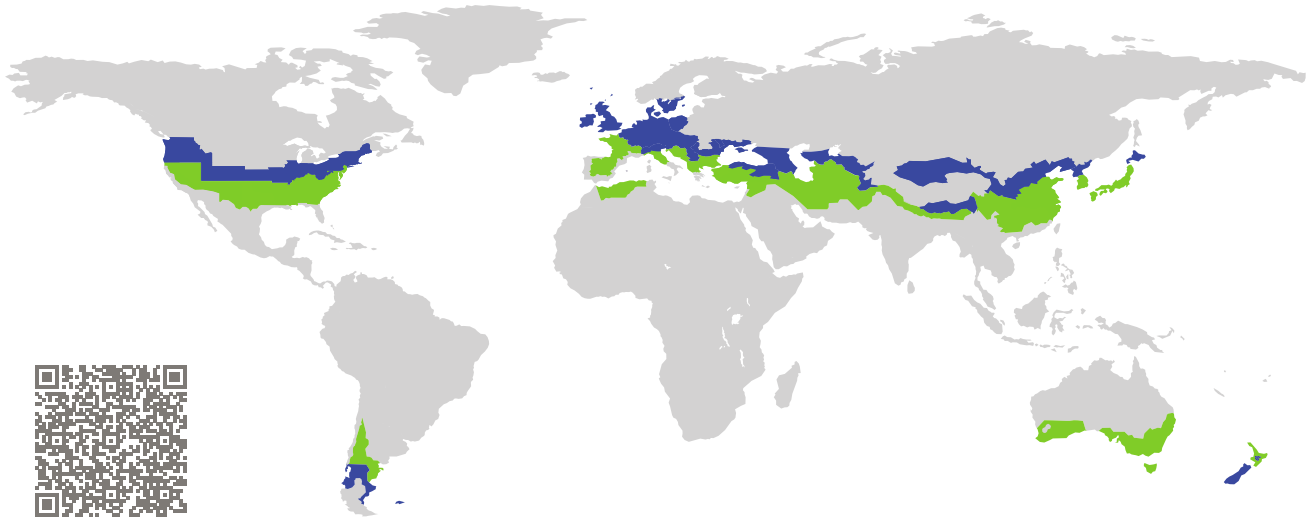


CERTIFICATE

Certified Passive House Component

Component-ID 1543ws03 valid until 31st December 2025

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany



Category: **Window system**
Manufacturer: **aluplast GmbH,
Karlsruhe,
Germany**
Product name: **aluplast energeto 8000 foam inside**

**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 $f_{Rsi=0.25} \geq 0.70$
Airtightness $Q_{100} = 0.24 \leq 0.25 \text{ m}^3/(\text{h m})$



Passive House
efficiency class

phE

phD

phC

phB

phA

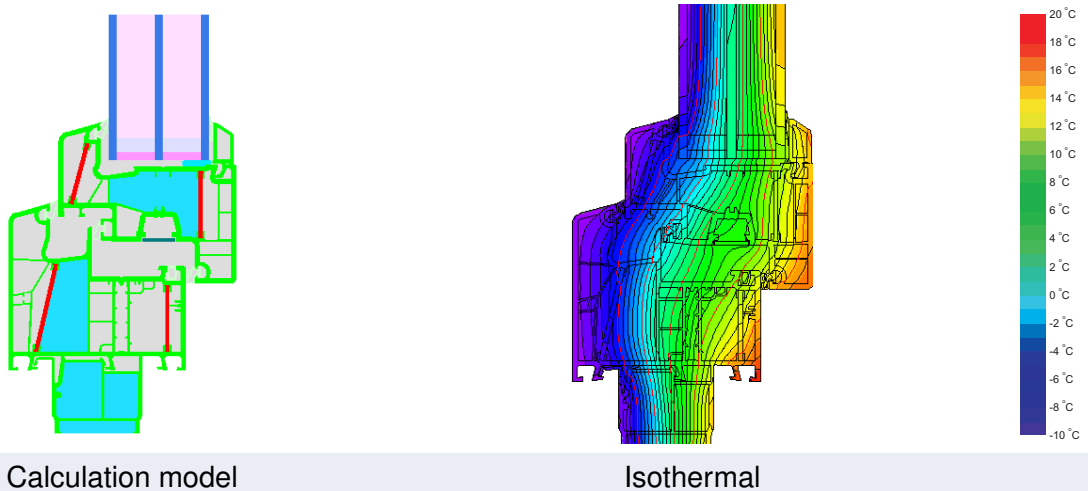
www.passivehouse.com

cool, temperate climate



**CERTIFIED
COMPONENT**

Passive House Institute



Calculation model Isothermal

Description

Vinyl window frame, insulated by PU-foam (0,030 W/(mK)), reinforced by Polyamide with 25% glassfibre (0,30 W/(mK)). Note: At some not installed frame sections the temperature factor is not achieved. That might lead to hygienic suboptimal conditions in case of very low exterior temperatures. Pane thickness: 48 mm (4/18/4/18/4), rebate depth: 16 mm, spacer: SWISSPACER Ultimate. Maximum size of sash: 1.10 * 2.05 m laminated in any colour and 1.14 * 2.15 m white.

Explanation

The window U-values were calculated for the test window size of 2.46 m × 1.48 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) |
| | | ↓ | ↓ | ↓ | ↓ | |
| Window | $U_w =$ | 0.80 | 0.76 | 0.72 | 0.68 | 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 W/(m ² K) | Ψ -glazing edge Ψ_g W/(m K) | Temp. Factor $f_{Rsi=0.25}$ [-] |
|---------------------|-------|--|----------------------------|---|---|---------------------------------------|
| Mullion fixed | (0M1) | | 104 | 1.01 | 0.026 | 0.74 |
| Transom fixed | (0T1) | | 104 | 1.01 | 0.026 | 0.74 |
| Mullion 1 casement | (1M1) | | 143 | 0.95 | 0.026 | 0.69 |
| Transom 1 casement | (1T1) | | 143 | 0.95 | 0.026 | 0.69 |
| Mullion 2 casements | (2M1) | | 181 | 0.94 | 0.026 | 0.67 |
| Transom 2 casements | (2T1) | | 181 | 0.94 | 0.026 | 0.67 |
| Bottom fixed | (FB1) | | 110 | 0.81 | 0.027 | 0.76 |
| Top fixed | (FH1) | | 80 | 0.71 | 0.027 | 0.75 |
| Lateral fixed | (FJ1) | | 80 | 0.71 | 0.027 | 0.75 |
| Flying Mullion | (FM2) | | 162 | 0.86 | 0.026 | 0.63 |
| Flying Mullion | (FM3) | | 142 | 0.94 | 0.026 | 0.58 |
| Flying Mullion | (FM4) | | 126 | 0.83 | 0.027 | 0.65 |
| Bottom | (OB1) | | 149 | 0.86 | 0.027 | 0.76 |
| Top | (OH1) | | 119 | 0.80 | 0.027 | 0.76 |
| Lateral | (OJ1) | | 119 | 0.80 | 0.027 | 0.76 |
| Threshold | (OT3) | | 89 | 1.44 | 0.026 | 0.43 |
| Threshold | (OT4) | | 82 | 1.53 | 0.026 | 0.73 |
| Threshold | (OT5) | | 82 | 1.35 | 0.023 | 0.73 |

Spacer: SWISSPACER ULTIMATE

Secondary seal: Polysulfide

Mullion fixed

$b_f = 104$ mm

$U_f = 1.01$ W/(m² K)

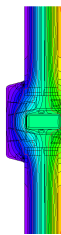
$\Psi_g = 0.026$ W/(m K)

$f_{Rsi} = 0.74$



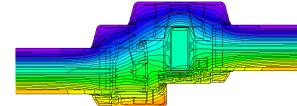
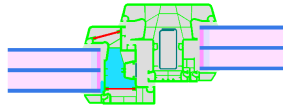
Transom
fixed

$b_f = 104 \text{ mm}$
 $U_f = 1.01 \text{ W}/(\text{m}^2 \text{ K})$
 $\Psi_g = 0.026 \text{ W}/(\text{m K})$
 $f_{Rsi} = 0.74$



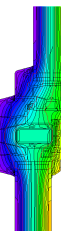
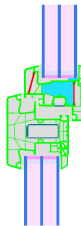
Mullion
1 casement

$b_f = 143 \text{ mm}$
 $U_f = 0.95 \text{ W}/(\text{m}^2 \text{ K})$
 $\Psi_g = 0.026 \text{ W}/(\text{m K})$
 $f_{Rsi} = 0.69$



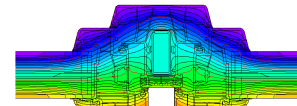
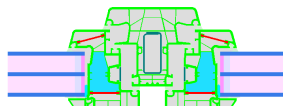
Transom
1 casement

$b_f = 143 \text{ mm}$
 $U_f = 0.95 \text{ W}/(\text{m}^2 \text{ K})$
 $\Psi_g = 0.026 \text{ W}/(\text{m K})$
 $f_{Rsi} = 0.69$



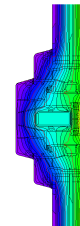
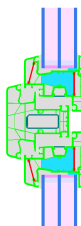
Mullion
2 casements

$b_f = 181 \text{ mm}$
 $U_f = 0.94 \text{ W}/(\text{m}^2 \text{ K})$
 $\Psi_g = 0.026 \text{ W}/(\text{m K})$
 $f_{Rsi} = 0.67$



Transom
2 casements

$b_f = 181 \text{ mm}$
 $U_f = 0.94 \text{ W}/(\text{m}^2 \text{ K})$
 $\Psi_g = 0.026 \text{ W}/(\text{m K})$
 $f_{Rsi} = 0.67$





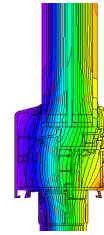
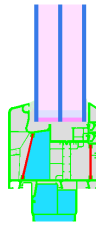
Bottom
fixed

$$b_f = 110 \text{ mm}$$

$$U_f = 0.81 \text{ W/(m}^2 \text{ K)}$$

$$\Psi_g = 0.027 \text{ W/(m K)}$$

$$f_{Rsi} = 0.76$$



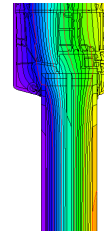
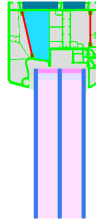
Top
fixed

$$b_f = 80 \text{ mm}$$

$$U_f = 0.71 \text{ W/(m}^2 \text{ K)}$$

$$\Psi_g = 0.027 \text{ W/(m K)}$$

$$f_{Rsi} = 0.75$$



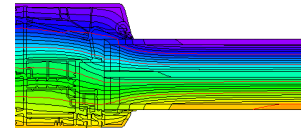
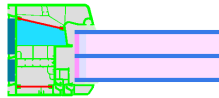
Lateral
fixed

$$b_f = 80 \text{ mm}$$

$$U_f = 0.71 \text{ W/(m}^2 \text{ K)}$$

$$\Psi_g = 0.027 \text{ W/(m K)}$$

$$f_{Rsi} = 0.75$$



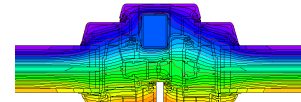
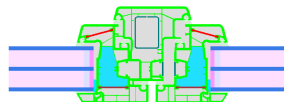
Flying Mullion

$$b_f = 162 \text{ mm}$$

$$U_f = 0.86 \text{ W/(m}^2 \text{ K)}$$

$$\Psi_g = 0.026 \text{ W/(m K)}$$

$$f_{Rsi} = 0.63$$



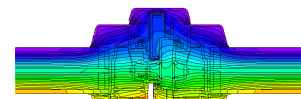
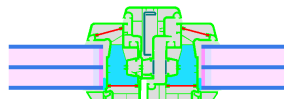
Flying Mullion

$$b_f = 142 \text{ mm}$$

$$U_f = 0.94 \text{ W/(m}^2 \text{ K)}$$

$$\Psi_g = 0.026 \text{ W/(m K)}$$

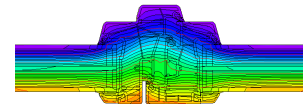
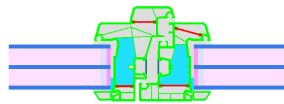
$$f_{Rsi} = 0.58$$





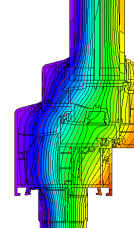
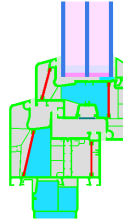
Flying Mullion

$b_f = 126 \text{ mm}$
 $U_f = 0.83 \text{ W/(m}^2 \text{ K)}$
 $\Psi_g = 0.027 \text{ W/(m K)}$
 $f_{Rsi} = 0.65$



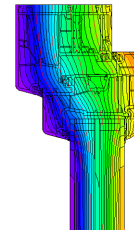
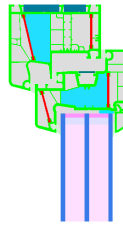
Bottom

$b_f = 149 \text{ mm}$
 $U_f = 0.86 \text{ W/(m}^2 \text{ K)}$
 $\Psi_g = 0.027 \text{ W/(m K)}$
 $f_{Rsi} = 0.76$



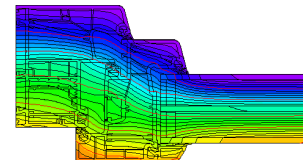
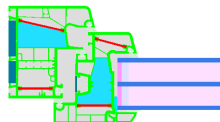
Top

$b_f = 119 \text{ mm}$
 $U_f = 0.80 \text{ W/(m}^2 \text{ K)}$
 $\Psi_g = 0.027 \text{ W/(m K)}$
 $f_{Rsi} = 0.76$



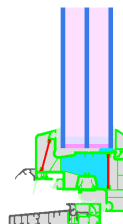
Lateral

$b_f = 119 \text{ mm}$
 $U_f = 0.80 \text{ W/(m}^2 \text{ K)}$
 $\Psi_g = 0.027 \text{ W/(m K)}$
 $f_{Rsi} = 0.76$



Threshold

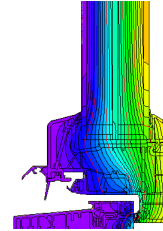
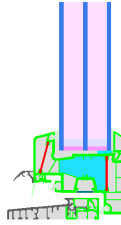
$b_f = 89 \text{ mm}$
 $U_f = 1.44 \text{ W/(m}^2 \text{ K)}$
 $\Psi_g = 0.026 \text{ W/(m K)}$
 $f_{Rsi} = 0.43$





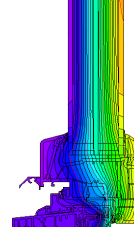
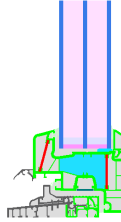
Threshold

$$b_f = 82 \text{ mm}$$
$$U_f = 1.53 \text{ W}/(\text{m}^2 \text{ K})$$
$$\Psi_g = 0.026 \text{ W}/(\text{m K})$$
$$f_{Rsi} = 0.73$$

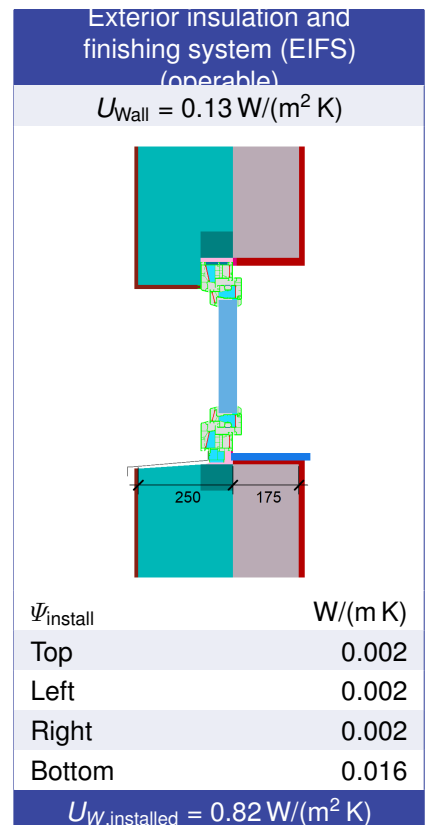
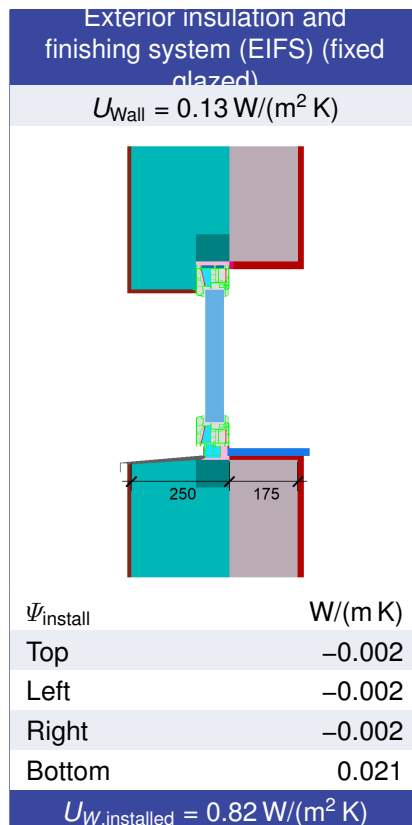
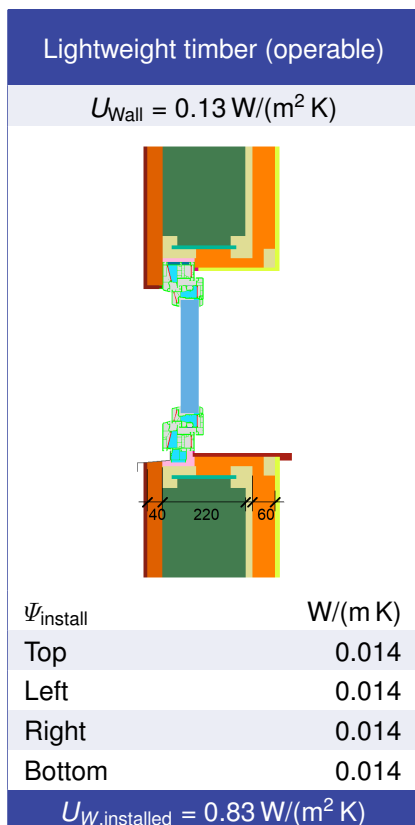
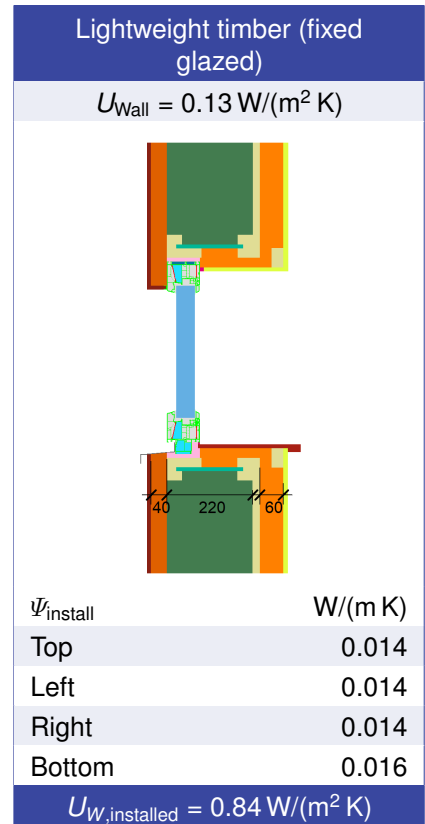
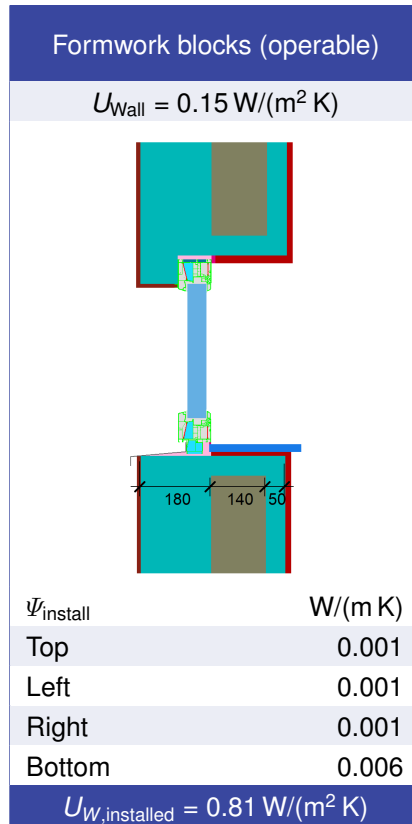
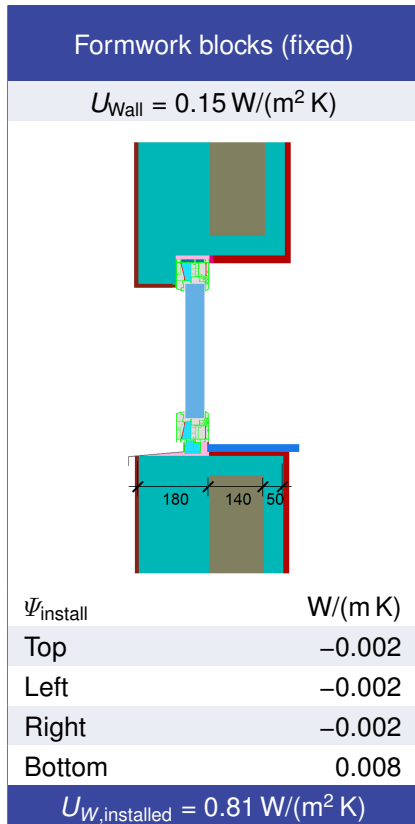


Threshold

$$b_f = 82 \text{ mm}$$
$$U_f = 1.35 \text{ W}/(\text{m}^2 \text{ K})$$
$$\Psi_g = 0.023 \text{ W}/(\text{m K})$$
$$f_{Rsi} = 0.73$$

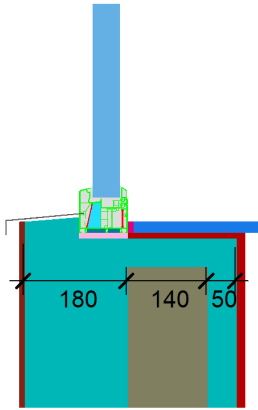


Validated installations



Formwork blocks bottom 2 (fixed)

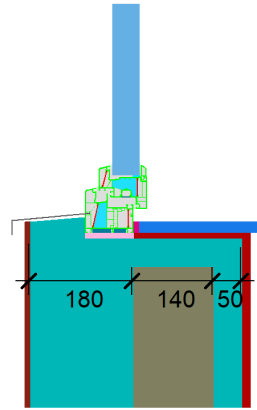
$U_1 = 0.15 \text{ [W/(m}^2 \text{ K)]}$



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

Formwork blocks bottom 2 (operable)

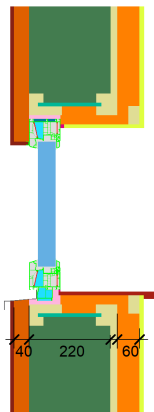
$U_1 = 0.15 \text{ [W/(m}^2 \text{ K)]}$



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

Lightweight timber bottom 2 (fixed)

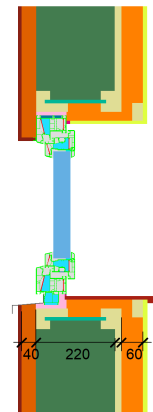
$U_1 = 0.13 \text{ [W/(m}^2 \text{ K)]}$



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

Lightweight timber bottom 2 (operable)

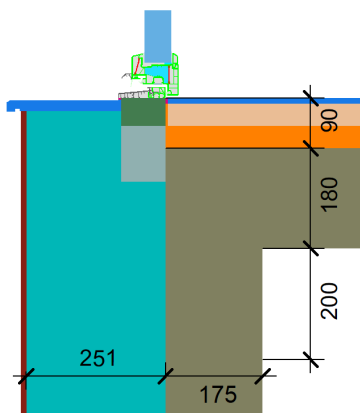
$U_1 = 0.13 \text{ [W/(m}^2 \text{ K)]}$



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

Ext insulation a. finish. s. (EIFS) threshold ceiling (operable)

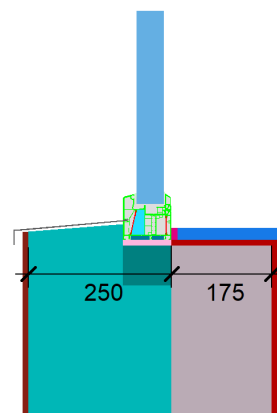
$U_1 = 0.14 \text{ [W/(m}^2 \text{ K)]}$



$\Psi_{\text{install}} = 0.08 \text{ W/(m K)}$

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

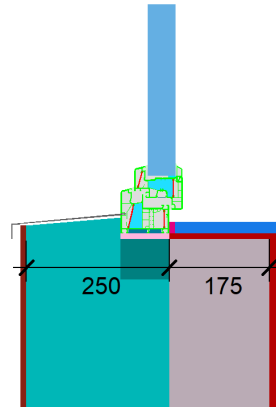
$U_1 = 0.13 \text{ [W/(m}^2 \text{ K)]}$



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

Exterior insulation and finishing s. (EIFS)
bottom (operable)

$$U_1 = 0.13 \text{ [W/(m}^2 \text{ K)]}$$



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