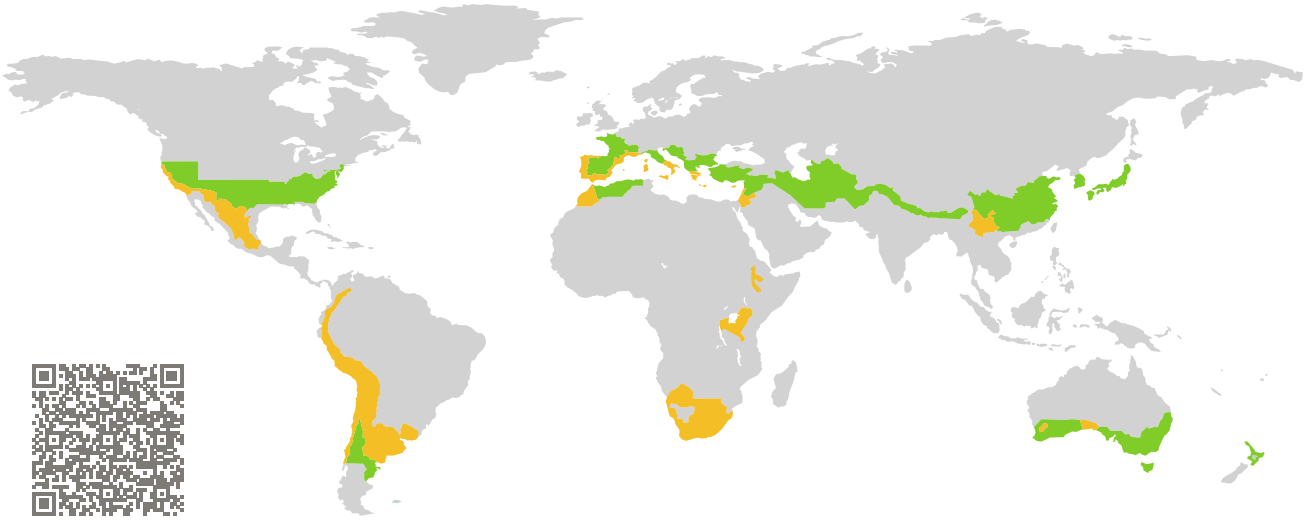
CERTIFICATE

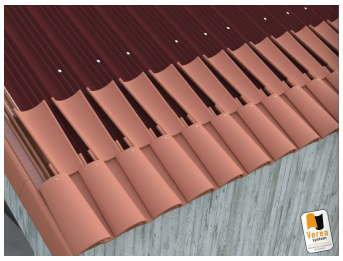
Certified Passive House Component

Component-ID 2420rc04 valid until 31st December 2025

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany



Category:	**Construction system**
Manufacturer:	**TEJAS VEREA S.A.U., A Coruña, Spain**
Product name:	**VEREA SYSTEM®**



Hygiene criterion

The mininum temperature factor of the interior surfaces is $f_{Rsi=0.25\,m^2\,K/W} \geq 0.65$

Comfort criterion

The U-value of the installed windows is $U_{wi} \leq 1.05\,W/(m^2\,K)$

Efficiency criteria

Heat transfer coefficient of building envelope: $U * f_{PHI} \leq 0.25\,W/(m^2\,K)$

Temperature factor of opaque junctions: $f_{Rsi=0.25\,m^2\,K/W} \geq 0.82$

Thermal bridge-free design for key connection details: $\Psi \leq 0.01\,W/(m\,K)$

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.

warm, temperate climate

CERTIFIED COMPONENT

Passive House Institute

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Opaque building envelope

The VEREA SYSTEM® roofing system consists of a unidirectional hollow-core slab with a 15 mm interior gypsum plaster layer, on which a 120 mm PIR insulation (0.027 W/m·K) and a 19 mm thick wooden board are placed. On top of the wooden board, the Verea system is installed, which includes a 140 g/m² vapor barrier (Sd>2m), an Onduline BT150Plus bituminous corrugated sheet, and Verea curved ceramic tiles in sizes 40x20, 45x20, and 50x21, and Spanish S tiles, along with their special components.
The installation of the corrugated sheet and ceramic tiles, as well as the execution of specific roofing details (eaves, side trims, ridges, and valleys), must be carried out following the guidelines of Technical Suitability Document No. 622p/22.
As a multilayer system, the VEREA SYSTEM® ensures both thermal insulation and waterproofing of the roof, reducing construction time and minimizing execution errors on-site. Thanks to the ventilated layer created on the exterior side of the thermal insulation, as well as the micro-ventilation beneath the tiles, the system enhances the hygrothermal performance of the roof and the durability of all ceramic components, while also ensuring the stability of all roofing elements even under the most adverse climatic conditions.

Windows

For certification purposes, the Passive House-certified skylight FTT U8 Thermo 2012 from FAKRO (Uw = 0.88 W/(m²K), with Ug = 0.70 W/(m²K)) was utilized. To ensure optimal occupant comfort, the overall U-value of the installed skylight (Uw,inst) for a standard reference size of 1.14 m × 1.40 m must not exceed 1.10 W/(m²K). This performance is achieved through a mounting system, securely anchored to the slab. The mounting system is composed of ISO-TOP WF3 from THERMAPOR, a high-performance material with a thermal conductivity of 0.040 W/(m·K), a width of 60 mm, and a height of 120 mm. The skylight is positioned in alignment with the exterior thermal insulation, ensuring the continuity of the thermal envelope. As a result, the Passive House comfort criterion is successfully met in this configuration.

Airtightness concept

The airtightness of the system is achieved as follows: The airtight layer of the roof slab is the interior gypsum plaster layer. The airtight connection with the skylights is ensured using special airtightness tapes on the interior side, maintaining continuity with the gypsum plaster of the slab. All junctions with other construction elements are sealed while maintaining continuity at the joints with special tapes or airtight paint solutions, ensuring that the airtightness line of the roof remains in the interior gypsum plaster layer.

Summary of values

Opaque assemblies	U-value W/(m² K)	Thickness mm
exterior wall (EW1) 	0.20	425
pitched roof (RO1) 	0.20	439

Frame Cuts with ”FTT U8 Thermo 2012” from ”FAKRO PP sp. z o.o.” (0473rw03)					
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)		112	1.10	0.034	0.70
Top	(OH1)		95	1.08	0.034	0.70
Lateral	(OJ1)		92	1.11	0.037	0.70
Spacer: TGI			Secondary seal: Polysulfide			

Junctions		U1 U2 W/(m² K)	Ψ-value Ψ W/(m K)	Temp. factor $f_{Rsi=0.25}$ [-]
Roof eave pitched roof (EW1_RO1_ea_1)		0.20 0.20	0.000	0.881
Roof verge pitched roof (EW1_RO1_ve_1)		0.20 0.20	–0.026	0.862
Roof window bottom in pitched roof (RO1_OB1_1)		0.20 1.10	0.061	0.703
Roof window head in pitched roof (RO1_OH1_1)		0.20 1.08	0.073	0.682
Roof window jamb in pitched roof (RO1_OJ1_1)		0.20 1.11	0.075	0.749
Roof ridge pitched roof (RO1_RO1_ri_1)		0.20 0.20	–0.018	0.922

Opaque Assemblies

exterior wall (EW1)

Material	Lambda W/(m K)	Thickness (mm)
EPS 035	0.035	140
Mortar	1.000	5
EQ_EW1: Thermoclay blocks 19 cm + mortar be joints	0.325	190
Interior plaster	0.570	15
EQ_EW1: Air layer, unventilated, horizontal, thic ness 60 mm + Steel studs	0.361	60
Gypsum board | 900 kg/m³ 10456	0.250	15

Total thickness: 425 mm
Rsi: 0.13 m^2 K/W
Rse: 0.04 m^2 K/W
U-value: 0.20 W/(m^2 K)

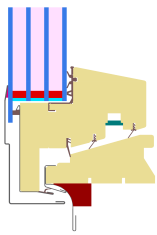
pitched roof (RO1)

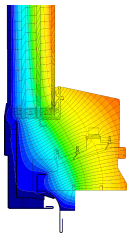
Material	Lambda W/(m K)	Thickness (mm)
Softwood, OSB	0.130	19
Onduline PIR 027	0.027	120
Reinforced concrete slab with ceramic filler blocks	0.938	300

Total thickness: 439 mm
Rsi: 0.10 m^2 K/W
Rse: 0.10 m^2 K/W
U-value: 0.20 W/(m^2 K)

Bottom

b_f = 112 mm
U_f = 1.10 W/(m^2 K)
Ψ_g = 0.034 W/(m K)
f_{Rsi} = 0.70





Top

b_f = 95 mm
U_f = 1.08 W/(m^2 K)
Ψ_g = 0.034 W/(m K)
f_{Rsi} = 0.70

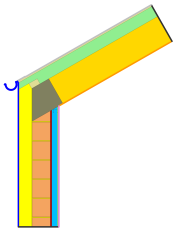
Lateral

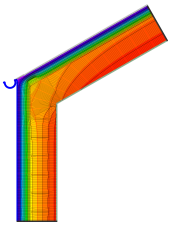
b_f = 92 mm
U_f = 1.11 W/(m^2 K)
Ψ_g = 0.037 W/(m K)
f_{Rsi} = 0.70

Roof eave

pitched roof (EW1_RO1_ea_1)

U_{EW1} = 0.20 W/(m² K)
U_{RO1} = 0.20 W/(m² K)
Ψ = 0.000 W/(m K)
f_{Rsi} = 0.881

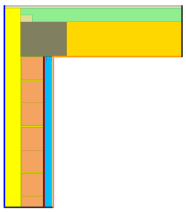


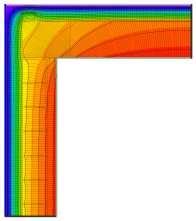


Roof verge

pitched roof (EW1_RO1_ve_1)

U_{EW1} = 0.20 W/(m² K)
U_{RO1} = 0.20 W/(m² K)
Ψ = –0.026 W/(m K)
f_{Rsi} = 0.862

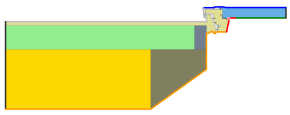


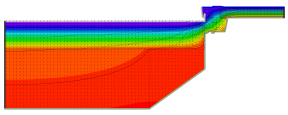


Roof window bottom

in pitched roof (RO1_OB1_1)

U_{RO1} = 0.20 W/(m² K)
U_{OB1} = 1.10 W/(m² K)
Ψ = 0.061 W/(m K)
f_{Rsi} = 0.703

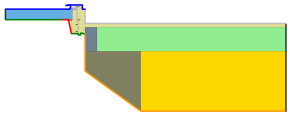


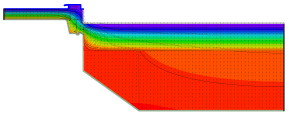


Roof window head

in pitched roof (RO1_OH1_1)

U_{RO1} = 0.20 W/(m² K)
U_{OH1} = 1.08 W/(m² K)
Ψ = 0.073 W/(m K)
f_{Rsi} = 0.682

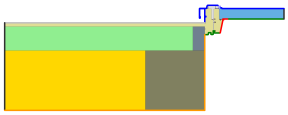


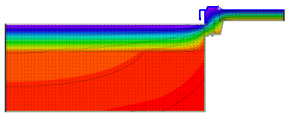


Roof window jamb

in pitched roof (RO1_OJ1_1)

U_{RO1} = 0.20 W/(m² K)
U_{OJ1} = 1.11 W/(m² K)
Ψ = 0.075 W/(m K)
f_{Rsi} = 0.749





Roof ridge

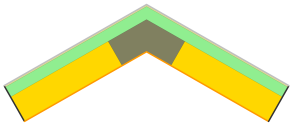
pitched roof (RO1_RO1_ri_1)

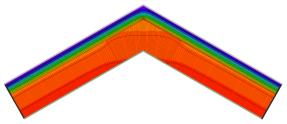
U_{RO1} = 0.20 W/(m² K)

U_{RO1} = 0.20 W/(m² K)

Ψ = –0.018 W/(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.