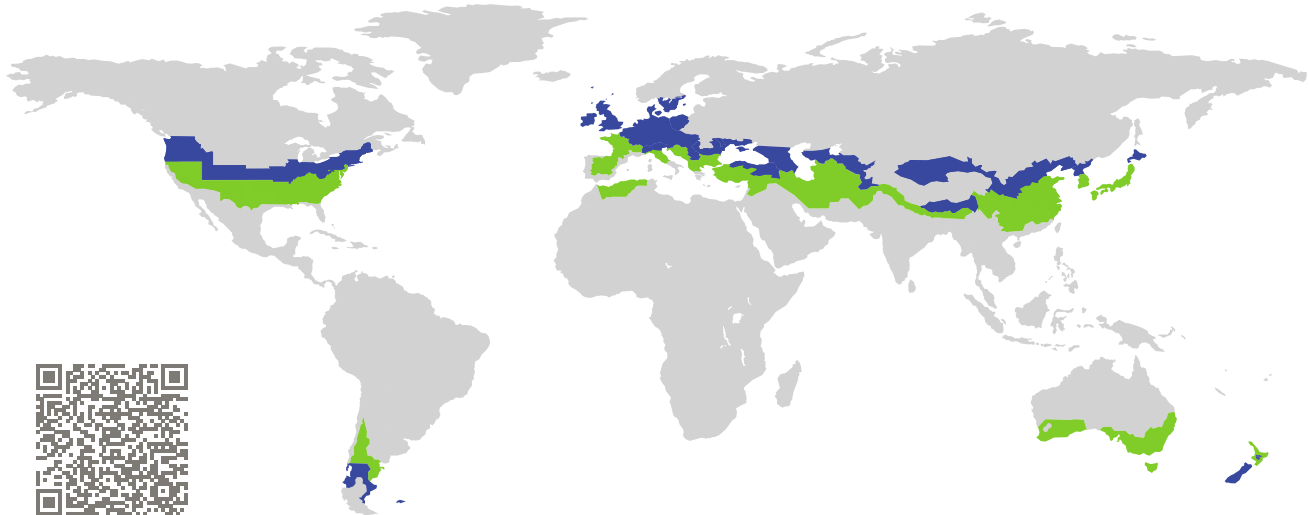


CERTIFICATE

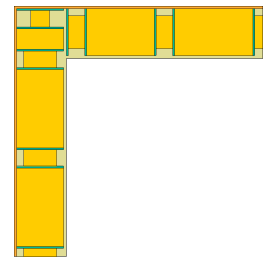
Certified Passive House Component

Component-ID 2582cs03 valid until 31st December 2026

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany



Category: **Construction system**
Manufacturer: **Biobuilds S.R.L.,
Moreni,
Romania**
Product name: **Modular**



Hygiene criterion

The minimum temperature factor of the interior surfaces is

$$f_{Rsi=0.25\text{m}^2\text{K/W}} \geq 0.70$$

Comfort criterion

The U-value of the installed windows is

$$U_{wi} \leq 0.85 \text{ W}/(\text{m}^2 \text{ K})$$

Efficiency criteria

Heat transfer coefficient of building envelope:

$$U * f_{PHI} \leq 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

Temperature factor of opaque junctions:

$$f_{Rsi=0.25\text{m}^2\text{K/W}} \geq 0.86$$

Thermal bridge-free design for key connection details:

$$\Psi \leq 0.01 \text{ W}/(\text{m K})$$

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

It was confirmed that the structure will dry out within 12 months and there is no risk of moisture-related damage.

cool, temperate climate



**CERTIFIED
COMPONENT**

Passive House Institute

Opaque building envelope

Modular is a lightweight modular timber construction system, insulated with wood fibre (Steicoflex 0,038 W/(mK)). The modules are fastened together using steel bolts and then covered with a weathertight membrane, before being clad with a timber rainscreen and roofing materials. The system is prefabricated in Biobuilds' manufacturing facility, allowing for fast delivery and assembly times. The construction is deemed suitable for passive houses, as both the regular U-values of the exterior components are at or below 0.15 W/(m²K) and the connections meet the criteria of 'thermal bridge-free'. The surface temperatures of all connections meet the surface temperature requirements.




Windows

Analysis was undertaken using a generic, passive house standard timber frame, triple-glazed window unit, featuring pH A thermal values for the spacer and a polysulfide secondary seal. The calculations undertaken demonstrate that the window installation locations are suited to the cool-temperate climate zone, with no risk of surface condensation or subsequent mould growth.





Airtightness concept

The Modular system uses 18mm thick AGE PAN OSB boards to the inside, taped with proprietary airtightness tape. To the exterior, the modules are covered with Solitex Fronta Quattro FB membrane membrane; Nail Plaster Sealant Tape is applied over all fixings.





Summary of values

Opaque assemblies		U-value W/(m ² K)	Thickness mm
Exterior wall	(EW1) 	0.15	334
Flat roof	(FR1) 	0.15	336
Floor slab	(FS1) 	0.15	336


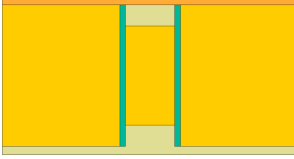

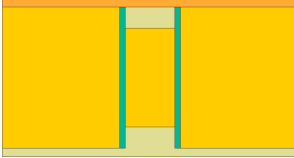

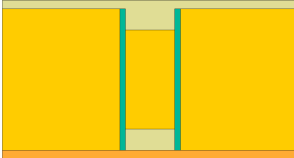
Frame cuts with "Standard window - cool-temperate" from "dummy window manufacturer" (0002)

Frame values		Frame width b_f mm	U -value frame U_f W/(m ² K)	Ψ -glazing edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Bottom	(OB1) 	100	0.89	0.028	0.69
Head	(OH1) 	100	0.76	0.028	0.71
Jamb	(OJ1) 	100	0.76	0.028	0.71
Threshold	(OT1) 	100	0.98	0.032	0.65
Spacer: PHI phA Spacer			Secondary seal: Polysulfide		

Junctions		U1	U2	U3	Ψ -value Ψ W/(m K)	Temp. factor $f_{RSI=0.25}$ [-]
Ceiling integration into exterior wall (EW1_EW1_CE_1)		0.15	0.15		0.052	0.886
Exterior corner exterior wall (EW1_EW1_ec_1)		0.15	0.15		-0.048	0.852
Interior corner exterior wall (EW1_EW1_ic_1)		0.15	0.15		0.044	0.943
Internal wall integration into exterior wall (EW1_EW1_IW_1)		0.15	0.15		-0.001	0.936
Panel joint exterior wall (EW1_EW1_pj_1)		0.15	0.15		0.019	0.931
Roof parapet flat roof (EW1_FR1_rp_1)		0.15	0.15		-0.045	0.858
Roof parapet flat roof (EW1_FR1_rp_2)		0.15	0.15		-0.053	0.869
Window bottom operable window in exterior wall (EW1_OB1_1)		0.15	0.89		0.020	0.787
Window bottom operable window in exterior wall (EW1_OB1_2)		0.15	0.89		0.050	0.734
Window head operable window in exterior wall (EW1_OH1_2)		0.15	0.76		-0.005	0.815
Window head operable window in exterior wall (EW1_OH1_2)		0.15	0.76		0.014	0.811
Window jamb operable window in exterior wall (EW1_OJ1_1)		0.15	0.76		0.015	0.818
Internal wall integration into flat roof (FR1_FR1_IW_1)		0.15	0.15		-0.001	0.933
Panel joint flat roof (FR1_FR1_pj_1)		0.15	0.15		0.033	0.923
Threshold to floor slab (FS1_EW1_OT1_1)		0.15	0.15	0.98	0.052	0.730
Threshold to floor slab (FS1_EW1_OT1_2)		0.15	0.15	0.98	0.024	0.756

Junctions		U1	U2	U3	Ψ -value Ψ W/(m K)	Temp. factor $f_{Rsi=0.25}$ [-]
Exterior wall plinth on floor slab (FS1_EW1_1)		0.15	0.15		-0.046	0.858
Exterior wall plinth on floor slab (FS1_EW1_2)		0.15	0.15		-0.051	0.862
Internal wall integration into floor slab (FS1_FS1_IW_1)		0.15	0.15		-0.001	0.933
Panel joint floor slab (FS1_FS1_pj_2)		0.15	0.15		0.033	0.922

Opaque Assemblies

	Exterior wall (EW1)	Material	Lambda W/(m K)	Thickness (mm)
		Softwood / OSB (ISO 10456)	0.130	18
		Timber + Steicoflex 036/038	0.049	300
		AGEPAN DWD Protect 090	0.090	16
		Total thickness: 334 mm		
		Rsi: 0.13 m ² K/W		
		Rse: 0.13 m ² K/W		
	U-value: 0.15 W/(m ² K)			
	Flat roof (FR1)	Material	Lambda W/(m K)	Thickness (mm)
		Softwood / OSB (ISO 10456)	0.130	18
		Timber + Steicoflex 036/038	0.049	300
		AGEPAN DWD Protect 090	0.090	18
		Total thickness: 336 mm		
		Rsi: 0.10 m ² K/W		
		Rse: 0.10 m ² K/W		
	U-value: 0.15 W/(m ² K)			
	Floor slab (FS1)	Material	Lambda W/(m K)	Thickness (mm)
		Softwood / OSB (ISO 10456)	0.130	18
		Timber + Steicoflex 036/038	0.049	300
		AGEPAN DWD Protect 090	0.090	18
		Total thickness: 336 mm		
		Rsi: 0.17 m ² K/W		
		Rse: 0.04 m ² K/W		
	U-value: 0.15 W/(m ² K)			



Bottom

$b_f = 100 \text{ mm}$
 $U_f = 0.89 \text{ W}/(\text{m}^2 \text{ K})$
 $\Psi_g = 0.028 \text{ W}/(\text{m K})$
 $f_{Rsi} = 0.69$



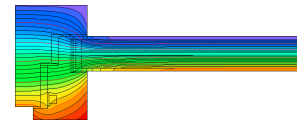
Head

$b_f = 100 \text{ mm}$
 $U_f = 0.76 \text{ W}/(\text{m}^2 \text{ K})$
 $\Psi_g = 0.028 \text{ W}/(\text{m K})$
 $f_{Rsi} = 0.71$



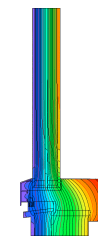
Jamb

$b_f = 100 \text{ mm}$
 $U_f = 0.76 \text{ W}/(\text{m}^2 \text{ K})$
 $\Psi_g = 0.028 \text{ W}/(\text{m K})$
 $f_{Rsi} = 0.71$



Threshold

$b_f = 100 \text{ mm}$
 $U_f = 0.98 \text{ W}/(\text{m}^2 \text{ K})$
 $\Psi_g = 0.032 \text{ W}/(\text{m K})$
 $f_{Rsi} = 0.65$





Ceiling integration

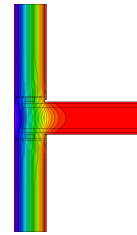
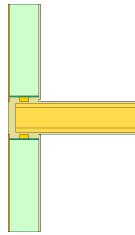
into exterior wall
(EW1_EW1_CE_1)

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = \mathbf{0.052 \text{ W}/(\text{m K})}$$

$$f_{Rsi} = 0.886$$



Exterior corner

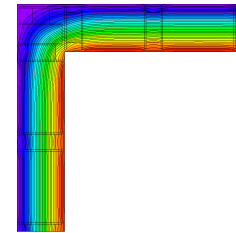
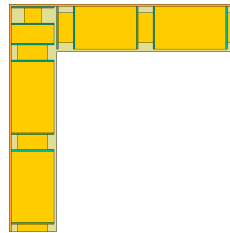
exterior wall (EW1_EW1_ec_1)

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = -0.048 \text{ W}/(\text{m K})$$

$$f_{Rsi} = \mathbf{0.852}$$



Interior corner

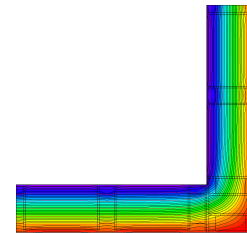
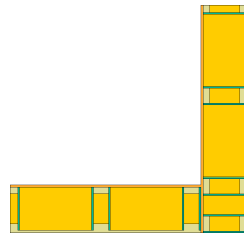
exterior wall (EW1_EW1_ic_1)

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = 0.044 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.943$$



Internal wall integration

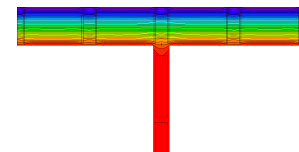
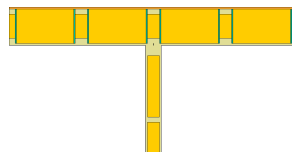
into exterior wall (EW1_EW1_IW_1)

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = -0.001 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.936$$



Panel joint

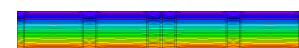
exterior wall (EW1_EW1_pj_1)

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = \mathbf{0.019 \text{ W}/(\text{m K})}$$

$$f_{Rsi} = 0.931$$





Roof parapet

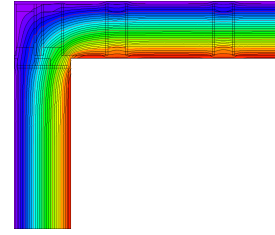
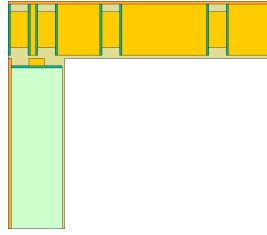
flat roof (EW1_FR1_rp_1)

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{FR1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = -0.045 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.858$$



Roof parapet

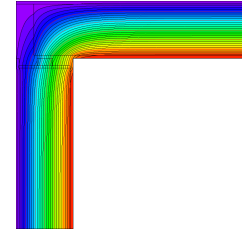
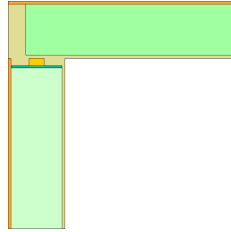
flat roof (EW1_FR1_rp_2)

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{FR1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = -0.053 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.869$$



Window bottom

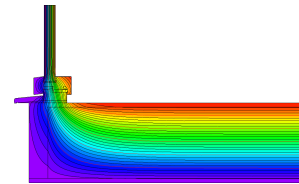
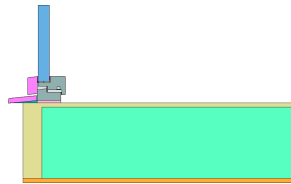
operable window in exterior wall (EW1_OB1_1)

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{OB1} = 0.89 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = 0.020 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.787$$



Window bottom

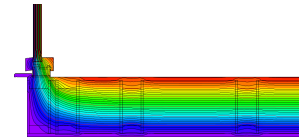
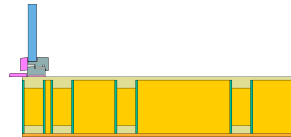
operable window in exterior wall (EW1_OB1_2)

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{OB1} = 0.89 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = 0.050 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.734$$



Window head

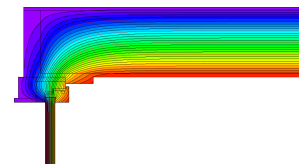
operable window in exterior wall (EW1_OH1_2)

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{OH1} = 0.76 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = -0.005 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.815$$





Window head

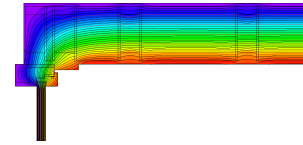
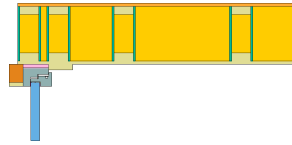
operable window in exterior wall (EW1_OH1_2)

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{OH1} = 0.76 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = 0.014 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.811$$



Window jamb

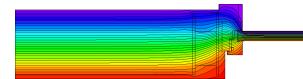
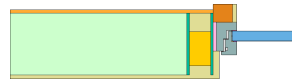
operable window in exterior wall (EW1_OJ1_1)

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{OJ1} = 0.76 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = 0.015 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.818$$



Internal wall integration

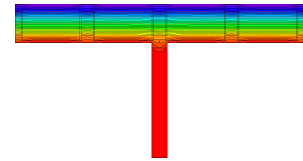
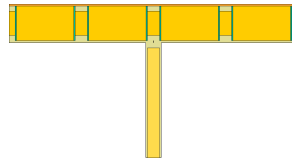
into flat roof (FR1_FR1_IW_1)

$$U_{FR1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{FR1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = -0.001 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.933$$



Panel joint

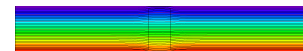
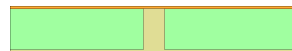
flat roof (FR1_FR1_pj_1)

$$U_{FR1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{FR1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = 0.033 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.923$$



Threshold

to floor slab (FS1_EW1_OT1_1)

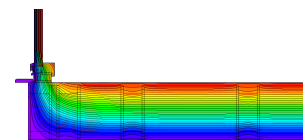
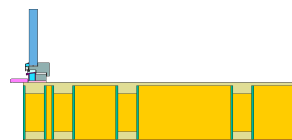
$$U_{FS1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{OT1} = 0.98 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = 0.052 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.730$$





Threshold

to floor slab (FS1_EW1_OT1_2)

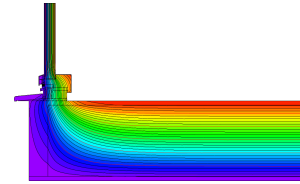
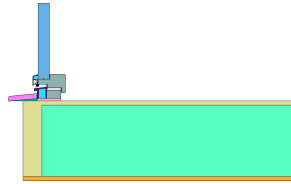
$$U_{FS1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{OT1} = 0.98 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = 0.024 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.756$$



Exterior wall plinth

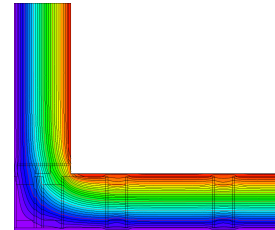
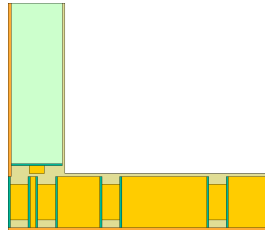
on floor slab (FS1_EW1_1)

$$U_{FS1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = -0.046 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.858$$



Exterior wall plinth

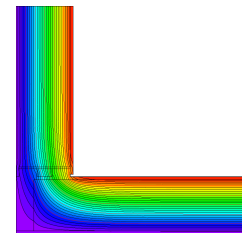
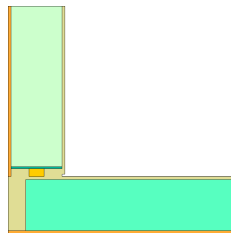
on floor slab (FS1_EW1_2)

$$U_{FS1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{EW1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = -0.051 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.862$$



Internal wall integration

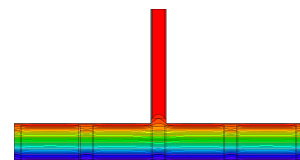
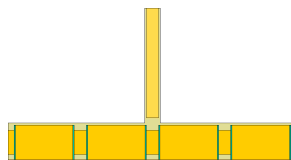
into floor slab (FS1_FS1_IW_1)

$$U_{FS1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{FS1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = -0.001 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.933$$



Panel joint

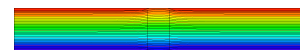
floor slab (FS1_FS1_pj_2)

$$U_{FS1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$U_{FS1} = 0.15 \text{ W}/(\text{m}^2 \text{ K})$$

$$\Psi = 0.033 \text{ W}/(\text{m K})$$

$$f_{Rsi} = 0.922$$



Disclaimer: The Passive House Institute GmbH (PHI) carries out heat transfer analyses according to the standards set out in the document "[Criteria and Algorithms for Certified Passive House Components: Opaque Construction Systems](#)" and based on information provided by the manufacturer. It is the responsibility of the project leader, e.g. the architect to ensure the appropriate assessments have been carried out for specific buildings, which may include more detailed analyses than those carried out for this certification. Use of a certified Passive House component does not guarantee that a construction project will achieve the [Passive House, EnerPHit or PHI Low Energy Building standard](#). In all cases full details are to be made available by the manufacturer on request to the engaged certified Passive House designer or certifier, who will be permitted to check these against the construction information and to perform on-site checks as part of the quality assurance process.