



Low energy buildings - Case Study: Loft in Cassà de la Selva (Girona)

	Category / year	New construction: nearly zero energy building or better - Small residential (1-2 family houses) / 2012
	Address	Cassà de la Selva - Girona (Spain)
	Contact details	<p>Constructor: Lluís Maymí</p> <p>Thermal installation engineer: Xavier Vilà i Pujolràs</p> <p>Interior architect: Manuel Sureda I Vila</p> <p>For further questions: Poliuretanos, Xavier Grabuleda xgrabuleda@poliuretanos.com</p> <p>Poliuretanos, Xavier Vila xvila@poliuretanos.com</p>
	Pictures	



Description of the building

Detailed description:

Detached house designed as an industrial-style loft following the most ambitious criteria of sustainable construction. The highest energy rating A was possible thanks to the use of an innovative thermal energy production system by aerogeneration (air-to-water) heat pump combined with floor heating and highly efficient PIR thermal insulation.

Building total surface: 126,45 m².

Building envelope:

PIR insulation boards covered on both sides with a multi-layered kraft-aluminium complex (thermal conductivity = lambda 0.023 W/m·K) in a continuous envelope without thermal bridges or condensation.

- *Floor:* Poliuretanos PIR SL boards of 60 mm with a thermal resistance of 2.60 W/(m²·K).
- *Facade:* Poliuretanos PIR 7C boards of 100 mm with a thermal resistance of 4.35 W/(m²·K).
- *Roof:* Poliuretanos PIR CM boards of 120 mm with a thermal resistance of 5.20 W/(m²·K).
- *Windows:* aluminium with split of thermal bridge (U-value: 2.7 -2.8 W/(m²·K)).

Energy efficient technologies:

- *Heating system:* aerothermal (air-to-water) heat pump that extracts heat from the outside air, generating at least 3 kW of free heating energy for every kW of electricity consumed and without direct emissions of CO₂.
- *Floor heating:* the heat is distributed throughout the loft via a low-temperature floor heating system.

Renewables:

- Aerothermal (air-to-water) heat pump



Energy consumption

Energy values:

- *Final energy demand:* 37.4 kWh/(m²·a)
- *Primary energy demand:* 51.3 kWh/(m²·a)
- *CO₂ emissions:* 12.7 kg/(m²·a)

Use of renewables:

- Aerothermal (air-to-water) heat pump

