

# Certificate

## Certified Passive House Component

for cold climates; valid until 31.12.2014

Passive House Institute  
Dr. Wolfgang Feist  
64283 Darmstadt  
GERMANY

Category: **Roof Window**  
 Manufacturer: **VELUX A/S**  
**2970 Hørsholm, DENMARK**  
 Product name: **GGU -K-- 008230**

This certificate was awarded based on the following criteria:

Given a  $U_g$  value of  $0.3840 \text{ W}/(\text{m}^2\text{K})$  and a window size of  $1.14 \text{ m}$  by  $1.40 \text{ m}$ ,

$$U_{RW} = 0.55 \text{ W}/(\text{m}^2\text{K}) \leq 0.70 \text{ W}/(\text{m}^2\text{K})$$

Taking into account the installation based thermal bridges and provided that the installation is, with regard to the thermal bridges, equal or better than shown in the data sheet, the roof window meets the following criterion.

$$U_{RW, \text{installed}} \leq 0.70 \text{ W}/(\text{m}^2\text{K})$$

### Thermal data

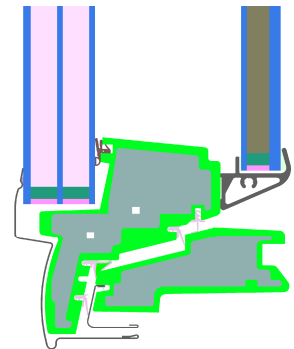
	$U_f$ -value [W/(m <sup>2</sup> K)]	Width [mm]	$\Psi_g$ [W/(mK)]	$f_{Rsi=0.25}$ [-]
Spacer	TGI*			
Bottom	0.71	123	0.019	0.77
Side oPV	0.74	106	0.025	0.78
Side uPV	0.73	106	0.025	0.78
Top	0.61	116	0.025	0.80

\*Spacers of lower thermal quality, especially those made of aluminium, lead to significantly higher thermal losses and lower temperature factors.

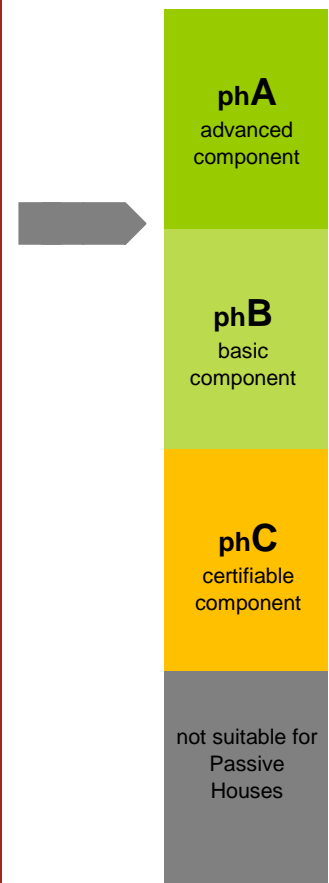
For further information, please see the data sheet

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

0592rw02



### Passive House Efficiency Class

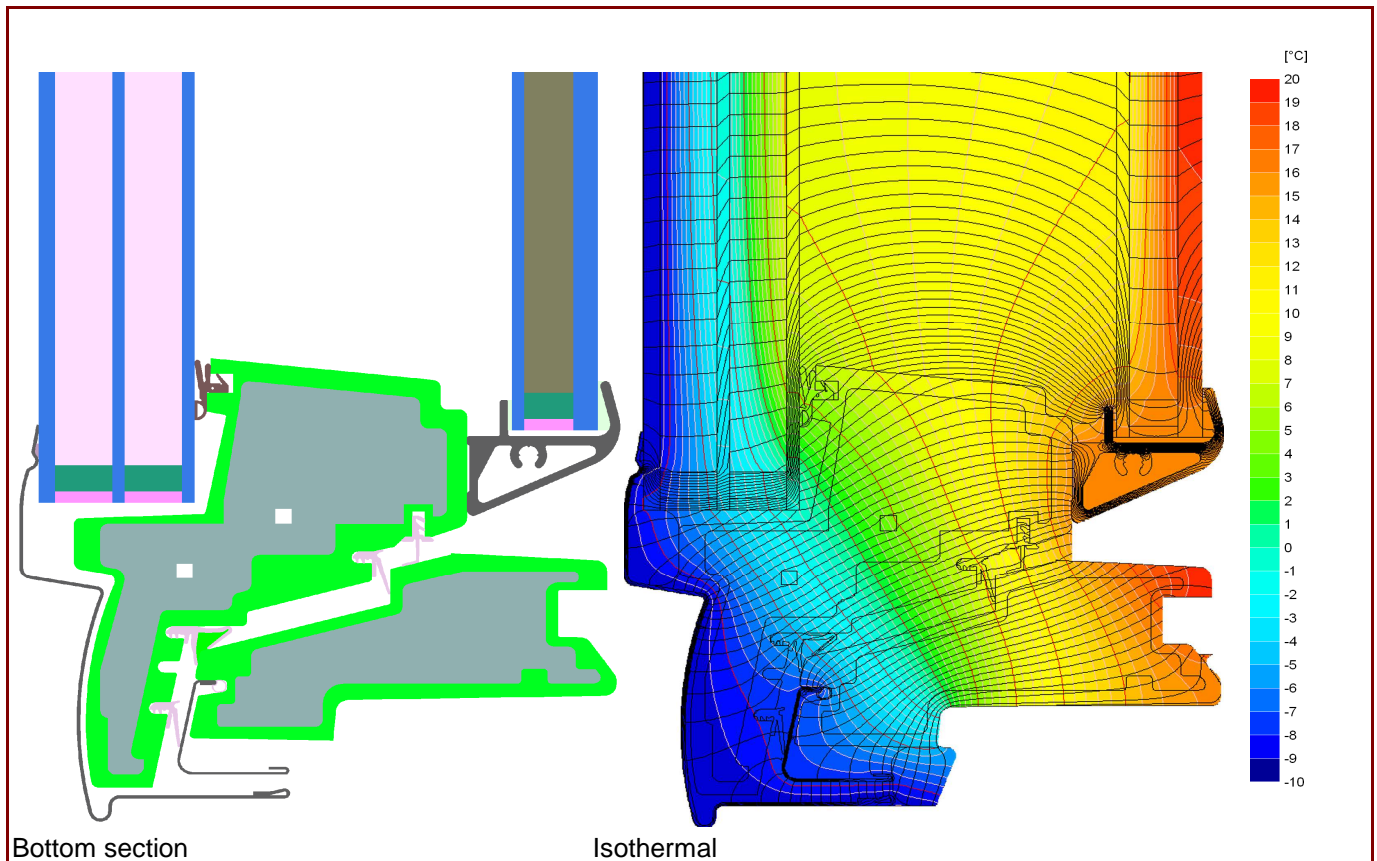


**CERTIFIED COMPONENT**

Passive House Institute

## Data Sheet VELUX A/S, GGU -K-- 008230

**Manufacturer** VELUX A/S  
 Ådalsvej 99, 2970 Hørsholm, DENMARK  
 Tel.: +45 45 16 45 16  
 www.velux.com



## Description

Timberframe (0.11W/(mK)) covered with PUR and exterior facing shell of aluminium. A quintuple glazing is used. Pane thickness: 137 mm (4/14/3/14/3 - 77,6mm air gap - 3/12/6), Rebate depth: 15-38 mm.

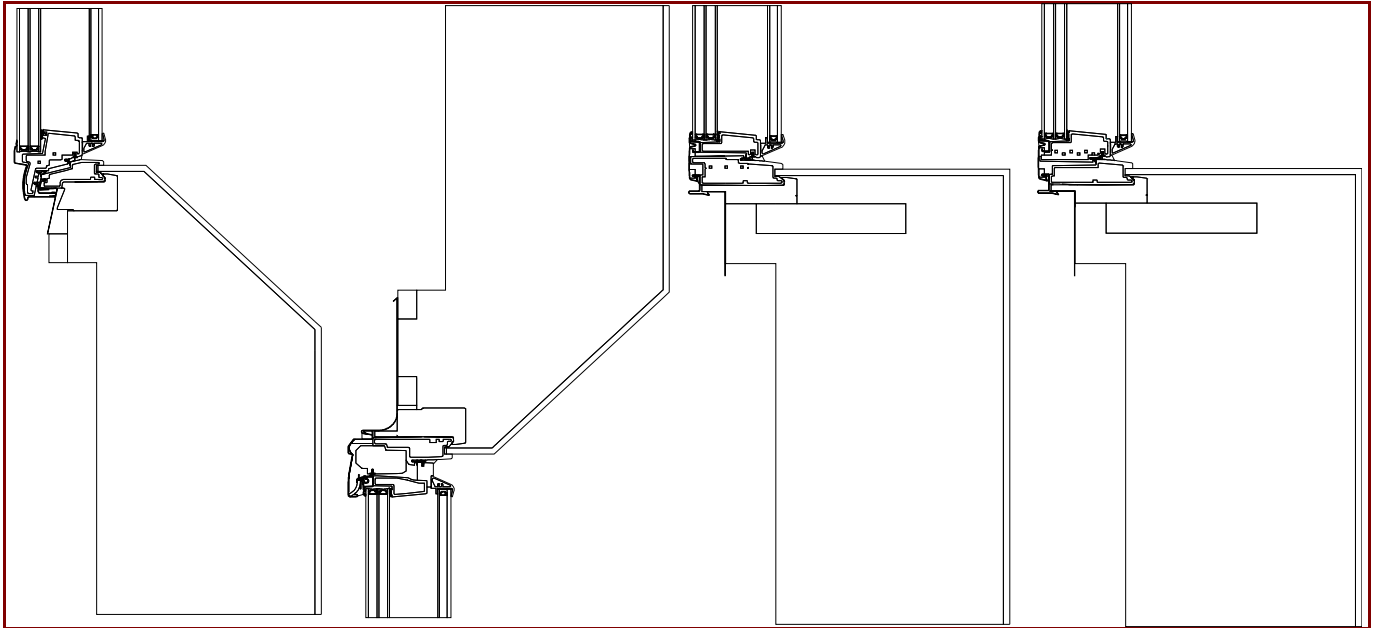
## Thermal data for the window frame

	<b>U<sub>f</sub>-value</b> [W/(m²K)]	<b>Width</b> [mm]	<b>Ψ<sub>g</sub></b> [W/(mK)]	<b>f<sub>Rsi=0.25</sub></b> [-]
Spacer			TGI*	
Bottom	0.71	123	0.019	0.77
Side oPV	0.74	106	0.025	0.78
Side uPV	0.73	106	0.025	0.78
Top	0.61	116	0.025	0.80

\* Spacers of lower thermal quality lead to higher thermal losses and lower glass edge temperatures.

# Data Sheet VELUX A/S, GGU -K-- 008230

## Installation



### Installation based thermal bridge $\Psi_{\text{instal}}$ in Passive House suitable walls

Position	Bottom	Top	oPV	uPV
Timber roof construction [W/(mK)]	0.052	0.054	0.046	0.046
$U_{W,\text{installed}}$ [W/(m <sup>2</sup> K)]	0.70	0.70	0.70	0.70

### Explanatory notes

The window U-values were calculated based on a 1.23 m by 1.48 m window  $U_g = 0.384 \text{ W/(m}^2\text{K)}$ .  
If another glazing is used, the window U-values change as follows:

<b>U Glazing</b>	$U_g$ [W/(m <sup>2</sup> K)]	0.70	0.60	0.50
<b>U Window</b>	$U_w$ [W/(m <sup>2</sup> K)]	0.76	0.69	0.63

Depending on the thermal losses through opaque elements, transparent components are categorised according to efficiency classes. These thermal losses include the losses through the frame, the frame width, the thermal bridge at the glass edge as well as the length of the glass edge. Certificates for arctic regions are too valid vor cold, certificates for cold regions are too valid for cool, temperate zones.

Please ask the manufacturer for a detailed report containing all calculations and results.  
For further information, please visit [www.passivehouse.com](http://www.passivehouse.com) or [www.passipedia.org](http://www.passipedia.org).