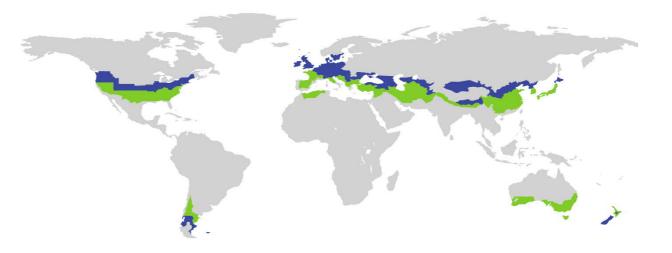
CERTIFICATE

Certified Passive House Component ID: 1380cs03 valid until 31. December 2025

Aditional thermal bridges

Name TCEA02 Thermal bridge

Description f_{Rsi} Ψ = -0,05 W/(mK) 0,90 Cold roof to external wall



Construction system | Steel construction Category Manufacturer Shandong Province, CHINA **Light Steel Construction System** Product name

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

Hygiene criterion

The minimum temperature factor of the interior surface

Comfort criterion

The U-value of the installed windows is

Efficiency criteria

Heat transfer coefficient of building envelope Temperature factor of opaque junctions Thermal bridge-free design for key connection details

An airtightness concept for all components and conn details was provided

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cool, temperate climate



Passive House Institute Dr. Wolfgang Feist 64342 Darmstadt GERMANY

Weifang Tailai Steel Structure Engineering Co., Ltd.

aces is	$f_{Rsi=0,25m^2K/W}$ ≥	0,70
	U _{W,i} ≤	0,85 W/(m²K)
	U*f _{PHI} ≤ f _{Rsi=0,25m²K/W} ≥	0,15 W/(m²K) 0,86
ls	Ψ≤	0,01 W/(mK)
nection	cool, tempe	erate climate



Weifang Tailai Steel Structure Engineering Co., Ltd. No. 3430 Huangshan Rd., Dongcheng District, Linqu County, 262600 Shandong Province, CHINA Phone: | +86-536-3396838 | wftlgjg@163.com | www.wftailai.com

Opaque building envelope

With the Light Steel Construction System the wintertime thermal insulation of buildings can be ensured. The system is constructed out of lightweight steel profiles, connected using timber/OSB connectors. The assembly is insulated to the outside and within the service cavity using mineral wool (</=0,04 W/mK) and with EPS (</=0,035 W/mK) to the interior. For the purpose of certification, a number of three-dimensional simualtions were carried out to determine the effective thermal conductivity of insualtion plus steel profiles where these create regularly occurring or point thermal bridges. The certification does not take into account point thermal bridges caused by structural columns or e.g. balcony connections, which will need to be assessed separately. As investigated, the system is deemed suitable for passive houses in the cool-temperate climate zone, as both the regular U-values of the exterior components are below 0,15 W/m²K and the connections meet the criteria of 'thermal bridge free'. The surface temperature of all connections (with the exception of window connections) meet the surface temperature requirements.

Windows

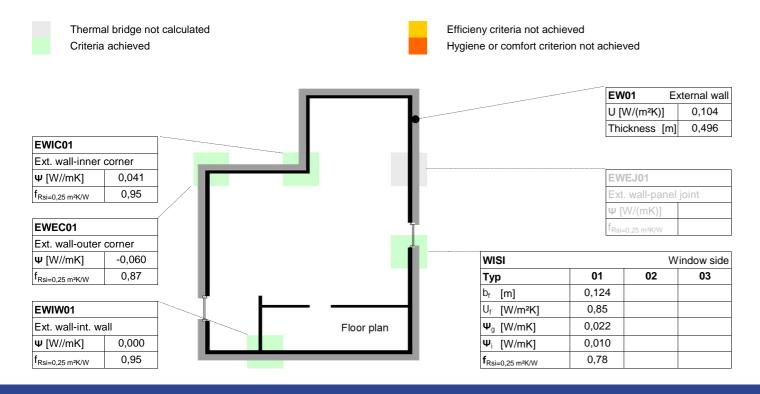
For the purposes of certificaiton a standard passive house window (Veka Pkastics Shanghai Ltd. Softline 82 MD PSR, Uw = $0,80 \text{ W/m}^2\text{K}$ with Ug = $0,70 \text{ W/m}^2\text{K}$) was used. The overall U-value of the installed window of standard size (1,23 m wide by 1,48 m tall) should be no more than $0,05 \text{ W/m}^2\text{K}$ greater than the Uw to ensure occupant comfort - this criteria is met in this instance.

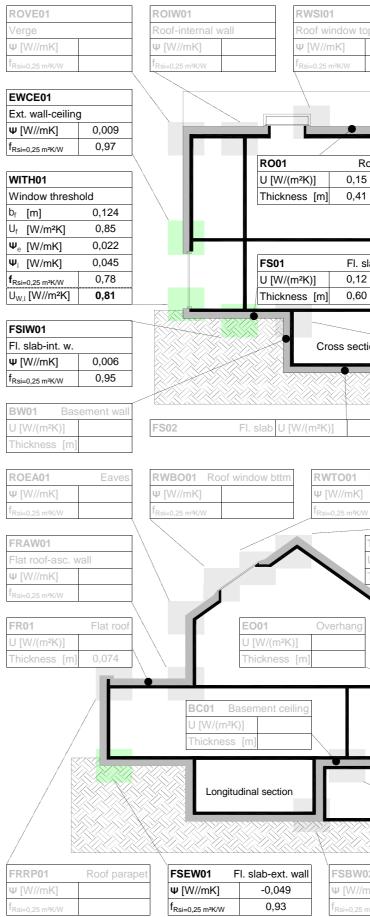
Airtightness concept

Airtightness of the system is achieved in the following way: windows and doors are installed with permanently elastic sealing materials and suitable airtight connection membranes and profiles. The interior of exterior wall surfaces are plastered over the entire surface, down to the unfinished floor and up to the unfinished ceiling. The interior of external walls for lightweight construction are covered over to the interior with continuous airtight membranes, with joints sealed using suitable airtightness tape.

Explanatory notes

The Passive House Institute has defined international component criteria for seven climate zones based on hygiene, comfort and affordability criteria. In principle, components which have been certified for climate zones with higher requirements may also be used in climates with less stringent requirements. Their use might make economic sense in certain circumstances.





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Light Steel Construction System | ID: 1380cs03

міто			Window to
Тур	01	02	03
b _f [m]	0,124		
U _f [W/m²K]	0,85		
Ψ _g [W/mK]	0,022		
Ψ _i [W/mK]	0,025		
f _{Rsi=0,25 m²K/W}	0,77	\٨/:-	
1 1	0.124	VVIr	ndow bottor
b _f [m] U _f [W/m²K]	0,124		
Ψ _q [W/mK]	0,022		
Ψ _g [W/mK]	0,022		
	0,76		
f _{Rsi=0,25 m²K/W} U _{W,i} [W//m²K]	0,85		
- w,i [0,00		
	BWBC0	1 Bsmni	wbsmnt
	Ψ [W//m		
	f _{Rsi=0,25} m	1	
	• KSI=U,25 M	TV VV	
	BWFS0	1 Bsm	int wfl. sla
	Ψ [W//m		
	f _{Rsi=0,25} m		
	. r.si=0,29 M	15/11	
	FSBW0 [°]	1 Fl. sl	ab-bsmnt v
	Ψ [W//m		
hickness [m]	f _{Rsi=0,25} m	2	
dow side	RORI01		Rida
dow side	RORI01 Ψ [W//m		Ridg
dow side			Ridg
	Ψ [W//m f _{Rsi=0,25 m}	²K/W	
Cold roof	Ψ [W//m f _{Rsi=0,25} m	2K/W	
	Ψ [W//m f _{Rsi=0,25 m}	²K/W K]	
Cold roof K)]	Ψ [W//m f _{Rsi=0,25 m} ROJU01 Ψ [W//m	²K/W K]	
Cold roof	Ψ [W//m f _{Rsi=0,25 m} ROJU01 Ψ [W//m	24//W K] 24//W	Junctio
Cold roof K)]	Ψ [W//m f _{Rsi=0,25} m ROJU01 Ψ [W//m f _{Rsi=0,25} m	K] K] 2K/W Cole	Junctio
Cold roof K)]	Ψ [W//m f _{Rsi=0,25} m ROJU01 Ψ [W//m f _{Rsi=0,25} m TCEA01	к] К] сок К]	Junctio
Cold roof K)]	Ψ [W//m f _{Rsi=0,25} m ROJU01 Ψ [W//m f _{Rsi=0,25} m TCEA01 Ψ [W//m f _{Rsi=0,25} m	к К] гкт К] гкт	Junctio
Cold roof	Ψ [W//m f _{Rsi=0,25} m ROJU01 Ψ [W//m f _{Rsi=0,25} m TCEA01 Ψ [W//m f _{Rsi=0,25} m EWE00	ку К] ком К] аку 1 Ext. w	Junctio
Cold roof K)]	Ψ [W//m f _{Rsi=0,25} m ROJU01 Ψ [W//m f _{Rsi=0,25} m TCEA01 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m	K] K[24K/W K] 24K/W 1 Ext. W/ K]	Junctio d roof-eave -0,047 0,90
Cold roof K)]	Ψ [W//m f _{Rsi=0,25} m ROJU01 Ψ [W//m f _{Rsi=0,25} m TCEA01 Ψ [W//m f _{Rsi=0,25} m EWE00	K] K[24K/W K] 24K/W 1 Ext. W/ K]	Junctio d roof-eave -0,047 0,90
Cold roof K)]	Ψ [W//m f _{Rsi=0,25} m ROJU01 Ψ [W//m f _{Rsi=0,25} m TCEA01 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m	K] RK/W Colu K] PK/W 1 Ext. w/ K] PK/W	Junctio
Cold roof K)]	Ψ [W//m f _{Rsi=0,25} m ROJU01 Ψ [W//m f _{Rsi=0,25} m TCEA01 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m	*KW K] *KW Cold K] *KW 1 Ext. w. K] *KW	Junctio
Cold roof K)]	Ψ [W//m f _{Rsi=0,25} m ROJU01 Ψ [W//m f _{Rsi=0,25} m TCEA01 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m	*K/W K] *K/W K] *K/W 1 Ext. w/K] *K/W	Junctio
Cold roof K)]	Ψ [W//m f _{Rsi=0,25} m ROJUO1 Ψ [W//m f _{Rsi=0,25} m TCEA01 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m	*K/W K] *K/W K] *K/W 1 Ext. w/K] *K/W	Junctio
Cold roof K)]	Ψ [W//m f _{Rsi=0,25} m ROJU01 Ψ [W//m f _{Rsi=0,25} m TCEA01 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m BCEW0	K] FK/W K] FK/W K] FK/W K] FK/W K] FK/W K] FK/W K] FK/W K] FK/W K] FK/W K] FK/W K] FK/W K] FK/W	Junctio
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Cold roof K)]	Ψ [W//m f _{Rsi=0,25} m ROJU01 Ψ [W//m f _{Rsi=0,25} m TCEA01 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m BCEW0	*K/W K] *K/W Cold K] *K/W 1 Ext. W/K] *K/W 2 Ext. W/K] *K/W 1 Bsmnt K]	Junctio
	Ψ [W//m f _{Rsi=0,25} m ROJUO1 Ψ [W//m f _{Rsi=0,25} m TCEA01 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m BCEW0 Ψ [W//m f _{Rsi=0,25} m	*K/W K] *K/W Cold *K/W *K/W *K/W *K/W *K/W *K/W *K/W *K/W *K/W	Junctio
Cold roof K)]	Ψ [W//m f _{Rsi=0,25} m ROJU01 Ψ [W//m f _{Rsi=0,25} m TCEA01 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m EWE00 Ψ [W//m f _{Rsi=0,25} m BCEW0 Ψ [W//m f _{Rsi=0,25} m	*K/W K] *K/W Colo K] *K/W 1 Ext. w K] *K/W 2 Ext. w K] *K/W 1 Bsmnt K] *K/W	Junctio

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