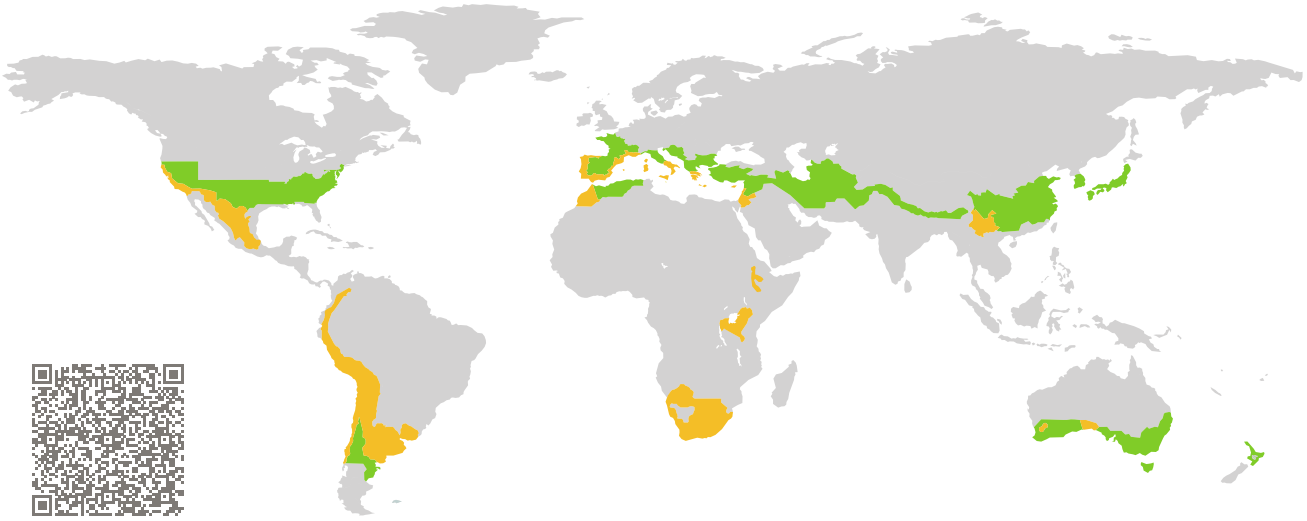
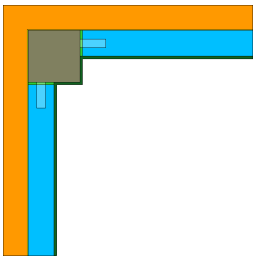
CERTIFICATE

Certified Passive House Component

Component-ID 2323cs04 valid until 31st December 2025

Passive House Institute
Dr. Wolfgang Feist
64283 Darmstadt
Germany





Category:	**Construction system**
Manufacturer:	**XELLA Thermopierre S. A., Bourgoin-Jallieu Cdx, France**
Product name:	**YTONG - URSA External Wall Ventilated Façade 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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☎ +34 610437495 | ✉ tecnico.e@xellaspain.com | http://www.xella.es |

Opaque building envelope

The Ytong-Ursa system is designed for ventilated facades, which combines Ytong cellular concrete blocks with a density of 500kg/m3 and a thickness of 15cm as support for the enclosure, along with a 14cm thick layer of Ursa Terra Vento Plus T0003 mineral wool insulation. As an exterior finishing skin, a ventilated façade is fixed with Ejot type anchors, maintaining a 3cm air chamber between the mineral wool and the exterior solution of the ventilated façade. We achieve a light, efficient and quick-to-execute façade, very insulating and with many possibilities for aesthetic finishes.

Windows

The certification was carried out with a Passivhaus-suitable standard window, that has a Uw-value of 1,00 W/(m²K), using a Ug-value of 0,90 W/(m²K). The window is installed in the structural layer, rather than the insulation layer, which is not typical for Passivhaus construction. This is feasible in this case, as the YTONG structural blocks also have a strong insulating effect, due to their low thermal conductivity (0,16 W/(mK)).

Airtightness concept

The Ytong blocks have been tested and guarantee air tightness, but the tightness between the joints depends greatly on the installation. To ensure airtight behavior of the whole system, the manufacturer recommends that an airtight layer with 1.5cm of plaster be applied to the walls on the inside. Also its advisable to apply a liquid membrane at the junctions between construction elements that are most susceptible to movement, and the use of sealing sheets at the junctions with the windows, in addition to ensuring the sealing of all ducts with cuffs suitable for that purpose.

Summary of values

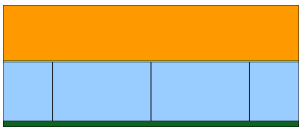
Opaque assemblies		U-value W/(m² K)	Thickness mm
exterior wall	(EW1) 	0.18	310
flat roof	(FR1) 	0.23	440
floor slab	(FS1) 	0.31	390

Frame Cuts with ”dummy wood window warm-temperate” from ”dummy window manufacturer” (0004)					
Frame values			Frame width b_f mm	U-value frame U_f W/(m² K)	Ψ-glazing edge Ψ_g W/(m K)	Temp. Factor $f_{Rsi=0.25}$ [-]
Bottom	(OB1)		125	0.92	0.038	0.70
Top	(OH1)		125	0.92	0.038	0.70
Lateral	(OJ1)		125	0.92	0.038	0.70
Threshold	(OT1)		125	0.92	0.038	0.70
Spacer: PHI phB-Spacer				Secondary seal: Polysulfide		

Junctions	U1 U2 U3 W/(m² K)	Ψ-value Ψ W/(m K)	Temp. factor $f_{Rsi=0.25}$ [-]
Construction beam in exterior wall (EW1_EW1_cb_1) 	0.18 0.18	0.016	0.954
Ceiling integration into exterior wall (EW1_EW1_CE_1) 	0.18 0.18	0.017	0.951
Exterior corner exterior wall (EW1_EW1_ec_1) 	0.18 0.18	–0.022	0.895
Interior corner exterior wall (EW1_EW1_ic_1) 	0.18 0.18	0.024	0.955
Internal wall integration into exterior wall (EW1_EW1_IW_1) 	0.18 0.18	0.000	0.955
Roof parapet flat roof (EW1_FR1_rp_1) 	0.18 0.23	–0.022	0.863
Window bottom operable window in exterior wall (EW1_OB1_1) 	0.18 0.92	0.040	0.793
Window head operable window in exterior wall (EW1_OH1_1) 	0.18 0.92	0.017	0.819
Window jamb operable window in exterior wall (EW1_OJ1_1) 	0.18 0.92	0.011	0.816
Threshold to floor slab (FS1_EW1_OT1_1) 	0.31 0.18 0.92	–0.057	0.768
Exterior wall plinth on floor slab (FS1_EW1_1) 	0.31 0.18	–0.022	0.872

Opaque Assemblies

exterior wall (EW1)



Material	Lambda W/(m K)	Thickness (mm)
Plaster (ISO 10456)	0.800	15
Ytong blocks (plus mortar, equivalent value)	0.164	150
Mortar (ISO 10456)	1.000	5
URSA TERRA Vento Plus mineral wool (rated valu according to DIN 4108)	0.033	140

Total thickness: 310 mm
Rsi: 0.13 m^2 K/W
Rse: 0.13 m^2 K/W
U-value: 0.18 W/(m^2 K)

flat roof (FR1)

Material	Lambda W/(m K)	Thickness (mm)
Ceramic floor slab (lambda value calculation accor ing to Energiehaus)	1.237	300
URSA XPS N-III (rated value according to DIN 410	0.036	140

Total thickness: 440 mm
Rsi: 0.10 m^2 K/W
Rse: 0.04 m^2 K/W
U-value: 0.23 W/(m^2 K)

floor slab (FS1)

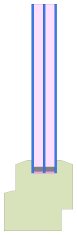
Material	Lambda W/(m K)	Thickness (mm)
Plastic floor covering (ISO 10456)	0.250	20
Underlay, porous rubber or plastic (ISO 10456)	0.100	15
Cement screed (DIN 4108)	1.400	55
Concrete with 1% steel (ISO 10456)	2.300	200
URSA XPS N-V L (rated value according to DI 4108)	0.037	100

Total thickness: 390 mm
Rsi: 0.17 m^2 K/W
Rse: - m^2 K/W
U-value: 0.31 W/(m^2 K)

Frame Cuts with ”dummy wood window warm-temperate” from ”dummy window manufacturer” (0004)

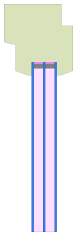
Bottom

b_f = 125 mm
U_f = 0.92 W/(m² K)
Ψ_g = 0.038 W/(m K)
f_{Rsi} = 0.70



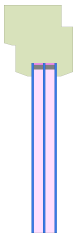
Top

b_f = 125 mm
U_f = 0.92 W/(m² K)
Ψ_g = 0.038 W/(m K)
f_{Rsi} = 0.70



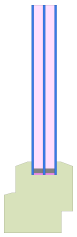
Lateral

b_f = 125 mm
U_f = 0.92 W/(m² K)
Ψ_g = 0.038 W/(m K)
f_{Rsi} = 0.70



Threshold

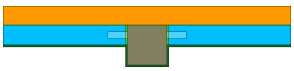
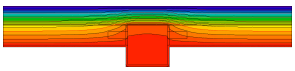
b_f = 125 mm
U_f = 0.92 W/(m² K)
Ψ_g = 0.038 W/(m K)
f_{Rsi} = 0.70



Construction beam

in exterior wall (EW1_EW1_cb_1)

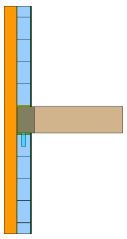
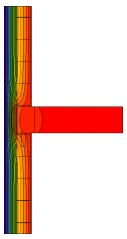
U_{EW1} = 0.18 W/(m² K)
U_{EW1} = 0.18 W/(m² K)
Ψ = 0.016 W/(m K)
f_{Rsi} = 0.954

Ceiling integration

into exterior wall (EW1_EW1_CE_1)

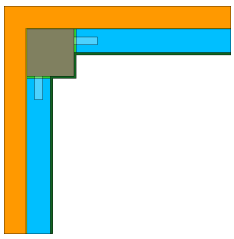
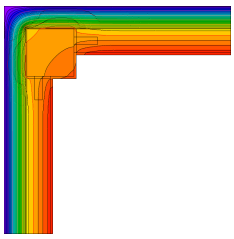
U_{EW1} = 0.18 W/(m² K)
U_{EW1} = 0.18 W/(m² K)
Ψ = 0.017 W/(m K)
f_{Rsi} = 0.951

Exterior corner

exterior wall (EW1_EW1_ec_1)

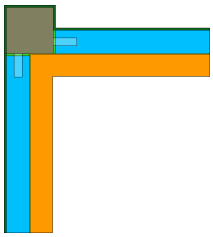
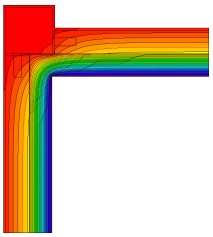
U_{EW1} = 0.18 W/(m² K)
U_{EW1} = 0.18 W/(m² K)
Ψ = –0.022 W/(m K)
f_{Rsi} = 0.895

Interior corner

exterior wall (EW1_EW1_ic_1)

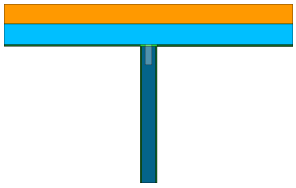
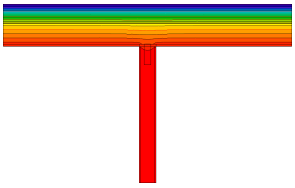
U_{EW1} = 0.18 W/(m² K)
U_{EW1} = 0.18 W/(m² K)
Ψ = 0.024 W/(m K)
f_{Rsi} = 0.955

Internal wall integration

into exterior wall (EW1_EW1_IW_1)

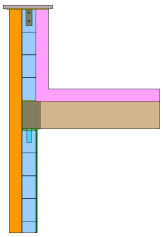
U_{EW1} = 0.18 W/(m² K)
U_{EW1} = 0.18 W/(m² K)
Ψ = 0.000 W/(m K)
f_{Rsi} = 0.955

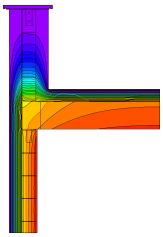



Roof parapet

flat roof (EW1_FR1_rp_1)

U_{EW1} = 0.18 W/(m² K)
U_{FR1} = 0.23 W/(m² K)
Ψ = –0.022 W/(m K)
f_{Rsi} = 0.863

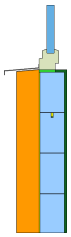


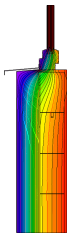


Window bottom

operable window in exterior wall (EW1_OB1_1)

U_{EW1} = 0.18 W/(m² K)
U_{OB1} = 0.92 W/(m² K)
Ψ = 0.040 W/(m K)
f_{Rsi} = 0.793

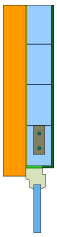




Window head

operable window in exterior wall (EW1_OH1_1)

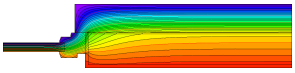
U_{EW1} = 0.18 W/(m² K)
U_{OH1} = 0.92 W/(m² K)
Ψ = 0.017 W/(m K)
f_{Rsi} = 0.819



Window jamb

operable window in exterior wall (EW1_OJ1_1)

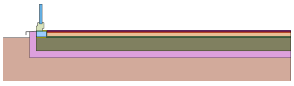
U_{EW1} = 0.18 W/(m² K)
U_{OJ1} = 0.92 W/(m² K)
Ψ = 0.011 W/(m K)
f_{Rsi} = 0.816

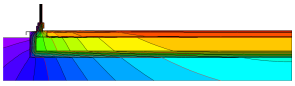


Threshold

to floor slab (FS1_EW1_OT1_1)

U_{FS1} = 0.31 W/(m² K)
U_{EW1} = 0.18 W/(m² K)
U_{OT1} = 0.92 W/(m² K)
Ψ = –0.057 W/(m K)
f_{Rsi} = 0.768





Exterior wall plinth

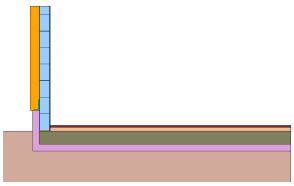
on floor slab (FS1_EW1_1)

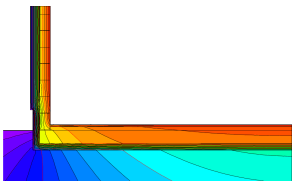
U_{FS1} = 0.31 W/(m^2 K)

U_{EW1} = 0.18 W/(m^2 K)

Ψ = –0.022 W/(m K)

f_{Rsi} = 0.872





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.