Find out more about...

Passivhaus

What is Passivhaus?

Passivhaus (sometimes called Passive House) is a design philosophy and energy assessment tool which originated in Germany, requiring super-insulated fabric and very low air tightness.

Heat loss through roofs and external walls accounts for >70% of heat losses in existing buildings (Passivhaus Institut). The fabric first approach looks at the building envelope to reduce energy.

To achieve certification, there are strict criteria to be met, before renewables are added to reduce the energy even further:

- Specific Heat Demand ≤15kWh/m^2/yr
- Specific Cooling Demand ≤15kWh/m^2/yr
- Specific Primary Energy Demand ≤120kWh/m^2/yr
- Air tightness ≤0.6ach@50pascals (n50)

The Primary Energy Demand includes space heating, domestic hot water, lighting, fans, pumps and all expected appliances.
Minimum U values are required, which means each element will have minimal heat transmission through the fabric:

- Walls and roofs: 0.15W/m^{2}K
- Windows and doors: 0.8W/m^2

Method has certified Passivhaus designers and consultants and we would be happy to help you with your project. Contact us for information.

Thermal bridging Heat can escape through poor detailing, and so thermal bridging must be more or less eliminated (a psi value of <0.01W/m^{2}K). See our information sheet on Thermal Bridging.

Thermal comfort To be certified, the Passivhaus must maintain temperatures above 16°C during winter, even without heating on.

Mechanical Ventilation Due to the very low air tightness, whole house mechanical ventilation with heat recovery is required (MVHR), and must be 75% efficient as minimum with low specific fan power.

Early considerations

Orientation To maximise solar gain in winter Compact building form: for a low surface area to volume ratio

Insulation The type and performance of insulation will affect the thickness of walls, investing in good quality insulation could reduce the thickness needed

Buffer zones Draught lobbies can reduce heat loss. Appointing a champion to monitor on site will increase chance of successful certification

Is Passivhaus a sustainability assessment?

Passivhaus concentrates on reducing the energy consumption of buildings, and so only addresses that aspect of sustainability. In practice, those of us who understand Passivhaus and sustainable construction are likely to be environmentally conscious, but if a full sustainability assessment is desired then the Home Quality Mark or BREEAM would be the most appropriate assessment tool. Passivhaus would complement a sustainability assessment.