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Forty degrees outside, twenty-five inside

The Passivhaus standard as an answer to the summer we already have.

The summer of 2026 has once again exceeded every forecast. Spain has already strung together four heatwaves, and the first half of the season was, according to the State Meteorological Agency, the warmest since modern records began, with average temperatures 3.3 degrees above normal. During the episode in early July, 38 provinces passed 40 degrees and Barcelona broke maximum-temperature records that had stood intact for more than a century. What was an exceptional phenomenon a decade ago has become the new normal of the calendar.

Faced with this reality, it is worth pausing on an uncomfortable idea: housing has stopped being, by default, a refuge. A large share of heat-related mortality does not happen in the street or at work but inside homes, and it affects older people above all. A poorly insulated home behaves like a storage heater: it absorbs heat during the day, holds it through the night and never lets the body recover. Add to that the heat island effect of our cities, which raises local temperatures several degrees above the surrounding countryside, and an electricity bill that soars in July and August for those with air conditioning, and leaves those without it unprotected.

The relevant question is no longer how to cool harder, but how to build homes that barely need cooling at all. This is where the Passivhaus standard, which we have been applying at PAPIK Group for years, shows its true value.

A standard many associate only with winter

There is a common misconception. When people talk about passive houses, most think of heating savings and comfort during the cold months. That is true, but it is only half the story. The same principles that stop heat from escaping in January are the ones that stop it from getting in in August. A passive envelope works in both directions, and that is precisely why it performs so remarkably during heatwaves.

This behaviour is no accident. It is the result of a design that works with the physics of the building rather than against it.

Why a passive house stays cool

The first factor is continuous, high-thickness insulation across facades, roof and floor. It acts as a thermal barrier that drastically slows the entry of outdoor heat. While the thermometer rises and falls fifteen or twenty degrees over the course of the day, the interior remains stable.

The second is airtightness. A passive house is built with very demanding infiltration control, verified with the Blower Door test and with a reference value of **n50 equal to or below 0.6 air changes per hour**. In a conventional home, hot outdoor air seeps in uncontrolled through joints, roller-blind boxes and poorly resolved junctions. In a passive house, that uncontrolled flow simply does not exist.

The third, and decisive in summer, is solar protection. Passive design studies orientation and shading before placing a single window. Overhangs, louvres and external shading block the high summer sun, when it burns, and let through the low winter sun, when it warms. High-performance frames, with triple glazing and solar-control coatings, complete the system by regulating how much radiation is admitted on each facade.

Added to this are the absence of thermal bridges, those weak points through which heat finds a shortcut to the interior, and the thermal inertia of the construction, which cushions the peaks and prevents sudden overheating.

The fourth element is mechanical ventilation with heat recovery. In summer it incorporates a summer bypass that switches off recovery when it is not wanted, and makes it possible to use the cool night air to refresh the home without spending energy, what is known as night cooling. The result is air that is filtered and renewed constantly, something especially valuable during heat episodes with poor air quality, without having to open windows at midday.

The combination of all these factors explains a figure that surprises anyone who experiences it for the first time: with forty degrees outside, a well-built passive house stays at around twenty-five inside, stably and with minimal or zero cooling consumption.

Passive habitability: resilience that does not depend on the socket

Heatwaves do not arrive alone. They bring with them extreme electricity demand that strains the grid and multiplies the risk of blackouts just when cooling is needed most. In that scenario, the difference between an ordinary home and a passive house becomes critical.

This is what is known as passive habitability. A conventional building, if it loses supply, becomes uninhabitable within a few hours. A passive house, thanks to its insulation, its airtightness and its inertia, keeps safe indoor conditions for far longer, even without electricity. It stops being a problem and becomes a safe place. For the most vulnerable people, the elderly, children or the chronically ill, that thermal autonomy is not a convenience: it is a matter of public health.

Comfort, health and economy in the same equation

The advantage of a passive house in extreme heat is measured on three planes that rarely coincide. In comfort, because it guarantees a stable, pleasant temperature without noise or draughts. In health, because it protects those who suffer most from heat stress and ensures clean air at all times. And in economy, because it cuts the cooling bill to a fraction of the usual amount, precisely in the months when everyone else watches theirs double.

Building this way stops being a high-end option and becomes a logical response to the climate we already have. It is not about enduring the summer with air conditioning at full blast, but about designing buildings prepared for a context in which heatwaves will be more frequent, longer and more intense.

At PAPIK Group we have been building to the Passivhaus standard for years because we are convinced that comfort and efficiency should not depend on how lucky the electricity grid gets on a day in August. A passive house does not fight the heat. It simply does not let it in.