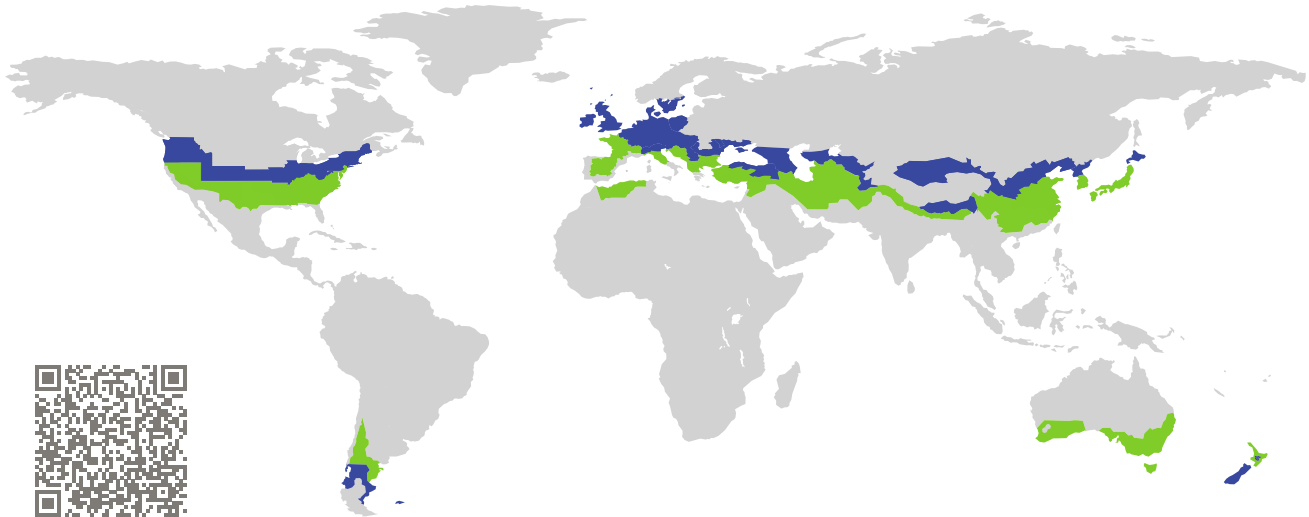


# CERTIFICATE

Certified Passive House Component

Component-ID 1835ws03 valid until 31st December 2025

Passive House Institute  
Dr. Wolfgang Feist  
64283 Darmstadt  
Germany



Category: **Window system**

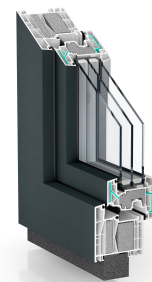
Manufacturer: **Kochs GmbH,  
Herzogenrath,  
Germany**

Product name: **Kochs eCO<sub>3</sub>**

**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  $Q_{100} = 0.16 \leq 0.25 \text{ m}^3/(\text{h m})$



cool, temperate climate



**CERTIFIED  
COMPONENT**

Passive House Institute

Passive House  
efficiency class

phE

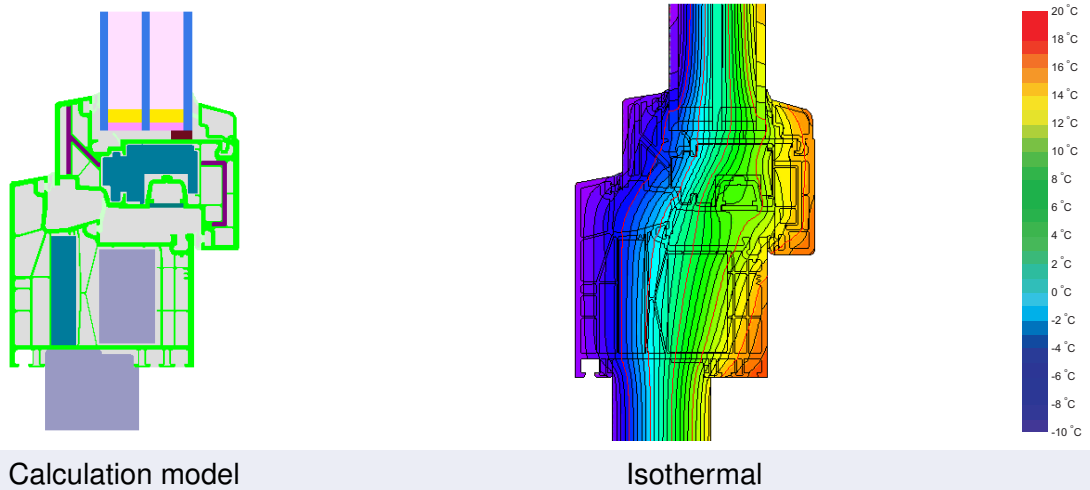
phD

phC

phB

phA

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



Calculation model Isothermal

**Description**

Vinyl window frame, insulated by EPS, 0.031 and 0.041 W/(mK). Reinforced by GRP. Allowed sesh-dimensions e.g. 1.0 \* 2.5 m or 1.5 \* 1.5 m, white or IR-reflex-coloured. Airtightness: Q100 = 0.16 m³/(hm), determined for a tilt&turn-window 1.6 \* 1.6 m. At the threshold, the dew-point criterion is achieved when installed. At the flying mullion, the temperature factor is smaller 0.7. Pane thickness: 44 mm (4/16/4/16/4), rebate depth: 17 mm. Spacer: SuperSpacer Tri-Seal.

**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	0.55	0.60	0.65	W/(m² K)
		↓	↓	↓	↓	
Window	$U_W =$	0.80	0.70	0.73	0.77	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](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)	$\Psi$ -glazing edge $\Psi_g$ W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Mullion fixed	(0M1)		98	0.94	0.027	0.72
Mullion fixed	(0M2)		124	1.01	0.028	0.73
Mullion 1 casement	(1M1)		136	0.93	0.027	0.71
Mullion 1 casement	(1M2)		162	0.99	0.028	0.72
Mullion 2 casements	(2M1)		174	0.91	0.028	0.72
Mullion 2 casements	(2M2)		200	0.97	0.028	0.70
Bottom fixed	(FB1)		122	0.71	0.027	0.73
Top fixed	(FH1)		92	0.71	0.027	0.73
Lateral fixed	(FJ1)		92	0.71	0.027	0.73
Flying Mullion	(FM1)		154	0.92	0.028	0.67
Bottom	(OB1)		160	0.77	0.028	0.73
Top	(OH1)		130	0.77	0.028	0.73
Lateral	(OJ1)		130	0.77	0.028	0.73
Threshold	(OT2)		84	1.46	0.028	0.61


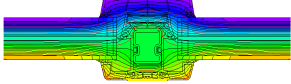
Spacer: Super Spacer® TriSeal™ / T-Spacer™ Premium


Secondary seal: Polysulfide



**Mullion fixed**


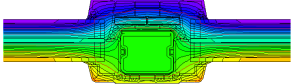
$b_f = 98 \text{ mm}$   
 $U_f = 0.94 \text{ W/(m}^2 \text{ K)}$   
 $\Psi_g = 0.027 \text{ W/(m K)}$   
 $f_{Rsi} = 0.72$



**Mullion fixed**

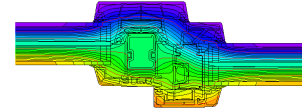
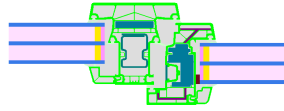
$b_f = 124 \text{ mm}$   
 $U_f = 1.01 \text{ W/(m}^2 \text{ K)}$   
 $\Psi_g = 0.028 \text{ W/(m K)}$   
 $f_{Rsi} = 0.73$



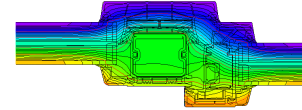
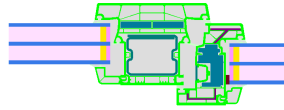
**Mullion**  
1 casement

$$b_f = 136 \text{ mm}$$
$$U_f = 0.93 \text{ W}/(\text{m}^2 \text{ K})$$
$$\Psi_g = 0.027 \text{ W}/(\text{m K})$$
$$f_{Rsi} = 0.71$$



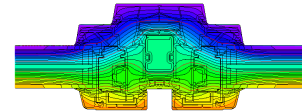
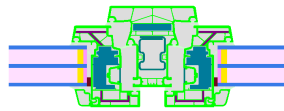
**Mullion**  
1 casement

$$b_f = 162 \text{ mm}$$
$$U_f = 0.99 \text{ W}/(\text{m}^2 \text{ K})$$
$$\Psi_g = 0.028 \text{ W}/(\text{m K})$$
$$f_{Rsi} = 0.72$$



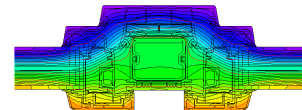
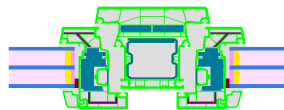
**Mullion**  
2 casements

$$b_f = 174 \text{ mm}$$
$$U_f = 0.91 \text{ W}/(\text{m}^2 \text{ K})$$
$$\Psi_g = 0.028 \text{ W}/(\text{m K})$$
$$f_{Rsi} = 0.72$$



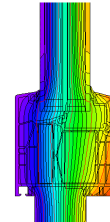
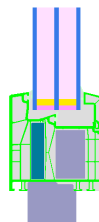
**Mullion**  
2 casements

$$b_f = 200 \text{ mm}$$
$$U_f = 0.97 \text{ W}/(\text{m}^2 \text{ K})$$
$$\Psi_g = 0.028 \text{ W}/(\text{m K})$$
$$f_{Rsi} = 0.70$$



**Bottom**  
fixed

$$b_f = 122 \text{ mm}$$
$$U_f = 0.71 \text{ W}/(\text{m}^2 \text{ K})$$
$$\Psi_g = 0.027 \text{ W}/(\text{m K})$$
$$f_{Rsi} = 0.73$$





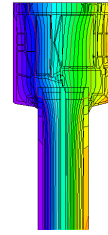
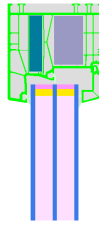
Top  
fixed

$$b_f = 92 \text{ mm}$$

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

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

$$f_{Rsi} = 0.73$$



Lateral  
fixed

$$b_f = 92 \text{ mm}$$

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

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

$$f_{Rsi} = 0.73$$



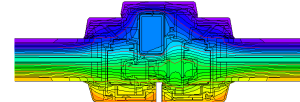
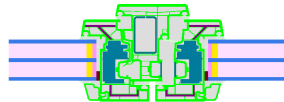
Flying Mullion

$$b_f = 154 \text{ mm}$$

$$U_f = 0.92 \text{ W/(m}^2 \text{ K)}$$

$$\Psi_g = 0.028 \text{ W/(m K)}$$

$$f_{Rsi} = 0.67$$



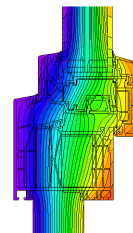
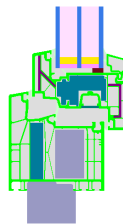
Bottom

$$b_f = 160 \text{ mm}$$

$$U_f = 0.77 \text{ W/(m}^2 \text{ K)}$$

$$\Psi_g = 0.028 \text{ W/(m K)}$$

$$f_{Rsi} = 0.73$$



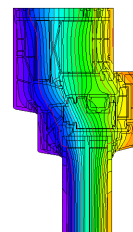
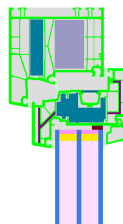
Top

$$b_f = 130 \text{ mm}$$

$$U_f = 0.77 \text{ W/(m}^2 \text{ K)}$$

$$\Psi_g = 0.028 \text{ W/(m K)}$$

$$f_{Rsi} = 0.73$$





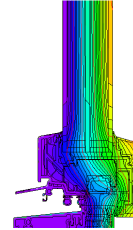
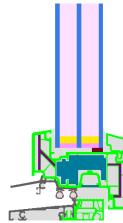
## Lateral

$$b_f = 130 \text{ mm}$$
$$U_f = 0.77 \text{ W/(m}^2 \text{ K)}$$
$$\Psi_g = 0.028 \text{ W/(m K)}$$
$$f_{Rsi} = 0.73$$

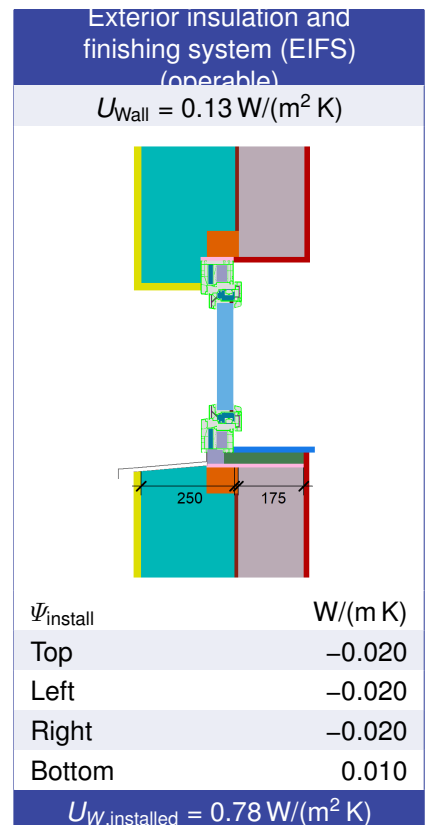
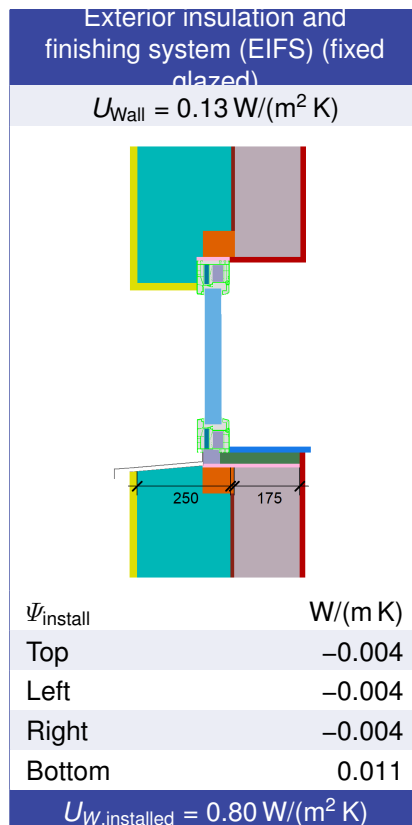
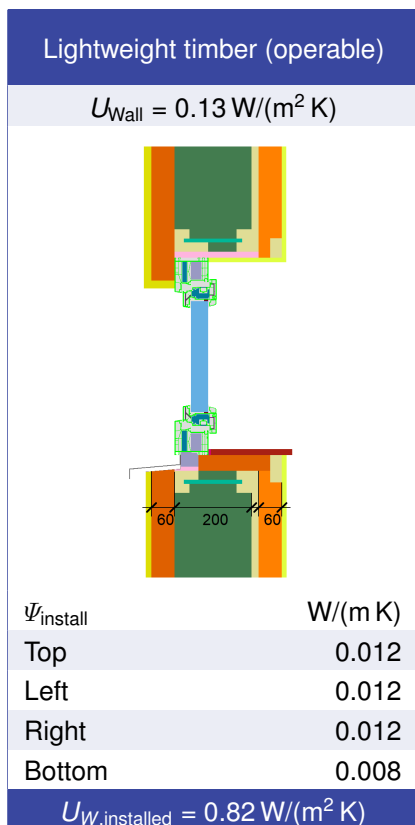
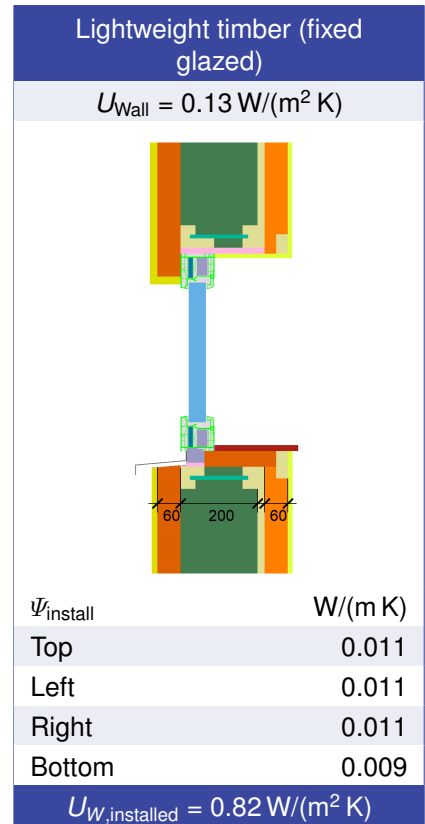
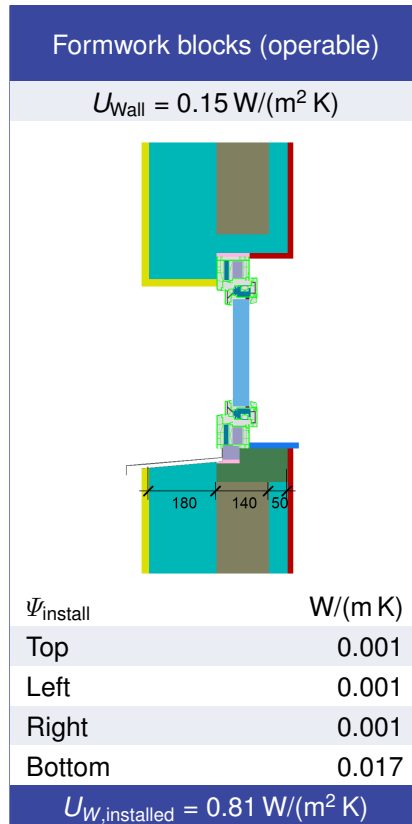
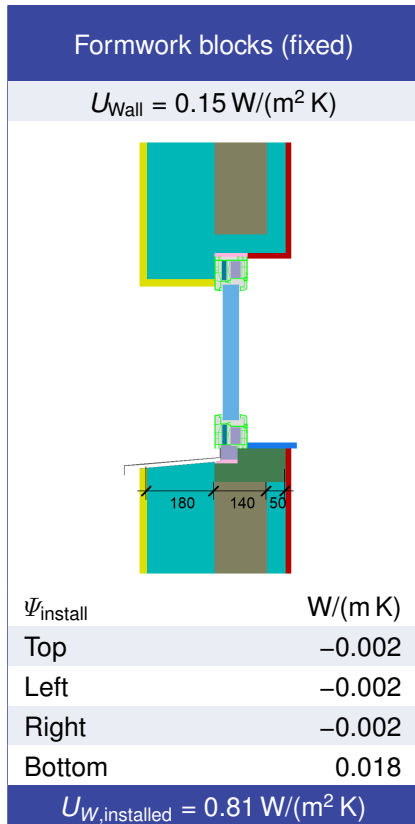


## Threshold

$$b_f = 84 \text{ mm}$$
$$U_f = 1.46 \text{ W/(m}^2 \text{ K)}$$
$$\Psi_g = 0.028 \text{ W/(m K)}$$
$$f_{Rsi} = 0.61$$

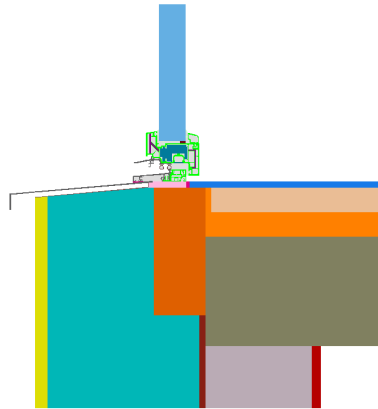


## Validated installations



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

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



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