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## **Passivhaus in the UK – Presentation Synopsis**

Passivhaus is the name of a performance based set of design criteria for very low energy buildings, developed in Darmstadt, Germany at the beginning of the 1990s by Professor Wolfgang Feist together with Professor Bo Adamson from Lund University in Sweden.

Despite the fact that to date over 15,000 Passivhaus buildings have been constructed worldwide and the standard is rapidly being adopted in different regions and cities throughout Europe, the UK only saw the first completed accredited Passivhaus building earlier this Spring (2009).

Passivhaus designs seek to eliminate the need for space heating and cooling through the use of passive solar design principles (PSD), super-insulation, extremely air-tight fabric, no thermal bridges and the use of MVHR (Mechanical Ventilation with Heat Recovery). They rely on the use of good architectural detailing to perform. Buildings constructed to Passivhaus standard are typically shown to have a reduction in the need for space heating of 80% or more.

In order to meet Passivhaus design standards a building must perform to energy use criteria for heating and cooling of no more than 15kWh/m<sup>2</sup>a and have an overall primary energy consumption (inclusive of energy use for electrical appliances and lighting) of no more than 120kWh/m<sup>2</sup>a. The building envelope should also have 'U' values of 0.15W/m<sup>2</sup> K or less and the air-change rate should be less than 0.6 of the house volume per hour since the efficiency of the MRVH relies on a very air-tight fabric.

The first Passivhaus designs constructed were residential, however the specification is applicable to many other building types and also to refurbishment projects. The Passivhaus projects that have been constructed around the world include for schools, offices, apartment blocks, supermarkets and gyms. Most of these are in Europe, but examples exist in the US, Korea and in various other locations and different climatic zones. There are also plans for Passivhaus developments in China.