Can Mati, a historic farmhouse of peasant origin, in Viladecans, becomes the first Passivhaus-certified home in the city. The project allowed to maintain the existing structure and aspect of the building, while creating bright and generous spaces. It renews the envelope energetically, with efficient facilities, and a self-consumption photovoltaic installation. The house is now Passivhaus EnerPHit Classic certified.

The tightness reached a good value of n50=0.5 ren/h, which meets the Passivhaus criteria for new construction. Simple solutions have been applied, such as plastering and waterproofing of the roof. Sealing membranes have only been used occasionally.

External insulation has been applied where possible. For conservation purpose, the upper part of the main facade has been insulated with crushed cork insulation and Diatonite lime mortar from Diasen. The patio facade was insulated with rockwool SATE with Com Cal mortar. The horizontal elements were insulated with wood fiber, with the exception of a second layer of XPS insulation on the roof membrane to protect the construction from condensations. As a whole, the intervention reduces heating demand by 90% compared to the initial state.
See more details about this project


Data reliability

3rd part certified

Photo credit

Pol Viladoms

### Stakeholders

#### Contractor

**Name:** Construgiba SL

#### Stakeholders

**Function:** Thermal consultancy agency  
Praxis Resilient Buildings  
praxis[a]praxis-rb.com  
[https://praxis-rb.com/](https://praxis-rb.com/)  
Consulting & Passivhaus design; blower door essay

**Function:** Designer  
Daniel Tigges - Tigges Architekt  
[https://www.tiggesarchitekt.ch/](https://www.tiggesarchitekt.ch/)  
Architect, project editor & project manager

**Function:** Others  
Josep Maria Fosalba i Julià - Oftecnics  
Technical Architect / Director of Work Execution

**Function:** Others  
Instal.lacions R.B.G  
Installer company

**Function:** Developer

**Function:** Structures calculist  
Bernuz Fernandez SLP  
Structural calculation

**Function:** Certification company  
Energiehaus Arquitectos SLP  
Passivhaus certification company

**Function:** Manufacturer  
Zehnder  
[https://www.zehnder.es/](https://www.zehnder.es/)  
Manufacturer of the mechanical ventilation system with Passivhaus heat recovery

**Function:** Manufacturer  
Maderas Casas S.A  
Window manufacturing company
Function: Manufacturer
Diaz Fusters S.L.
Interior carpentry

Contracting method
Separate batches

Owner approach of sustainability
The objective of the promoters was to adapt an urban farmhouse in the historic center of Viladecans to the 21st century. Carefully rehabilitated, maintaining the existing substantial structure and wrapped with excellent thermal insulation, this building received the German Passivhaus EnerPHit certification. In addition to energy efficiency, the project considers indoor air quality, as well as the environmental impact of construction materials.

Building users opinion
High level of comfort both in winter and summer, with excellent indoor air quality, and very low energy bills.

Energy

Energy consumption
Primary energy need: 76,00 kWhpe/m².year
Primary energy need for standard building: 250,00 kWhpe/m².year
Calculation method: Other
Final Energy: 38,00 kWhfe/m².year
More information: Final energy consumption for all consumptions, calculated with PHPP v.9 of the Passivhaus Institut, is 38 kWh/m²-a.
Actual consumption measured during the year 2022 is 29 kWh/m²-a.

Envelope performance
Envelope U-Value: 0.41 W·m⁻²·K⁻¹
More information:
Exterior wall:
- 10mm lime mortar
- Rockwool RockSATE DUO Plus 120mm insulation
- Existing mortar 20mm
- Existing masonry wall 355mm
- Plaster plaster 15mm
U = 0.270 W/m² K

Deck:
- Gravels 50mm
- 100mm XPS insulation
- EPDM
- Pavitherm 100mm wood fiber insulation
- Existing ceramic vaults 90mm
- Plaster plaster 15mm
U = 0.190 W/m² K

Solera:
- 20mm soft ceramic flooring
- 10mm adhesive mortar
- 50mm mortar
- Rocksol E525 80mm stone wool insulation
- Hermetic and breathable sheet
- Gravels 100mm
U = 0.426 W/m² K

Windows:
- Esperia 89 - Sirio Alumino
- Triple glass: 44XN/18ARWE/4/18ARWE/4XN
- Skylight: Velux DOME
Uw = 0.88 W/m² K
Indicator : n50
Air Tightness Value : 0.50

Real final energy consumption
Real final energy consumption/m² : 29.00 kWhfe/m².year
Year of the real energy consumption : 2022

Renewables & systems

Systems

Heating system :
- Heat pump

Hot water system :
- Heat pump

Cooling system :
- Reversible heat pump
- Fan coil

Ventilation system :
- Natural ventilation
- Double flow heat exchanger

Renewable systems :
- Solar Thermal
- Heat pump

Renewable energy production : 50.00 %

Other information on HVAC :
Bomba de Calor Mitsubishi PUHZ-SW120VHA con Fancoil Mitsubishi i-LIFE2 HP 1002 y 1202
Zehnder ComfoAir 450 ERV
4.44 kWp photovoltaic generator; Zehnder ComfoAir 450 ERV heat recovery ventilation unit with Passivhaus component certification

Solutions enhancing nature free gains :
Great openings to the south

Environment

GHG emissions
GHG in use : 20.00 KgCO₂/m²/year
Methodology used :
PHPP & Missed
Building lifetime : 100.00 year(s)

Products

Product
Zehnder ComfoAir 450 ERV
Zehnder

Product category : Climatización / Ventilación, refrigeración

Costs
Reasons for participating in the competition(s)

The main challenge we face in the built environment is - precisely - the rehabilitation of the existing housing stock, to create healthy, comfortable homes with low energy consumption. The project shows a small example of what is possible within the scope of comprehensive energy rehabilitation, achieving a 90% reduction in heating demand compared to the initial state.

One of the strengths of the project was airtightness, where an excellent result of n50= 0.5 ren/h was achieved in the Blower Door test, meeting the Passivhaus criteria for new construction. Simple solutions have been applied and sealing membranes have only been used occasionally.

Building candidate in the category

Users’ Choice