

Object name

**Y Foel****United Kingdom**

Object photo



Object description

The house, called 'Y Foel' (Bare Hill) is a residential 2/3 bedroom private house. A hybrid construction was used - an external I-beam timber frame with an internal core of earth block walls (ground floor only), in combination with Welsh slate floor slabs on 60% GGBS (ground granulated blastfurnace slag) in-situ slab. This has produced very stable indoor temperatures.

Negative psi values, modeled in Therm 5.2, assisted in achieving the 15kWh/m<sup>2</sup>/pa target. Every junction was treated with this level of attention, as were significant service ducts. Ecological Building Systems supported JPW, to trial pro clima air tightness and membrane systems. Incorporating the membrane within a pre-manufactured off site frame in the future would be favoured to reduce labour costs but its flexibility on site for unforeseen circumstances proved invaluable. The final result was  $n_{50} = 0.247 -1 @ 50Pa$  (PassivHaus Institute requirement is 0.6)  $050 = 0.250m^3/(h.m^2) @ 50Pa$  (UK measurement).

On this project a Drexel & Weiss Aerosilent Classic with an RGB- H controller and solenoid activation of 1k W e electric towel radiator and 1200W PTC post air heater was specified to create a simple low Maintenance system which could be eventually powered by renewable electricity generation in phase 2 once an energy profile had been established. The natural ventilation strategy simulated in PHPP in combination with a central mass core has so far been sufficient to maintain summer comfort levels.

Fact sheet

Residential development in Wales

Treated Floor Area	99.52 m <sup>2</sup> each
Number of homes	1
Completion date	2009

**Energy standard [PHPP]**

Heat requirement / year	15 kWh/m <sup>2</sup> a
Heat load	12.1 W/m <sup>2</sup> K
Primary energy requ.	<120 kWh/m <sup>2</sup> a
Air-tightness ( $n_{50}$ -value)	0.25 1/h
Building type	Timber & masonry hybrid

**U-value**

Exterior wall	0.10 W/m <sup>2</sup> K
Roof	0.087 W/m <sup>2</sup> K
Basement floor / Floor slab	0.118 W/m <sup>2</sup> K
Windows / average	0.9 W/m <sup>2</sup> K

**Specification ventilation system**

Drexel &amp; Weiss Aerosilent Classic

**Heating installation**

Ventilation as above, 4m<sup>2</sup> flat plate SHW collector, 200lt HWC 600w towel rad & 1200w post air heater

Construction costs TBC Euro/m<sup>2</sup>**Building owner**

Private client

**Architect/Planner**

John Williamson, JPW

**Contractor**

JPW

**Photo credits**

John Williamson