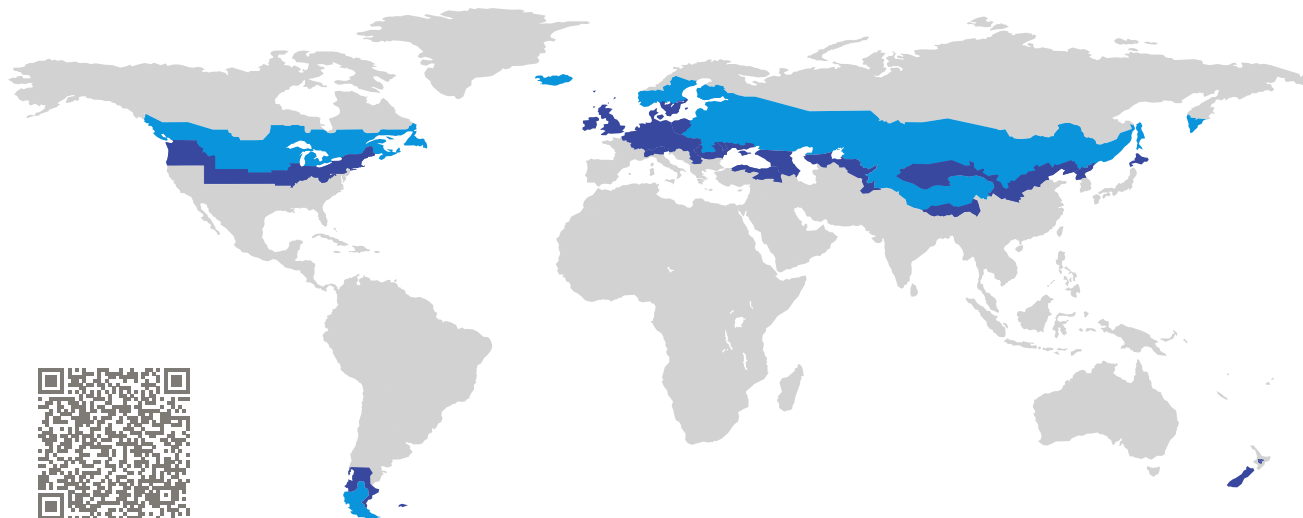


# CERTIFICATE

Certified Passive House Component

Component-ID 2062wc02 valid until 31st December 2025

Passive House Institute  
Dr. Wolfgang Feist  
64283 Darmstadt  
Germany



Category: **Window connection**

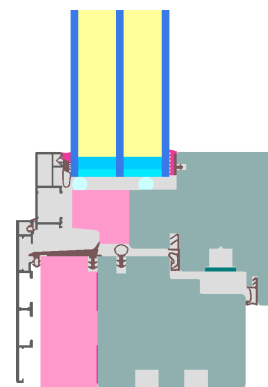
Manufacturer: **HL Studija,  
Riga,  
Latvia**

Product name: **ALTO Cold**

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

Comfort  $U_{W,installed} \leq 0.65 \text{ W}/(\text{m}^2 \text{ K})$   
with  $U_g = 0.52 \text{ W}/(\text{m}^2 \text{ K})$

Hygiene  $f_{Rsi=0.25} \geq 0.75$



Passive House  
efficiency class

phE

phD

phC

phB

phA

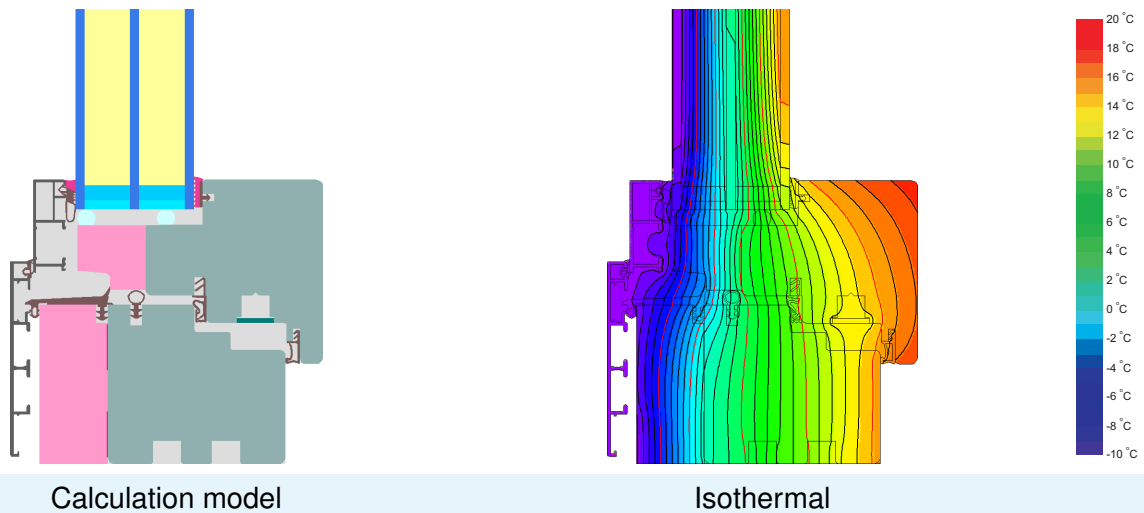
[www.passivehouse.com](http://www.passivehouse.com)

cold climate



**CERTIFIED  
COMPONENT**

Passive House Institute



### Description

Timber Aluminium frame (Spruce/fir 0,11 W/(mK)), insulated by highly resistant PS-foam (0.043 W/(mK)). Pane thickness: 52 mm (4/20/4/20/4), rebate depth: 13 mm.

### Explanation

The window U-values were calculated for the test window size of 1.23 m × 1.48 m with  $U_g = 0.52 \text{ W}/(\text{m}^2 \text{ K})$ . If a higher quality glazing is used, the window U-values will improve as follows:

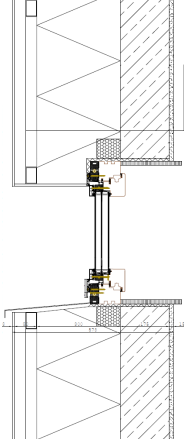
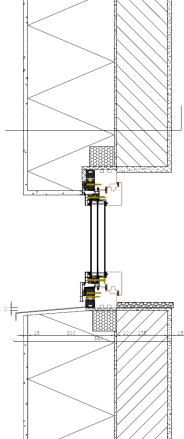
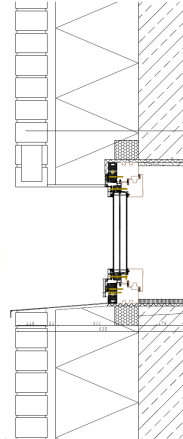
Glazing	$U_g =$	0.52	0.50	0.48	0.47	W/(m <sup>2</sup> K)
		↓	↓	↓	↓	
Window	$U_W =$	0.63	0.61	0.60	0.59	W/(m <sup>2</sup> K)





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).

## Validated installations

Ventilated facade		Exterior insulation and finishing system (EIFS) (operable)		Cavity wall (operable)	
$U_{Wall} = 0.11 \text{ W}/(\text{m}^2 \text{ K})$		$U_{Wall} = 0.11 \text{ W}/(\text{m}^2 \text{ K})$		$U_{Wall} = 0.11 \text{ W}/(\text{m}^2 \text{ K})$	
 <p>Ventilated facade – substructure Mineral wool 0.035 W/(mK) Concrete 2.3 W/(mK) Interior plaster 0.57 W/(mK)</p> <p>Suitable fastening, e.g. mounting frame or bracket, but only protruding as far as necessary for fixing the window</p>		 <p>Exterior plaster 1.0 W/(mK) EPS 0.035 W/(mK) Adhesive 0.70 W/(mK) Sand-lime brick 1.0 W/(mK) Interior plaster 0.57 W/(mK)</p> <p>Suitable fastening, e.g. mounting frame or bracket, but only protruding as far as necessary for fixing the window</p>		 <p>Clinker Brick 1.2 W/(mK) Air gap EPS 0.035 W/(mK) Sand-lime brick 1.0 W/(mK) Interior plaster 0.57 W/(mK)</p> <p>Suitable fastening, e.g. mounting frame or bracket, but only protruding as far as necessary for fixing the window</p>	
$\Psi_{install}$	W/(m K)	$\Psi_{install}$	W/(m K)	$\Psi_{install}$	W/(m K)
Top	-0.010	Top	0.003	Top	0.001
Side	-0.010	Side	0.003	Side	0.001
Bottom	0.020	Bottom	0.021	Bottom	0.020
$U_{W,installed} = 0.62 \text{ W}/(\text{m}^2 \text{ K})$		$U_{W,installed} = 0.65 \text{ W}/(\text{m}^2 \text{ K})$		$U_{W,installed} = 0.64 \text{ W}/(\text{m}^2 \text{ K})$	

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 $f_{Rsi=0.25}$ [-]
Flying Mullion (FM1)		136	0.72	0.021	0.77
Bottom (OB1)		125	0.69	0.021	0.75
Top (OH1)		125	0.69	0.021	0.75
Lateral (OJ1)		125	0.69	0.021	0.75
Spacer: MULTITECH G		Secondary seal: Butyl			

