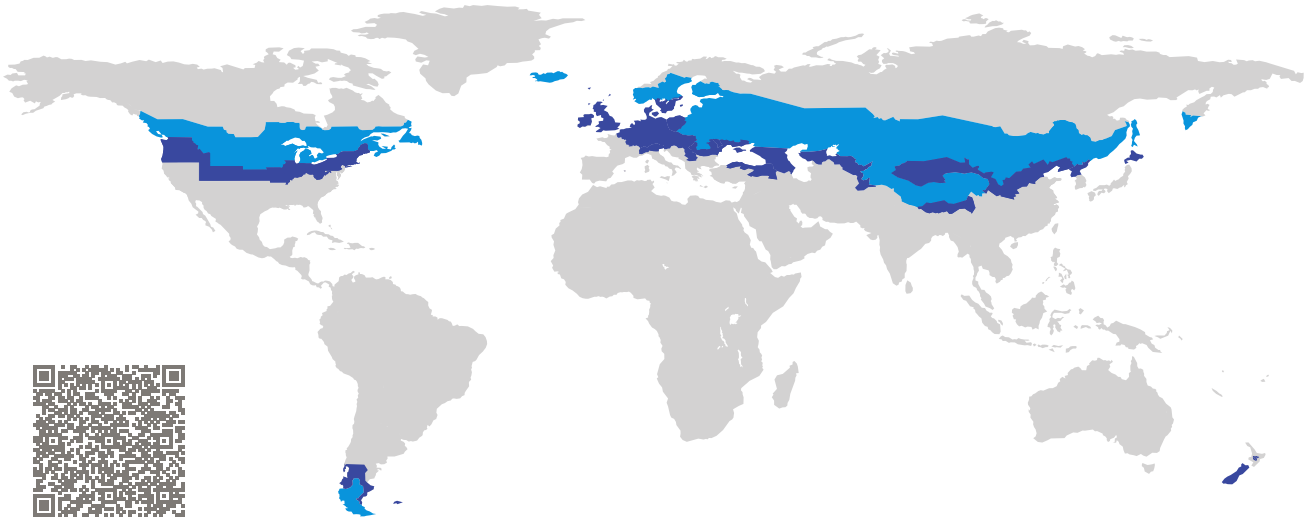
CERTIFICATE

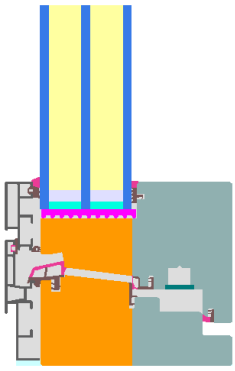
Certified Passive House Component

Component-ID 1459ws02 valid until 31st December 2019

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany



Category:	**Window system**
Manufacturer:	**Hebei Orient Sundar Window Co., Ltd., Gaobeidian City, Hebei Province, China**
Product name:	**All Climate Passive 126 C+ cold**



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

Comfort	$U_W = 0.60$	$\leq$	0.60 W/(m² K)
	$U_{W,\text{installed}}$	$\leq$	0.65 W/(m² K)
	with U_g	=	0.52 W/(m² K)
Hygiene	$f_{Rsi=0.25}$	$\geq$	0.75
Airtightness	$Q_{100} = 0.23$	$\leq$	0.25 m³/(h m)

cold climate

phA

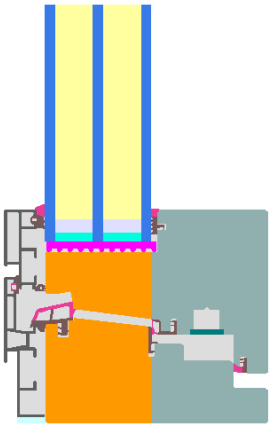
CERTIFIED COMPONENT

Passive House Institute

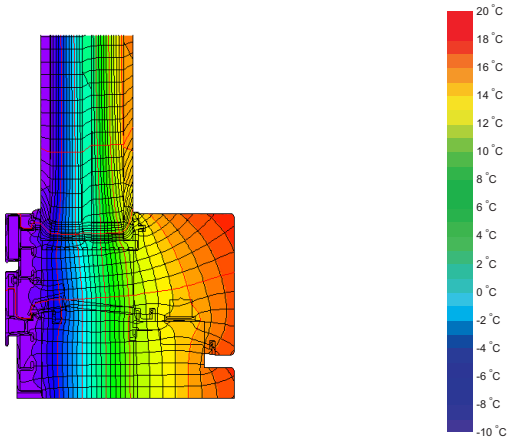
Passive House efficiency class	phE	phD	phC	phB	phA

www.passivehouse.com

Hebei Orient Sundar Window Co., Ltd.
Internation Window-Door Science-Technology Buiding, Dongfang Road No.7, 074000 Gaobeidian City, Hebei Province, China
☎ + 863126392755 | ✉ alrunsd1999@yeah.net | http://www.alrunsd.com |



Calculation model



Isothermal

Description

Timber Aluminium window frame insulated by high rigid EPS, 168 kg/m^3, 0.043 W/(mK). Airtightness: Q100 = 0.23 m^3/(mh), measured at a combination of wndow with fixed glazing and tilt&turn sash. 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 2.46 m × 1.48 m with U_g = 0.52 W/(m^2 K). If a higher quality glazing is used, the window U-values will improve as follows:

Glazing	U_g =	0.52	0.35	0.58	0.64	W/(m^2 K)
		↓	↓	↓	↓	
Window	U_W =	0.60	0.47	0.64	0.69	W/(m^2 K)

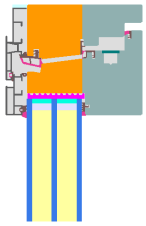
Transparent building components are classified into efficiency classes depending on the heat losses through the opaque part. The frame U-Values, frame widths, thermal bridges at the glazing edge, and the glazing edge lengths are included in these heat losses. A more detailed report of the calculations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

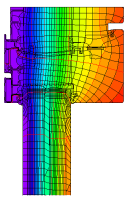
Further information relating to certification
can be found on www.passivehouse.com and passipedia.org.

Frame values			Frame width b_f mm	U-value frame U_f W/(m² K)	Ψ-panel edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Top	(to)		102	0.58	0.025	0.76
Side	(s)		102	0.58	0.025	0.76
Bottom	(bo)		102	0.58	0.025	0.76
Top fixed	(tof)		74	0.58	0.023	0.76
Side fixed	(sf)		74	0.58	0.023	0.76
Bottom fixed	(bof)		74	0.58	0.023	0.76
Mullion flying	(fm)		116	0.59	0.025	0.76
Mullion fixed	(m)		115	0.58	0.023	0.76
Mullion 1 casement	(m1)		143	0.59	0.024	0.75
Mullion 2 casements	(m2)		171	0.60	0.025	0.76
Transom fixed	(tf)		115	0.58	0.023	0.76
Transom 1 casement	(t1)		143	0.59	0.024	0.75
Transom 2 casements	(t2)		171	0.60	0.025	0.76
			Spacer:	Secondary seal:		

Top

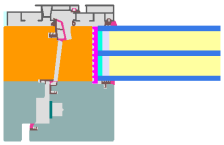
b_f = 102.00 mm
U_f = 0.58 W/(m² K)
Ψ_g = 0.025 W/(m K)
f_{Rsi} = 0.76

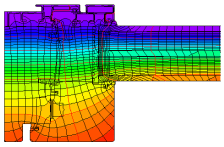




Side

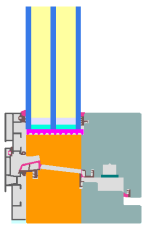
b_f = 102.00 mm
U_f = 0.58 W/(m² K)
Ψ_g = 0.025 W/(m K)
f_{Rsi} = 0.76

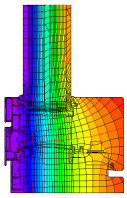




Bottom

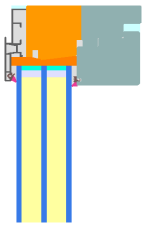
b_f = 102.00 mm
U_f = 0.58 W/(m² K)
Ψ_g = 0.025 W/(m K)
f_{Rsi} = 0.76

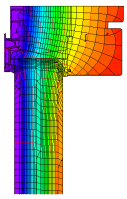




Top
fixed

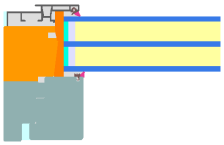
b_f = 74.00 mm
U_f = 0.58 W/(m² K)
Ψ_g = 0.023 W/(m K)
f_{Rsi} = 0.76

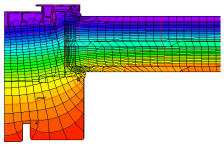




Side
fixed

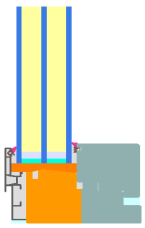
b_f = 74.00 mm
U_f = 0.58 W/(m² K)
Ψ_g = 0.023 W/(m K)
f_{Rsi} = 0.76

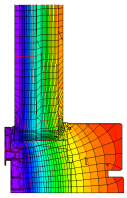




Bottom
fixed

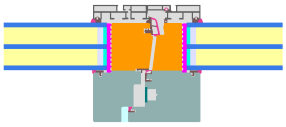
b_f = 74.00 mm
U_f = 0.58 W/(m² K)
Ψ_g = 0.023 W/(m K)
f_{Rsi} = 0.76

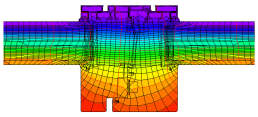




Mullion
flying

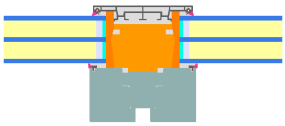
b_f = 116.00 mm
U_f = 0.59 W/(m² K)
Ψ_g = 0.025 W/(m K)
f_{Rsi} = 0.76

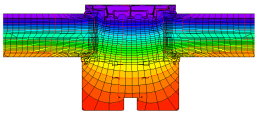




Mullion
fixed

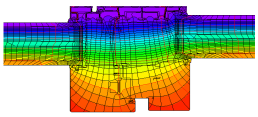
b_f = 115.00 mm
U_f = 0.58 W/(m² K)
Ψ_g = 0.023 W/(m K)
f_{Rsi} = 0.76





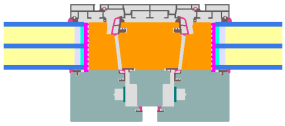
Mullion
1 casement

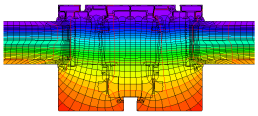
b_f = 143.00 mm
U_f = 0.59 W/(m² K)
Ψ_g = 0.024 W/(m K)
f_{Rsi} = 0.75



Mullion
2 casements

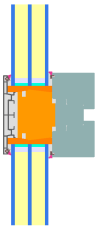
b_f = 171.00 mm
U_f = 0.60 W/(m² K)
Ψ_g = 0.025 W/(m K)
f_{Rsi} = 0.76

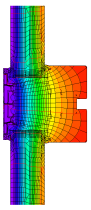




Transom
fixed

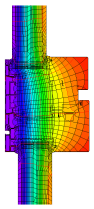
b_f = 115.00 mm
U_f = 0.58 W/(m² K)
Ψ_g = 0.023 W/(m K)
f_{Rsi} = 0.76





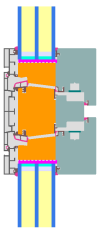
Transom
1 casement

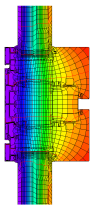
b_f = 143.00 mm
U_f = 0.59 W/(m² K)
Ψ_g = 0.024 W/(m K)
f_{Rsi} = 0.75



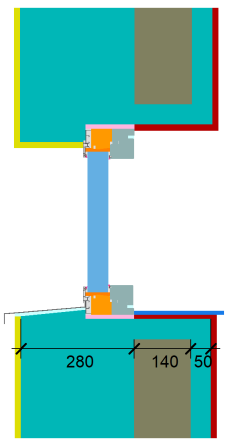
Transom
2 casements

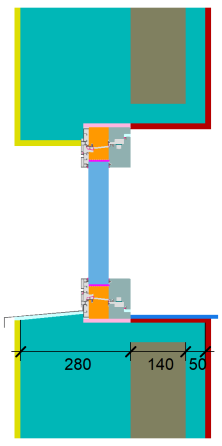
b_f = 171.00 mm
U_f = 0.60 W/(m² K)
Ψ_g = 0.025 W/(m K)
f_{Rsi} = 0.75

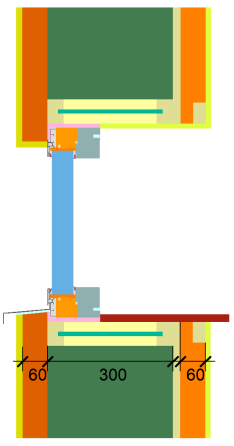


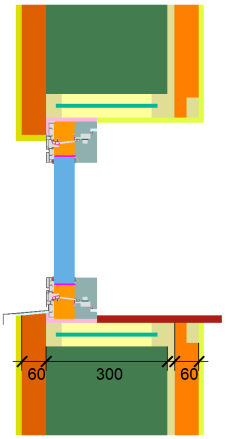
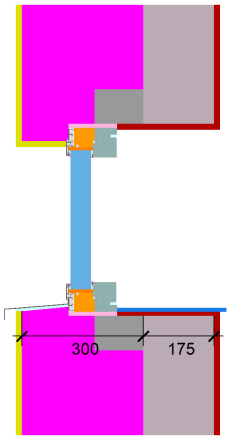
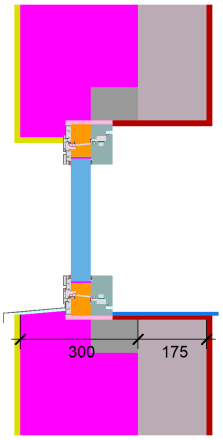


Validated installations

Formwork blocks (fixed)	
U_{Wall} = 0.10 W/(m² K)	
	
$\Psi_{install}$	W/(m K)
Top	0.011
Left	0.011
Right	0.011
Bottom	0.013
$U_{W,installed}$ = 0.63 W/(m² K)	

Formwork blocks (operable)	
U_{Wall} = 0.10 W/(m² K)	
	
$\Psi_{install}$	W/(m K)
Top	0.011
Left	0.011
Right	0.011
Bottom	0.013
$U_{W,installed}$ = 0.63 W/(m² K)	

Lighthweight timber (fixed glazed)	
U_{Wall} = 0.10 W/(m² K)	
	
$\Psi_{install}$	W/(m K)
Top	0.020
Left	0.017
Right	0.017
Bottom	0.022
$U_{W,installed}$ = 0.64 W/(m² K)	

Lightweight timber (operable)	Exterior insulation and finishing system (EIFS) (fixed glazed)	Exterior insulation and finishing system (EIFS) (operable)
U_{Wall} = 0.10 W/(m² K)	U_{Wall} = 0.11 W/(m² K)	U_{Wall} = 0.11 W/(m² K)
		
$\Psi_{install}$ W/(m K)	$\Psi_{install}$ W/(m K)	$\Psi_{install}$ W/(m K)
Top 0.019	Top 0.100	Top 0.100
Left 0.017	Left 0.100	Left 0.100
Right 0.017	Right 0.100	Right 0.100
Bottom 0.021	Bottom 0.120	Bottom 0.110
$U_{W,installed}$ = 0.64 W/(m² K)	$U_{W,installed}$ = 0.83 W/(m² K)	$U_{W,installed}$ = 0.82 W/(m² K)