



Do you know your Passiv from your EnerPHit?

New-build **Passivhaus** homes are warm in the winter; cool in the summer, with savings for the environment and your cash.



No matter what your views on global warming may be, it makes sense to build the most energy-efficient home you can. Your wallet will thank you and the planet probably will be quite happy about it as well.

Passivhaus is the leading international low-energy design standard with more than 65,000 buildings worldwide designed, built and tested to its standard. It is a highly effective way of reducing energy use and carbon emissions from buildings.

The Passivhaus Trust is an independent, non-profit organisation which provides leadership in the UK for the adoption of the Passivhaus standard and methodology, promoting the building principles developed by the Passivhaus Institute in Germany.

The Passivhaus system has a strict quality assurance process that can be certified through an exacting quality assurance process; certification adds value to a property.

EnerPHit is the Passivhaus specifications for the retrofitting or renovation of an existing property; the savings are not as good but still amongst the highest achievable.

The Passivhaus standard

'A Passivhaus is a building in which thermal comfort can be achieved solely by post-heating or post-cooling the fresh air flow required for a good indoor air quality, without the need for additional recirculation of air.' - Passivhaus Institut (PHI)

Passivhaus uses a heat recovery ventilation system, using very little energy for heating and cooling, and giving a high level of comfort, including humidity levels. Draft free and super-insulated, Passivhaus today can call on innovative products unheard of when the standard was born out of work in 1988 by

Bo Adamson of Lund University, Sweden, and Wolfgang Feist of the Institute for Housing and the Environment, Darmstadt, Germany.

Add to that computer systems to run lighting and heating within the home which are far in advance of anything Adamson or Feist could have imaged when starting out.

Ecology and energy bills aside, one of the most attractive features of Passivhaus design is the amount of natural light thanks to 'active daylighting', the strategic placing of windows and reflective surfaces so that direct and indirect sunlight can flood the property, along with 'daylight harvesting' - the strategic placing of lighting and automatic or computer-driven dimming and switching off.

The UK trust says: 'Passivhaus buildings achieve a 75 per cent reduction in space heating requirements, compared to standard practice for UK new build. The Passivhaus standard therefore gives a robust method to help the industry achieve the 80 per cent carbon reductions that are set as a legislative target for the UK Government.'

An eco-first for Scotland

EnerPHit: 'A sophisticated and reliable way of building in an ecological, sustainable and eco-friendly method.'

August 2018 saw a first for Scotland when a once draughty, traditional barn was certified as one of the country's most energy-efficient homes.

Thomas Robinson Architects had the very first EnerPHit certified building in Scotland signed off.

EnerPHit is for existing properties what the Passivhaus standard of energy-efficient building is for newbuilds.

construction, showing every stage.

'This degree of rigour is not something that the construction industry in Scotland is used to. It requires the contractor to fully embrace it and everyone on site to understand what is at stake,' said Tom.



EnerPHit is used for retrofit or renovated houses, where the presence of older materials, a crumbling barn wall, for example, means that different methods are used to create extreme energy efficiency. There are approximately 1,000 certified Passivhaus buildings in the UK. Of these around 56 are EnerPHit projects, but this is Scotland's first.

Thomas Robinson and his team have created an exceptionally eco-friendly home from what was an old barn.

EnerPHit adheres to the Passivhaus aim to reduce carbon emissions, improve energy efficiency and ultimately achieve greater energy security, while creating an exceptionally pleasant environment. This is done via a variety of methods.

Tom said: 'Achieving compliance for this building was not straight forward and many of the obvious measures that could have been done such as making the south facing openings larger were not available to us. However, we've done it and we and the client are exceptionally pleased with the result.'

'We overcame challenges including getting planning consent for a large glazed opening to optimize a magnificent view where in theory no glazing could be allowed. Achieving the EnerPHit standard in the Passivhaus method in the computer energy model involved careful balancing of glazed areas, high quality components and construction detailing to eliminate cold bridges.'

Mike Roe of Warm Low Energy Building Practice certified the project designed by architect Tom Robinson, and built-in central Scotland, issuing a unique ID number along with a plaque.

To get a Passivhaus building certified requires that an independent Passivhaus Certifier like Mike to check the Passivhaus Planning Package software calculations carried out by the designer. Also, delivery note evidence must be submitted for all relevant products used such as windows, doors, insulation, air tightness seals membranes and tapes.

Documentation of air tightness tests and mechanical ventilation and heat recovery systems used must be submitted for checking, together with photographic evidence of the

“ We have used Passivhaus methodology and created a home with benefits to health and comfort plus the advantage of low energy costs - **architect** ”



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