

Modular construction vs Passivhaus: how they differ

Modular and Passivhaus are routinely conflated. The first defines how the house is built; the second, what energy performance it guarantees. Technical comparison, decision matrix and when each route makes sense for buyers researching premium home construction in Catalonia.

Construction system vs energy standard, the key clarification

The confusion stems from a terminological overlap. Modular describes how the building is put together: if components are industrialised in a factory and assembled on site, we speak of modular or industrialised construction. Passivhaus (the German word for "passive house", an internationally recognised building standard) describes what performance the building delivers: it is an energy standard, not a construction method. It defines measurable thresholds for heating and cooling demand, airtightness and thermal comfort, but does not require any specific technique to reach them.

The practical consequence of this distinction is counter-intuitive and very relevant for the buyer. A house can be modular and Passivhaus at the same time. It can be modular and not Passivhaus-certified. It can be entirely site-built (non-modular) and meet Passivhaus comfortably. And, of course, it can be neither. All four combinations exist in today's market, and price, perceived quality and actual performance vary widely within each.

Understanding this separation prevents common purchase mistakes, such as assuming that paying the premium of an industrialised house automatically implies certified energy performance, or that giving up modularity closes the door to Passivhaus.

Modular construction, what it is

Modular construction shifts part or all of the build process from the site to an industrial plant. Modules (three-dimensional volumes) or panels (two-dimensional elements) are manufactured indoors, in a standardised quality-control environment, and transported to the plot for an assembly that can take from a few hours to a few weeks, depending on the level of industrialisation.

The main advantage is on-site speed. A volumetric house can be sealed and fitted with basic services in a single day of assembly, against the months required for the same enclosure stage in traditional construction. That factor matters for clients with tight relocation schedules or with plots where prolonged scaffolding and material storage create neighbourhood friction. A second advantage is quality control: cutting timber and assembling panels under a roof, with regulated humidity and a stable workforce, reduces defects in flatness, squareness and airtightness.

There are also structural constraints worth keeping in mind. Road transport caps module dimensions (typically up to four metres wide to avoid special transport), which conditions the architectural language. Plots with complex topography, restricted access for heavy cranes or dense heritage settings (historic centres, listed clusters) are difficult to resolve with pure volumetric modules. And custom design, with singular geometries or non-standard materials, does not always fit industrial catalogues. Industrialisation is a growing trend in the Catalan sector, but it is not the universal answer that trade-show booths sometimes suggest.

Passivhaus, what it is

Passivhaus is an energy standard developed in 1991 by engineer Wolfgang Feist at the Passivhaus Institut (PHI) in Darmstadt, Germany. It defines a set of quantified thresholds that a building must meet to be certified: annual heating and cooling demand below fifteen kWh per square metre, airtightness verified by Blower Door test below 0.6 air changes per hour at 50 pascals, and stable thermal comfort throughout the year. It rests on five principles: continuous insulation without thermal bridges, an airtight envelope, high-performance windows, mechanical ventilation with heat recovery, and orientation with solar control.

Certification is issued by accredited bodies, not by the builder itself. That detail is what separates Passivhaus from most commercial energy-efficiency claims on the market: performance is not self-declared, it is verified through calculation with the official PHPP software, physical measurement on the finished building, and documentary review by an independent certifier.

Passivhaus is, by design, agnostic to the construction system. It can be certified with timber-frame, concrete, masonry, steel or hybrid structures. It can be certified with modular construction, with site-built construction or with hybrid systems. The standard looks at the thermodynamic outcome, not at the process. That trait is what makes it especially useful for a buyer who wants performance guarantees without giving up architectural freedom.

Side-by-side comparison

Dimension	Modular	Passivhaus
What it defines	Construction process	Energy performance
Verifiable	Manufacturer self-declaration	Independent third-party certification
Typical premium vs conventional	5 to 15 per cent	10 to 25 per cent
On-site construction time	30 to 50 per cent faster	Variable depending on system

Dimension	Modular	Passivhaus
Energy savings	Variable, depends on actual quality	Reduction verified at certification, typically 60 to 90 per cent
Compatible with the other?	Yes, modular Passivhaus exists	Yes, non-modular Passivhaus exists

The table compresses the difference in nature between the two terms. Modular speeds up the build and, when well executed, improves material quality, but does not in itself guarantee thermal performance. Passivhaus guarantees performance with measurable numbers, but says nothing about execution speed or industrial process.

When modular makes sense

Modular construction shines for a very specific project profile. Tight schedules, often tied to the sale of a current home or to a fiscal-residence change. Repeating typologies where industrial rationalisation has room to operate: developments of several similar units, second homes with a standardised brief, modular extensions over existing dwellings. Plots with wide access, no significant slope, and reasonable proximity to a road that admits cranes. And a client who values calendar predictability over architectural singularity.

The limitations are the complementary set. Steep topography, narrow plots with rural access, dense heritage settings, or singular briefs with significant cantilevers and non-rectangular geometries tend to come out more expensive or to be unbuildable through pure volumetric modular construction. In those cases, a hybrid solution (industrialised panels assembled on site) or well-executed traditional construction usually wins on both cost and result.

When Passivhaus makes sense

Passivhaus is designed for a different profile, not necessarily mutually exclusive with modular. Explicit commitment to measurable energy savings and thermal comfort. A long-term home, not a short-horizon resale operation. Clients who value third-party performance verification over plain commercial declaration. And, often, environmental sensibility and the wish to align residential wealth with energy-autonomy and indoor-health goals.

A key point is that Passivhaus is compatible with custom architecture. It does not impose a typology, does not require modular dimensions, does not force you to give up a singular facade or an atypical brief. If the architectural function of the project is central for the client (a frequent case in premium housing in the Vallès, the Maresme or the Catalan coast), Passivhaus delivers the technical guarantee without restricting the language.

The PAPIK Group approach

We work with a proprietary system, Eskimohaus®, refined over thirty years of construction in Catalonia. Construction happens on site, with prefabricated industrialised elements (envelope panels, joinery, services components) that are assembled with the geometric flexibility of traditional building. The result combines two attributes often presented as incompatible: industrial quality control and design freedom.

All our projects are Passivhaus-certifiable by default. Methodology, envelope, joinery and ventilation arrive on site already sized to meet the standard. The client then decides whether to activate the formal PHI certification or to settle for equivalent performance without the certified document, depending on their wealth-management and tax criteria. That decision no longer conditions the construction process, because the process itself is set up to clear the thresholds.

The benefit for the client is direct: certifiable energy performance with fully bespoke architecture, without the geometric restrictions of volumetric modular and without giving up the industrial predictability of components.

Common myths to dispel

"Modular is always cheaper." Not true. The premium of industrialisation does exist and is offset, depending on the case, by time savings or by better quality control, but not by a final price below well-executed traditional construction. Comparing budgets requires equalising performance, not just euros per square metre.

"Passivhaus only makes sense in cold climates." False, with nuance. The standard was born in a continental cold climate, but the methodology adapts to the Mediterranean climate through a priority inversion we call cooling-first. We describe it in detail in the article on [Mediterranean Passivhaus](#).

"Modular always looks like a shipping container." False. The aesthetic diversity of today's industrialised offer is wide, ranging from catalogues with a domestic image to panel systems that allow facades indistinguishable from traditional construction. The container perception is associated with a specific aesthetic, not with modularity as such.

"Passivhaus only works for new construction." There is an EnerPHit certification for retrofits, with thresholds adapted to the constructive reality of the existing stock. A deep retrofit of a 1970s or 1980s home can reach performance very close to a new-build Passivhaus.

"All modular manufacturers are equivalent." False and potentially costly. Material quality, envelope detailing, environmental certifications of components and final thermal performance vary substantially between suppliers. A module is not, by itself, a guarantee of anything.

Quick decision framework

Five questions that help orient the decision before requesting comparative budgets:

- 01 Is the calendar a critical constraint, with a fixed move-in or delivery date? If so, modular gains weight.
- 02 Does the plot have complex topography, restricted access or a dense heritage setting? If yes, site-based construction (with or without industrialised components) is usually better suited.
- 03 Is certified energy performance an explicit priority, not just a sales argument? If it is, Passivhaus is the route, regardless of the construction system chosen.
- 04 Does the architectural design need to respond to a singular brief, with non-rectangular geometries or non-standard materials? If yes, pure volumetric modular is ruled out; site-based construction or

hybrid systems fit better.

- 05 Are you looking for a home for decades or an operation with a short horizon? In the first case, investment in a Passivhaus envelope pays back through the energy bill and through comfort. In the second, the calculation changes.

None of the questions has a single answer. The point is to order priorities before comparing budgets, because a numerical comparison between different systems without that prior step tends to be misleading.

Modular and Passivhaus are not alternatives to each other: they are answers to different questions. The first answers how the house is built, the second what performance it delivers. Choosing well requires understanding what exactly you are buying and what is left out of the declared package.

If you want to test your case against concrete data (brief, indicative budget, certifiable performance), the configurator offers a short project assessment with no commitment.

[Configure the budget for my project](#)

Read also:

[PAPIK Group construction service](#)

[Five key Passivhaus technologies for 2026](#)

[The wood revolution in construction](#)

[Budget for a passive house](#)