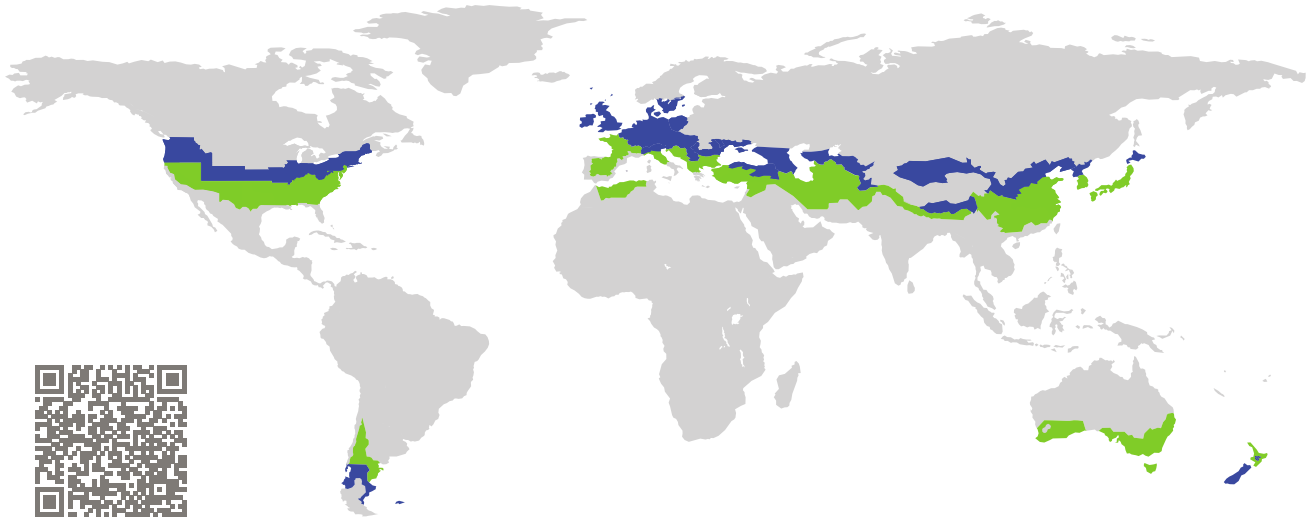


CERTIFICATE

Certified Passive House Component

Component-ID 1015fx03 valid until 31st December 2018

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany

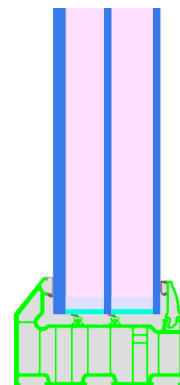


Category: **Fixed window**
Manufacturer: **HL Plastics Ltd. trading as Liniar,
Derby,
United Kingdom**
Product name: **Energy Plus 90 (fixed)**

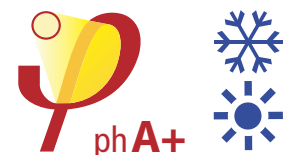
**This certificate was awarded based on the following
criteria for the cool, temperate climate zone**

Comfort $U_W = 0.75 \leq 0.80 \text{ W}/(\text{m}^2 \text{ K})$
 $U_{W,\text{installed}} \leq 0.85 \text{ W}/(\text{m}^2 \text{ K})$
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

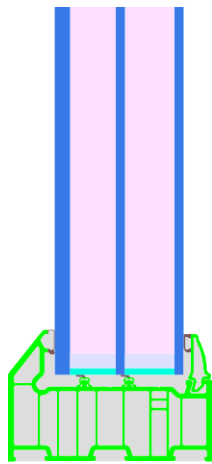
phC

phB

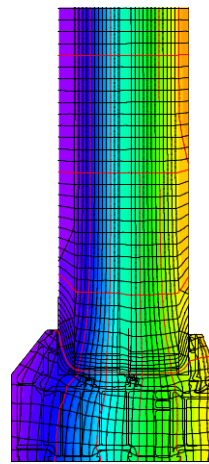
phA

phA+

www.passivehouse.com



Calculation model



Isothermal

Description

Fixed PVC frame with multiple air chambers. Glazing: 6,8 / 20 / 4 / 22 / 4 mm. Glass intersection: 18 mm. Spacer: SWISSPACER Ultimate, Butyl secondary seal.

Explanation






The window U-values were calculated for the test window size of 1.23 m × 1.48 m with $U_g = 0.70$ W/(m² 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	W/(m ² K)
		↓	↓	↓	↓	
Window	$U_W =$	0.75	0.70	0.65	0.60	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.

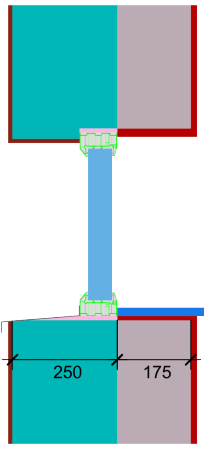
Further information relating to certification can be found on www.passivehouse.com and passipedia.org.

Frame values			Frame width b_f mm	U -value frame U_f W/(m ² K)	Ψ -panel edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Top fixed	(tof)		58	0.69	0.020	0.77
Side fixed	(sf)		58	0.69	0.020	0.77
Bottom fixed	(bof)		58	0.69	0.020	0.77
Mullion fixed	(m)		71	0.64	0.020	0.77
Transom fixed	(tf)		71	0.64	0.020	0.77
Spacer: SWISSPACER Ultimate			Secondary seal: Butyl			

Validated installations

Exterior insulation and finishing system (EIFS) (fixed glazed)

$U_{Wall} = 0.13 \text{ W/(m}^2 \text{ K)}$

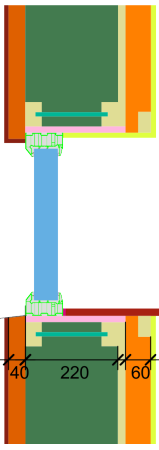


$\Psi_{install}$	W/(m K)
Top	0.011
Side	0.011
Bottom	0.017

$U_{W,installed} = 0.79 \text{ W/(m}^2 \text{ K)}$

Lightweight timber (fixed glazed)

$U_{Wall} = 0.13 \text{ W/(m}^2 \text{ K)}$

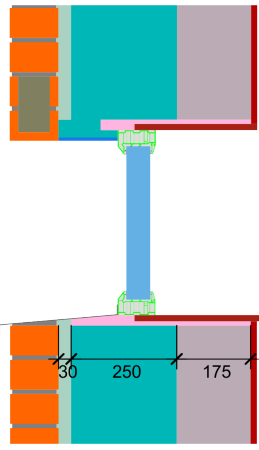


$\Psi_{install}$	W/(m K)
Top	0.020
Side	0.020
Bottom	0.022

$U_{W,installed} = 0.81 \text{ W/(m}^2 \text{ K)}$

Cavity wall (fixed glazing)

$U_{Wall} = 0.13 \text{ W/(m}^2 \text{ K)}$



$\Psi_{install}$	W/(m K)
Top	0.013
Side	0.013
Bottom	0.018

$U_{W,installed} = 0.79 \text{ W/(m}^2 \text{ K)}$

