

Lighthweight timber - threshold (operable)

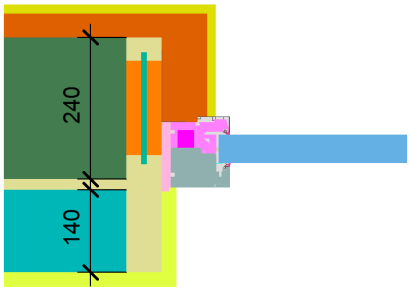
U_1 = 0.10 U_2 = 0.20 [W/(m² K)]



$\Psi_{install}$ = 0.04 W/(m K)

Lighthweight timber side (fixed glazed)

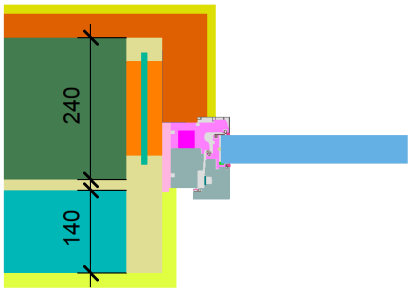
U_1 = 0.10 [W/(m² K)]



$\Psi_{install}$ = 0.01 W/(m K)

Lighthweight timber side (operable)

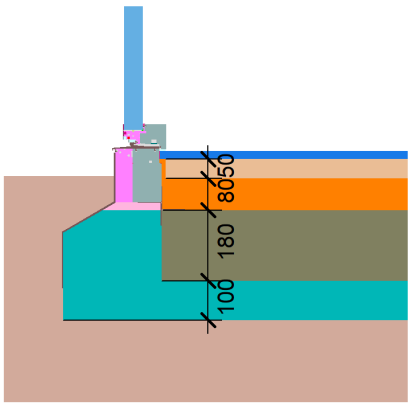
U_1 = 0.10 [W/(m² K)]



$\Psi_{install}$ = 0.01 W/(m K)

Exterior insulation and finishing s (EIFS) threshold (operable)

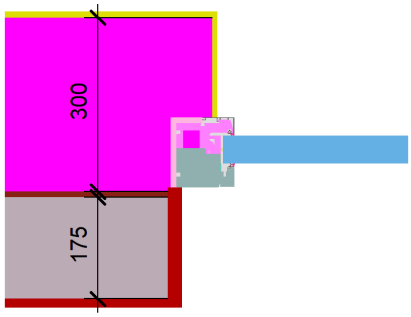
U_1 = 0.10 U_2 = 0.20 [W/(m² K)]



$\Psi_{install}$ = −0.01 W/(m K)

Exterior insulation and finishing s (EIFS) side (fixed glazed)

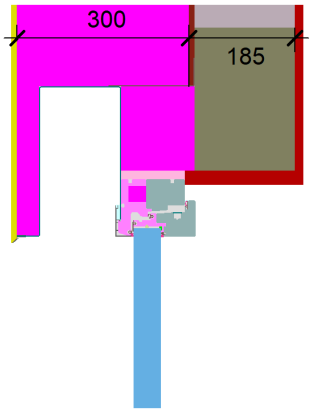
U_1 = 0.10 [W/(m² K)]



$\Psi_{install}$ = 0.00 W/(m K)

EIFS top (operable) with shutter 1

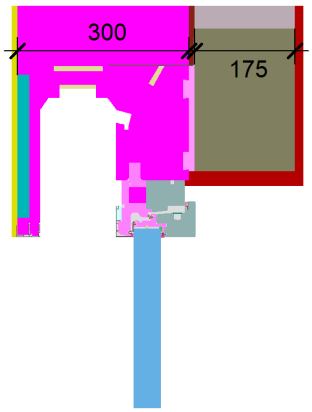
U_1 = 0.10 [W/(m² K)]



$\Psi_{install}$ = 0.04 W/(m K)

EIFS top (operable) with shutter 2

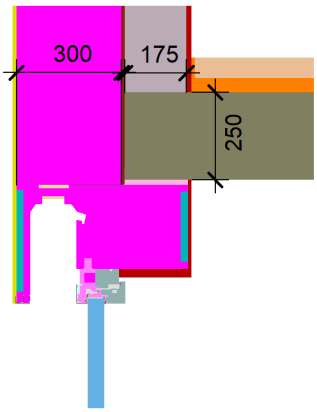
U_1 = 0.10 [W/(m² K)]



$\Psi_{install}$ = 0.04 W/(m K)

EIFS top (operable) with shutter 3

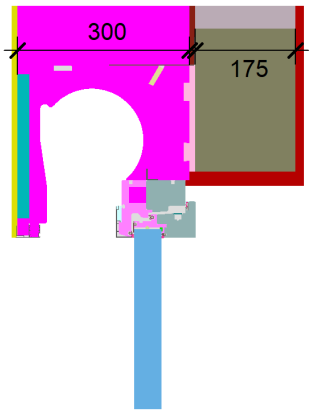
U_1 = 0.10 [W/(m² K)]



$\Psi_{install}$ = 0.03 W/(m K)

EIFS top (operable) with rollerblind 1

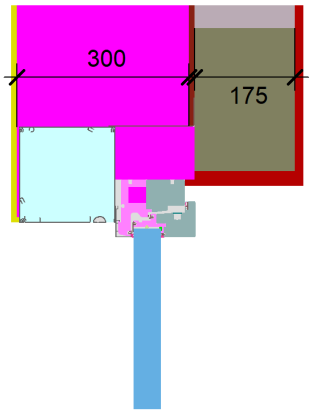
U_1 = 0.10 [W/(m² K)]



$\Psi_{install}$ = 0.06 W/(m K)

EIFS top (operable) with rollerblind 2

U_1 = 0.10 [W/(m² K)]



$\Psi_{install}$ = 0.02 W/(m K)