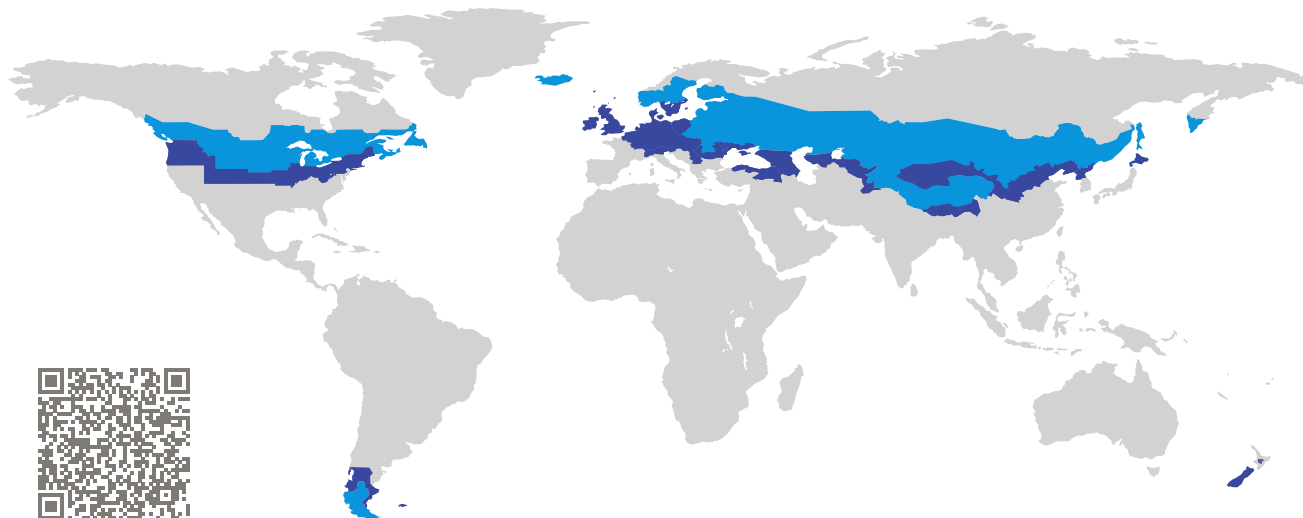


CERTIFICATE

Certified Passive House Component

Component-ID 0592rw02 valid until 31st December 2022

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany

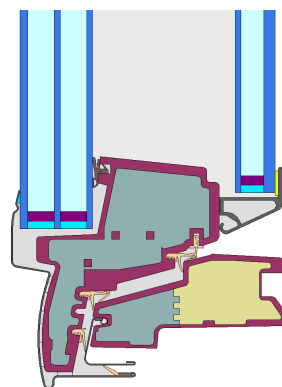


Category: **Rooflight**
Manufacturer: **VELUX A/S,
Hørsholm,
Denmark**
Product name: **GGU -K- 008230**

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

Comfort $U_{RL} = 0.57 \leq 0.80 \text{ W}/(\text{m}^2 \text{ K})$
 $U_{RL, \text{installed}} \leq 0.80 \text{ W}/(\text{m}^2 \text{ K})$
with $U_g = 0.34 \text{ W}/(\text{m}^2 \text{ K})$

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



Passive House
efficiency class

phE

phD

phC

phB

phA

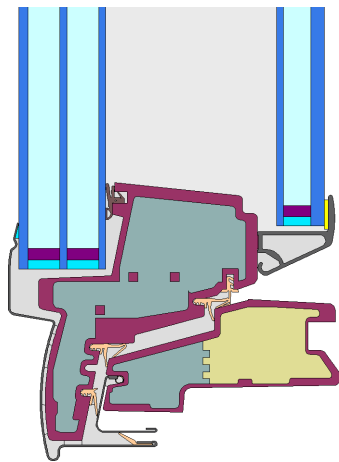
cold climate



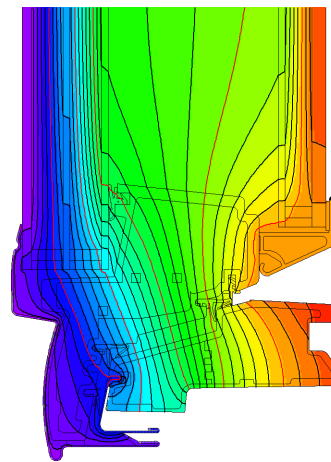
ph B

**CERTIFIED
COMPONENT**

Passive House Institute



Calculation model



Isothermal

Description

Timberframe (different types from 0.11W/(mK) to 0.14 W/(mK) (plywood)) covered with PUR and exterior facing shell of aluminium. Insulation fill (0.060 W/(mK) inside the head-section). A quintuple glazing is used. Pane thickness: 134 mm (4/14/3/14/3 - 77,6mm air gap - 3/12/6.6), Rebate depth: 15-38 mm.

Explanation




The window U-values were calculated for the test window size of 1.14 m × 1.40 m with $U_g = 0.34 \text{ W}/(\text{m}^2 \text{ K})$. If a higher quality glazing is used, the window U-values will improve as follows:

Glazing	$U_g =$	0.34	1.00	0.83	0.76	W/(m ² K)
		↓	↓	↓	↓	
Window	$U_W =$	0.57	1.05	0.92	0.87	W/(m ² K)

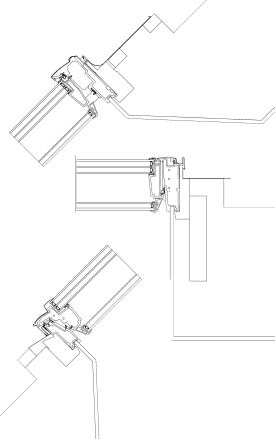
Transparent building components are classified into efficiency classes depending on the heat losses through the opaque part. The frame U-Values, frame widths, thermal bridges at the glazing edge, and the glazing edge lengths are included in these heat losses. A more detailed report of the calculations 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 $f_{RSI=0.25}$ [-]
Top	(to)		105	0.79	0.024	0.84
Side	(s)		90	0.99	0.025	0.77
Bottom	(bo)		90	1.01	0.018	0.77
			Spacer: TPS	Secondary seal: Butyl		

Validated installations

Lightweight roof	
	
Ψ_{install}	W/(m K)
Top	0.054
Side	0.046
Bottom	0.052
$U_{W,\text{installed}} = 0.72 \text{ W/(m}^2 \text{ K)}$	

