CERTIFICATE

Certified Passive House Component

ID: 1884cs04 valid until 31. December 2024

Passive House Institute
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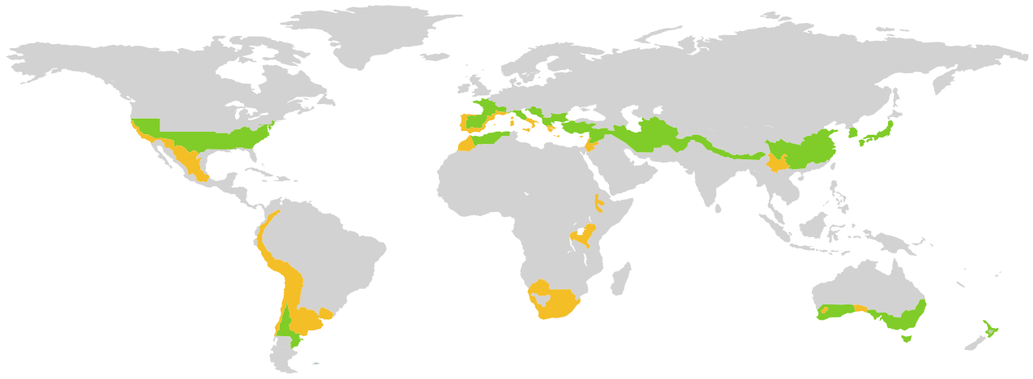
GERMANY



Catregory	**Construction system | Lightweigt timber Construction**
Manufacturer	**pro Passivhausfenster GmbH** **Oberaudorf** **GERMANY**
Product name	**smartshell timberframe Japan**

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

Hygiene criterion

The minimum temperature factor of the interior surfaces is	$f_{Rsi=0,25m^2K/W} \geq$	**0,65**

Comfort criterion

The U-value of the installed windows is	$U_{W,i} \leq$	**1,05** W/(m²K)

Efficiency criteria

Heat transfer coefficient of building envelope	$U*f_{PHI} \leq$	**0,30** W/(m²K)
Temperaturfactor of opaque junctions	$f_{Rsi=0,25m^2K/W} \geq$	**0,82**
Thermal bridge free design for key connection details	$\Psi \leq$	**0,01** W/(m²K)

An airtightness concept for all components and connection details was provided.

warm, temperate climate

CERTIFIED COMPONENT
Passive House Institute

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Opaque building envelope

The construction system is based on the most used Japanese earthquake-resistant timber construction. It is built on a concrete floor slab insulated by XPS and containing a 300 mm crawl space, which is containing installations and ventilation pipes.
The lightweight timber frame walls are constructed with solid studs at 45,5 cm centres with 9mm Japanese TBC plate to the outside and an installation area to the inside. An EPS layer with 100 mm forms the outside insulation, followed by organic compound plaster. The roof construction is formed with solid rafters at 92 cm spacings with 105 by 240 mm with 25 mm Japanese TBC plate to the outside and a 120 mm mineral wool insulation with 30 mm to 240 mm wooden slats to the inside. The false ceiling is made as a timber frame construction with a 300 mm free space for installation and ventilation pipes on bottom side.

Windows

The certification was done with the window smartwin with (1) tripple gllazing and (2) double glazing. Wall and window built a fusion. The window has no own outside layer as it is using the 9mm TBC board of the exterior wall for outside cladding. The shutter guide bar is forming the connection of TBC plate and exterior plaster.

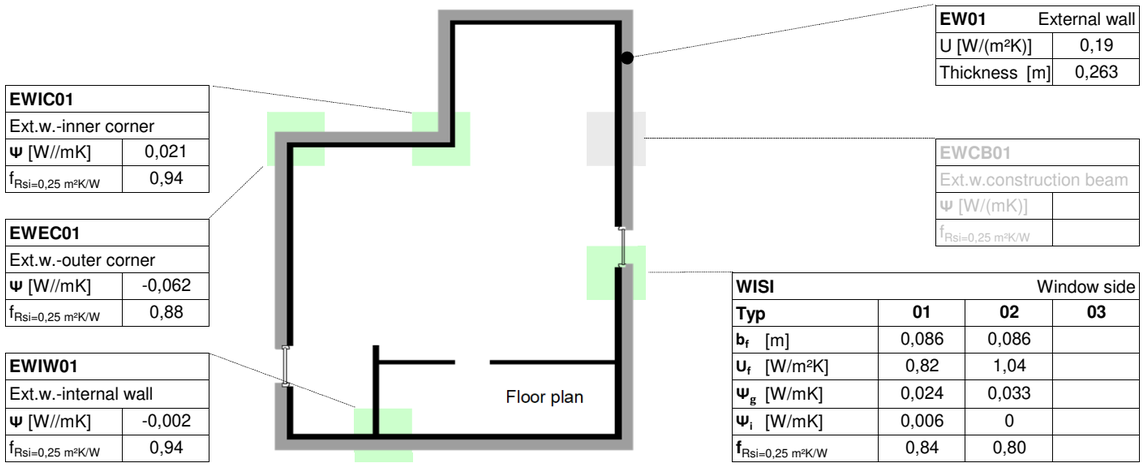
Airtightness concept

The airtight plane of the exterior wall is formed by an airtight membrane between the installation and the insulation level. Along the bottom ceiling the concrete forms the airtight plane. Along the roof the airtight plane is formed by an airtight membrane between the gypsum board and the insulation level.

Explainatory 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. This use might make sense in certain circumstances.

Thermal bridge not calculated
Criteria achieved
Efficieny driteria not achieved
Hygiene- or comfortcriterion not achieved



EWIC01	
Ext.w.-inner corner	
Ψ [W//mK]	0,021
$f_{Rsi=0,25\ m²K/W}$	0,94

EWEC01	
Ext.w.-outer corner	
Ψ [W//mK]	-0,062
$f_{Rsi=0,25\ m²K/W}$	0,88

EWIW01	
Ext.w.-internal wall	
Ψ [W//mK]	-0,002
$f_{Rsi=0,25\ m²K/W}$	0,94

EW01 External wall	
U [W/(m²K)]	0,19
Thickness [m]	0,263

EWCB01	
Ext.w.construction beam	
Ψ [W/(mK)]	
$f_{Rsi=0,25\ m²K/W}$	

WISI			Window side
Typ	**01**	**02**	**03**
b_f [m]	0,086	0,086	
U_f [W/m²K]	0,82	1,04	
$Ψ_g$ [W/mK]	0,024	0,033	
$Ψ_i$ [W/mK]	0,006	0	
$f_{Rsi=0,25\ m²K/W}$	0,84	0,80	

ROVE01	
Verge	
Ψ [W//mK]	-0,075
$f_{Rsi=0,25\ m²K/W}$	0,90

ROIW01	
Roof - internal wall	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

RWSI01	
Roof window top	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

WITO			Window top
Typ	**01**	**02**	**03**
b_f [m]	0,086	0,086	
U_f [W/m²K]	0,82	1,04	
$Ψ_g$ [W/mK]	0,024	0,033	
$Ψ_i$ [W/mK]	0,031	0,032	
$f_{Rsi=0,25\ m²K/W}$	0,80	0,74	

WIBO			Window bottom
b_f [m]	0,086	0,086	
U_f [W/m²K]	0,95	1,18	
$Ψ_g$ [W/mK]	0,024	0,034	
$Ψ_i$ [W/mK]	0,026	0,018	
$f_{Rsi=0,25\ m²K/W}$	0,80	0,73	
$U_{w,i}$ [W//m²K]	**1,00**	**1,21**	

EWCE01	
Ext.w.-ceiling	
Ψ [W//mK]	0,016
$f_{Rsi=0,25\ m²K/W}$	0,96

WITH01	
Window threshold	
b_f [m]	0,086
U_f [W/m²K]	0,95
$Ψ_e$ [W/mK]	0,030
$Ψ_i$ [W/mK]	0,054
$f_{Rsi=0,25\ m²K/W}$	0,80
$U_{w,i}$ [W//m²K]	**0,99**

RO01 Roof	
U [W/(m²K)]	0,12
Thickness [m]	0,398

FS01 Floor slab	
U [W/(m²K)]	0,42
Thickness [m]	0,230

FSIW01	
Fl.slab-intern.w	
Ψ [W//mK]	0,003
$f_{Rsi=0,25\ m²K/W}$	0,96

BW01 Basement wall	
U [W/(m²K)]	
Thickness [m]	

FS02 Floor slab	U [W/(m²K)]		Thickness [m]	

Cross section

BWBC01 Basem.w.-basem.c.	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

BWFS01 Basem.w.-floor slab	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

FSBW01 Fl.slab-basem.w.	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

ROEA01 Eaves	
Ψ [W//mK]	-0,040
$f_{Rsi=0,25\ m²K/W}$	0,90

RWBO01 Roof window bottom	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

RWTO01 Roof window side	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

RORI01 Ridge	
Ψ [W//mK]	-0,010
$f_{Rsi=0,25\ m²K/W}$	0,93

FRAW01	
Flat r. - asc. wall	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

TC01 Top ceiling	
U [W/(m²K)]	
Thickness [m]	

ROJU01 Junction	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

FR01 Flat roof	
U [W/(m²K)]	
Thickness [m]	

EO01 Overhang	
U [W/(m²K)]	
Thickness [m]	

TCEA01 Top ceiling - eaves	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

EWEO01 Ext.w. overhang	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

BC01 Basement ceiling	
U [W/(m²K)]	
Thickness [m]	

Longitudinal section

EWEO02 Ext.w. overhang	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

BCEW01 Basem.ce.-EW	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

FRRP01 Roof parapet	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

FSEW01 Floor slab-ext.w.	
Ψ [W//mK]	0,020
$f_{Rsi=0,25\ m²K/W}$	0,89

FSBW02 Fl.slab-basem.w.	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	

BCIW01 Basem.ce.-IW	
Ψ [W//mK]	
$f_{Rsi=0,25\ m²K/W}$	