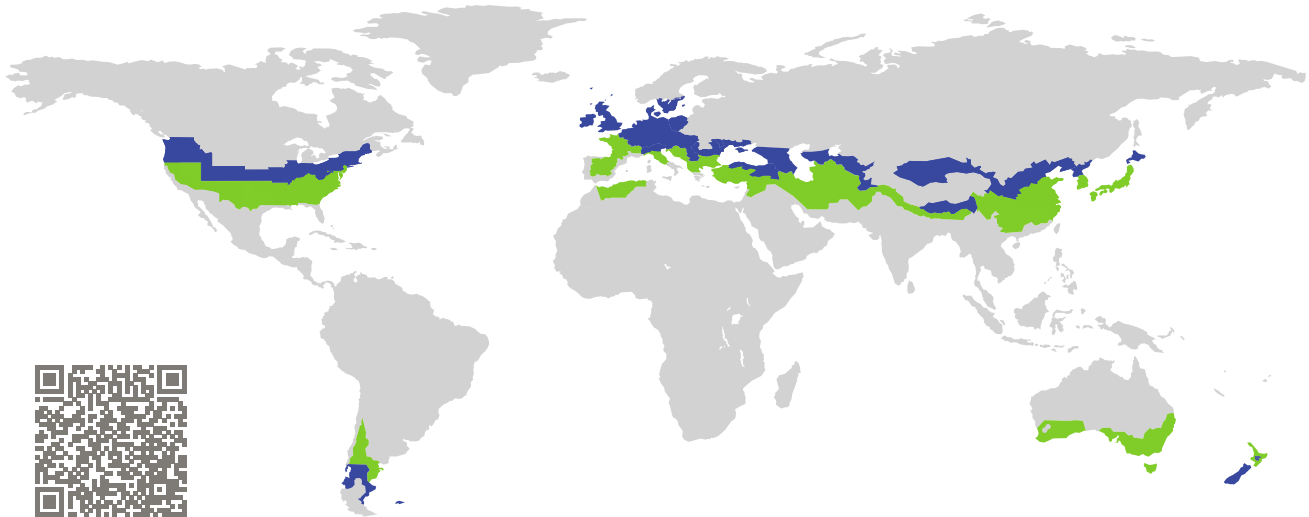


CERTIFICATE

Certified Passive House Component

Component-ID 0879wi03 valid until 31st December 2018

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany

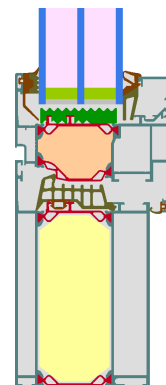


Category: **Window Frame**
Manufacturer: **heroal - Johann Henkenjohann GmbH & Co.KG, Verl, Germany**
Product name: **heroal W 77 PH**

This certificate was awarded based on the following criteria for the cool, temperate climate zone

Comfort $U_W = 0.79 \leq 0.80 \text{ W}/(\text{m}^2 \text{ K})$
 $U_{W,\text{installed}} \leq 0.85 \text{ W}/(\text{m}^2 \text{ K})$
with $U_g = 0.70 \text{ W}/(\text{m}^2 \text{ K})$

Hygiene $f_{Rsi=0.25} \geq 0.70$



cool, temperate climate



CERTIFIED COMPONENT

Passive House Institute

Passive House
efficiency class

phE

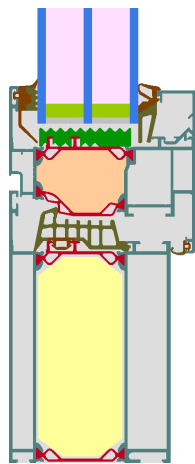
phD

phC

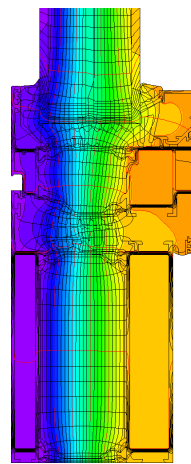
phB

phA

www.passivehouse.com



Calculation model



Isothermal

Description

Aluminum window frame with Resol- and PU-foam insulation. Pane thickness: 48 mm (4/18/4/18/4), rebate depth: 18 mm, spacer: SWISSPACER Ultimate

Explanation





The window U-values were calculated for the test window size of 1.23 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	$\text{W}/(\text{m}^2 \text{ K})$
		↓	↓	↓	↓	
Window	$U_W =$	0.79	0.76	0.73	0.70	$\text{W}/(\text{m}^2 \text{ K})$

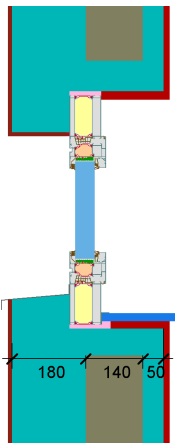
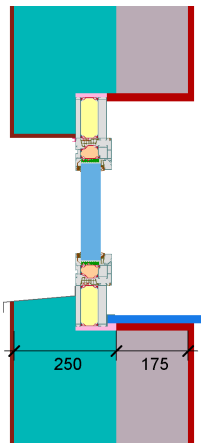
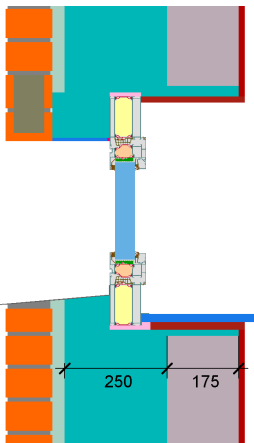
Transparent building components are classified into efficiency classes depending on the heat losses through the opaque part. The frame U-Values, frame widths, thermal bridges at the glazing edge, and the glazing edge lengths are included in these heat losses. A more detailed report of the calculations 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 -panel edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Top	(to)		180	0.78	0.025	0.78
Side	(s)		180	0.78	0.025	0.78
Bottom	(bo)		180	0.78	0.025	0.78
Mullion flying	(fm)		214	0.80	0.026	0.77
			Spacer: SWISSPACER Ultimate		Secondary seal: Polysulfide	

Validated installations

Insulated formwork blocks		EIFS		Cavity wall (operable)	
$U_{Wall} = 0.13 \text{ W/(m}^2 \text{ K)}$		$U_{Wall} = 0.13 \text{ W/(m}^2 \text{ K)}$		$U_{Wall} = 0.15 \text{ W/(m}^2 \text{ K)}$	
					
$\Psi_{install}$	W/(m K)	$\Psi_{install}$	W/(m K)	$\Psi_{install}$	W/(m K)
Top	0.013	Top	0.013	Top	0.008
Side	0.013	Side	0.013	Side	0.008
Bottom	0.021	Bottom	0.019	Bottom	0.008
$U_{W,installed} = 0.84 \text{ W/(m}^2 \text{ K)}$		$U_{W,installed} = 0.83 \text{ W/(m}^2 \text{ K)}$		$U_{W,installed} = 0.82 \text{ W/(m}^2 \text{ K)}$	

