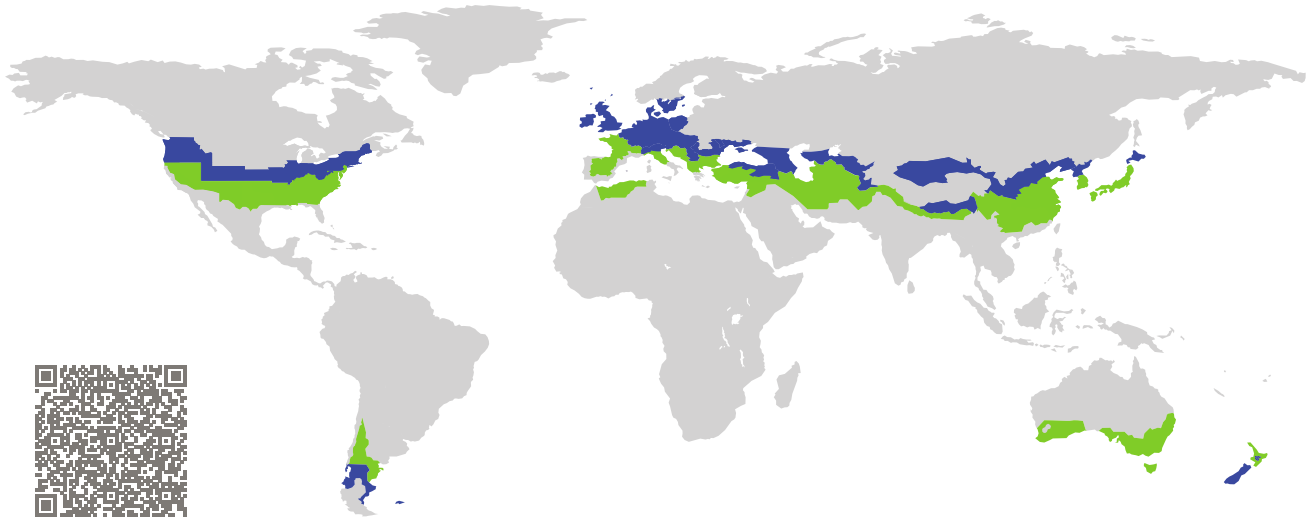


CERTIFICATE

Certified Passive House Component

Component-ID 1839wi03 valid until 31st December 2026

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany

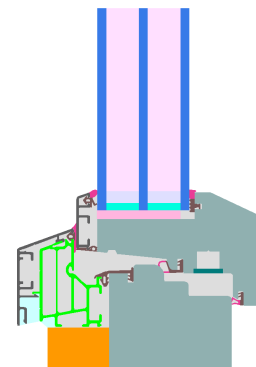


Category: **Window Frame**
Manufacturer: **Qing Dao Hong Hai Green Energy Co. LTD,**
Qingdao,
China
Product name: **HHLM120**

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

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

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



Passive House
efficiency class

phE

phD

phC

phB

phA

www.passivehouse.com

cool, temperate climate

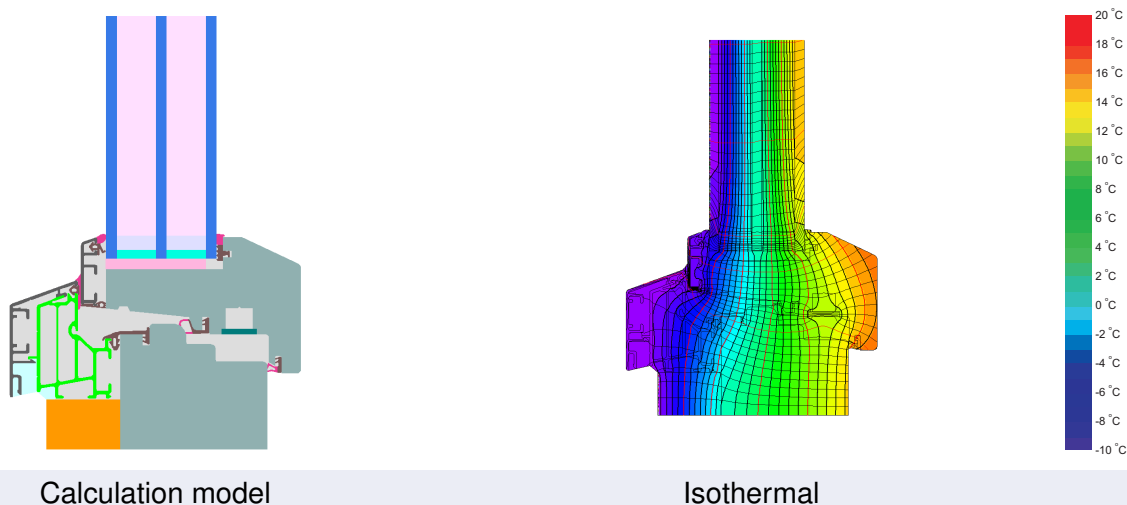


ph B



**CERTIFIED
COMPONENT**

Passive House Institute



Description

Timber frame (Spruce/fir 0.11 W/(mK)) with insulation (0.036 W/(mK)) and external shell (made of PVC and aluminium); Pane thickness: 51 mm (5/18/5/18/5), rebate depth: 15 mm. Spacer: SWISSPACER Ultimate with butyl as 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	0.54	W/(m ² K)
		↓	↓	↓	↓	
Window	$U_W =$	0.80	0.76	0.71	0.68	W/(m ² K)

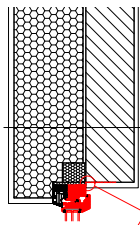
Transparent building components are classified into efficiency classes depending on the heat losses through the opaque part. The frame U-Values, frame widths, thermal bridges at the glazing edge, and the glazing edge lengths are included in these heat losses. A more detailed report of the calculations performed in the context of certification is available from the manufacturer.

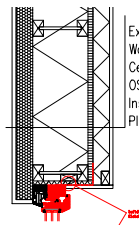
The Passive House Institute has defined international component criteria for seven climate zones. In principle, components which have been certified for climate zones with higher requirements may also be used in climates with less stringent requirements. In a particular climate zone it may make sense to use a component of a higher thermal quality which has been certified for a climate zone with more stringent requirements.

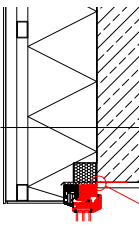
Further information relating to certification can be found on www.passivehouse.com and passipedia.org.

Frame values			Frame width b_f mm	U -value frame U_f W/(m² K)	Ψ -glazing edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Transom 1 casement	(1T1)		138	0.83	0.023	0.73
Bottom	(OB1)		98	0.87	0.023	0.73
Head	(OH1)		98	0.85	0.023	0.73
Jamb	(OJ1)		98	0.85	0.023	0.73
Spacer: Swisspacer Ultimate			Secondary seal: Butyl			

Validated installations

Exterior insulation and finishing system	
$U_{Wall} = 0.13 \text{ W/(m}^2 \text{ K)}$	
 <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>	
$\Psi_{install}$	W/(m K)
Top	0.010
Side	0.010
Bottom	0.019
$U_{W,installed} = 0.84 \text{ W/(m}^2 \text{ K)}$	

Lightweight timber (operable)	
$U_{Wall} = 0.13 \text{ W/(m}^2 \text{ K)}$	
 <p>Exterior plaster 1.0 W/(mK) Wood fibre board 0.050 W/(mK) Cellulose 0.040 W/(mK) OSB-board 0.13 W/(mK) Insulation 0.040 W/(mK) Plasterboard 0.25 W/(mK)</p> <p>point connection made from timber battens</p>	
$\Psi_{install}$	W/(m K)
Top	0.015
Side	0.015
Bottom	0.024
$U_{W,installed} = 0.85 \text{ W/(m}^2 \text{ K)}$	

Ventilated facade	
$U_{Wall} = 0.13 \text{ W/(m}^2 \text{ K)}$	
 <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>	
$\Psi_{install}$	W/(m K)
Top	0.012
Side	0.012
Bottom	0.019
$U_{W,installed} = 0.84 \text{ W/(m}^2 \text{ K)}$	

Disclaimer: The Passive House Institute GmbH (PHI) conducts heat-transfer analyses in accordance with the standards set out in Criteria and Algorithms for Certified Passive House Components: Transparent Building Components and Opening Elements in the Building Envelope, based on information provided by the manufacturer. PHI does not verify on-site implementation. It is the responsibility of the project leader to ensure that installed components match the certified specifications in terms of geometry, configuration, and materials. Manufacturers must make full product information available upon request to parties involved in a construction project. These parties may compare the provided information with project documentation and perform on-site inspections as part of the quality-assurance process.

