

Arbóç

A 120 m² Passivhaus Classic certified home in Arbóç, built as two volumes linked by a central courtyard that gives the whole house its shape.

A Passivhaus built around a central courtyard

Arbóç is a 120 m² single-family home certified to the Passivhaus Classic standard. The narrow, deep plot called for a clear architectural response: two separate volumes joined together to frame a central courtyard, with the whole house arranged around it.

The project shows that the Passivhaus standard doesn't depend on size or budget. It comes down to the quality of the design and the care taken in building it.

Technical data

- **Location:** Arbóç, Baix Penedès
- **Year:** 2018
- **Built area:** 120 m²
- **Floors:** 2 floors
- **Type:** detached single-family, new build
- **Certification:** Passivhaus Classic
- **Architecture:** Energiehaus
- **Construction system:** light timber frame
- **Façade:** SATE and ventilated timber façade
- **Insulation:** blown cellulose
- **Climate control:** fan coils
- **Ventilation:** mechanical with heat recovery

Energy performance

- **Blower Door test:** 0.40 h⁻¹

- Heating demand: 13 kWh/m²|yr
- Heating load: 18 W/m²
- Cooling demand: 16 kWh/m²|yr
- Cooling load: 11 W/m²
- Primary energy: 89 kWh/m²|yr

At 0.40 h⁻¹, the airtightness we achieved comfortably beats the Passivhaus limit and reflects how precisely the envelope was built.

Architectural concept

The plot was narrow and deep, with an orientation that made it hard to spread solar gains evenly. Splitting the home into two volumes around a central courtyard increases the surface facing south, brings in more daylight, encourages cross ventilation and creates a sheltered outdoor space.

The whole building faces the courtyard, while the north façade stays almost closed to cut heat loss in winter. In summer, the north porch provides shade.

Interior layout

The ground floor holds the living-dining room, the kitchen, a bathroom, a flexible room and the plant room, all opening onto the courtyard. The upper floor brings the sleeping quarters together, with three bedrooms, two bathrooms and the laundry.

Keeping day and night uses apart makes the home work better on a practical level and improves how it performs in energy terms.

Construction system

Arbóç pairs a light timber frame structure with high-density blown cellulose insulation. The façade combines a SATE external insulation system with a ventilated timber-clad finish.

Together, the two systems strike a good balance between thermal protection, moisture management, durability and hygrothermal behaviour, with a lower carbon footprint than conventional solutions.

Systems and comfort

Heating and cooling run on fan coils fed by a high-efficiency system, while the dual-flow ventilation with heat recovery constantly refreshes the air, keeps energy loss to a minimum and maintains excellent indoor air quality.

The result is a compact home that performs at its best, holds steady comfort year-round and uses very little energy.

The Passivhaus standard doesn't depend on size. It comes down to the quality of the design and the care taken in building it.