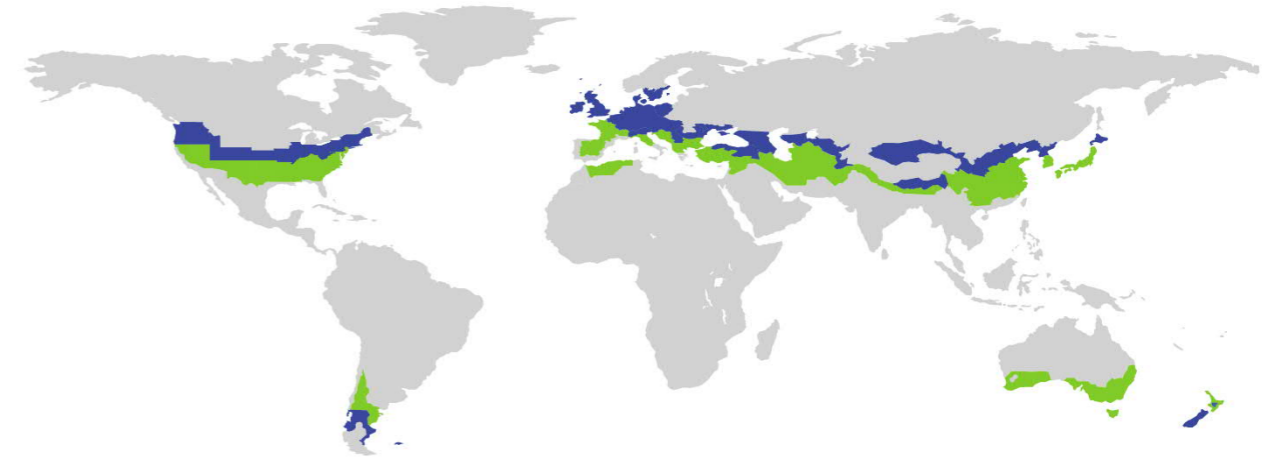


# CERTIFICATE

Certified Passive House Component

ID: 1465cs03 valid until 31. December 2021

Passive House Institute  
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GERMANY



Category **Construction system | Steel Construction**  
Manufacturer **Shenyang Jianzhu University  
Shenyang City  
CHINA**  
Product name **PLSC-EIFS Passivehouse system**

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

#### Hygiene criterion

The minimum temperature factor of the interior surfaces is

$$f_{R_{si}=0,25m^2K/W} \geq 0,70$$

#### Comfort criterion

The U-value of the installed windows is

$$U_{W,i} \leq 0,85 \text{ W}/(\text{m}^2\text{K})$$

#### Efficiency criteria

Heat transfer coefficient of building envelope

$$U^*f_{PHI} \leq 0,15 \text{ W}/(\text{m}^2\text{K})$$

Temperaturfactor of opaque junctions

$$f_{R_{si}=0,25m^2K/W} \geq 0,86$$

Thermal bridge free design for key connection details

$$\Psi \leq 0,01 \text{ W}/(\text{m}^2\text{K})$$

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

cool, temperate climate



**CERTIFIED  
COMPONENT**

Passive House Institute

**Opaque building envelope**

The construction system is built on reinforced-concrete foundations and supported by a light steel structure (steel stud 90 mm width at 63 cm centres). The connection between foundations and steel structure is secured by M16 bolts placed every meter. The steel structure is enclosed between two OSB layers and surrounded by concrete mixed with EPS-beads (0.14 W/(mK); 400 kg/m3).

When the construction is higher than 3 floors, a heavy steel structure (I-beams and columns) is added to support the steel studs frame. This is designed not to interrupt the insulation layer. The structure is calibrated according to need after a load calculation. The details calculated take into account I-beams 500x300 and columns 400x400. The psi-value reported is considered to be on the safe side for cases where a lighter structure will be used. For heavier structures, a new thermal analysis could be necessary.

A graphite EPS layer (0.032 W/(mK); 200 mm) is applied on the outside.

The insulation layer is fixed through thermal bridge-free anchor bolts made of basalt fibres (BFRP) with PP (30% fiberglass). Their effect has been calculated and is taken into account in the U-value, to the sum of 5/m² according to the information from the manufacturer. Change in the environmental conditions may lead to a variation of the number of bolts needed per m².

The roof construction is made by a 300 mm XPS layer (0.038 W/(mK); 30 kg/m3) above a steel frame filled with ce-mented paste with EPS-particles (0.14 W/(mK); 400 kg/m3).

**Windows**

The certification was carried out with the PHI-certified window REHAU GENE0 PHZ from REHAU AG + Co, which is a pHB-class window with triple 16 mm argon glazing. The window is installed in the graphite-EPS layer and supported by steel anchors.

**Airtightness concept**

Calcium silicate boards are applied on the interior and taped to each other to guarantee the airtightness of the envelope. Gypsum plaster boards are then applied on the silicate ones, to hide the tapes.

**Additional note to the certification**

Due to the fact that their size and arrangement will be different for each construction project, steel column penetrations through the floor slab are not taken into account in this certification. Their effect will be significant on overall heat loss however and should be assessed on a case-by-case basis. The Passive House Institute will be able to provide further information and assistance on request.

Note that, in case of a light steel construction, this detail will not subsist.

Thermal bridge not calculated  
Criteria achieved

Efficiency criteria not achieved  
Hygiene- or comfort criteria not achieved

