


Can Mati – Viladecans (Spain)

by Oliver Style / 2023-02-22 00:00:00 / España / 212 / ES



Renovation

Primary energy need :

76 kWhpe/m².year

(Calculation method : Other)

ENERGY CONSUMPTION

Economical building

< 50	A
51 à 90	B
91 à 150	C
151 à 230	D
231 à 330	E
331 à 450	F
> 450	G

Energy-intensive building

Building

A

Building Type : Isolated or semi-detached house
Construction Year : 2021
Delivery year : 2021
Address 1 - street : C/ de Pi i Margall, 27 08840 VILADECANS, España
Climate zone : [Csb] Coastal Mediterranean - Mild with cool, dry summer.

Net Floor Area : 208 m² Superficie útil

Certifications :



General information

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 Diathonite 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

https://passivehouse-database.org/index.php?lang=en#d_7136

<https://www.plataforma-pep.org/ejemplos-ph/can-mati/>

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/>

Consulting & Passivhaus design; blower door essay

Function : Designer

Daniel Tigges - Tigges Architekt

<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/>

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
- Pavtherm 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

U_w = 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 : 2 022

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 PUAZ-SW120VHA con Fancoil Mitsubishi i-LIFE2 HP 1002 y 1202

Zehnder ComfoAir 450 ERV

4.44 kWp fotovoltaic 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

<https://www.zehnder.es/>

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 $n_{50} = 0.5$ 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



GREEN SOLUTIONS AWARDS
POWERED BY CONSTRUCTION21

