

Denby Dale Passivhaus Green Building Store



DENBY DALE PASSIVHAUS – EXTERIOR

The **Denby Dale Passivhaus** was designed and built by an inter-disciplinary team, led by Green Building Store's Bill Butcher, as a cost-effective and ultra energy-efficient home for a retired couple. The clients' desire for a conservatory was incorporated into the building envelope as an integral solar space on the south elevation, with exterior blinds to minimise overheating. The project is the first certified Passivhaus in the UK to be built using cavity wall construction. To achieve Passivhaus performance in cavity wall construction, the team developed a number of original design details. These details have been freely disseminated to the wider construction industry through technical briefings, blogs and films. The project's pioneering approach has subsequently been adopted by a number of large scale projects and has demonstrated that cavity wall construction is a serious and cost effective option for Passivhaus projects.



DENBY DALE PASSIVHAUS – INTERIOR



DENBY DALE PASSIVHAUS – EXTERIOR



SOLAR SPACE, DENBY DALE PASSIVHAUS – INTERIOR



DENBY DALE PASSIVHAUS – INTERIOR

Project Overview

Name: Denby Dale Passivhaus
Location: Denby Dale, West Yorkshire
Building Type: Single family house
Construction type: Cavity wall masonry construction
Completed in: April 2010
Occupancy status: Occupied since May 2010
Construction Cost: £1194/sqm basic build costs

Sustainability features

Primary Energy Demand: 87 kWh/(m²a)
Heating and Cooling Demand: 11 kWh/(m²a)
Ventilation strategy: PAUL Thermos unit
Heating strategy: MVHR Duct heater; Vaillant EcoTec 612 gas boiler; Radiator in living room and two towel rails.
Shading strategy: Roof overhang; External blinds for solar space
U values:

- Exterior wall: 0.113W/m²K
- Roof: 0.096 W/m²K
- Ground floor: 0.104 W/m²K
- Windows/average: 0.8 W/m²K

Measured Performance

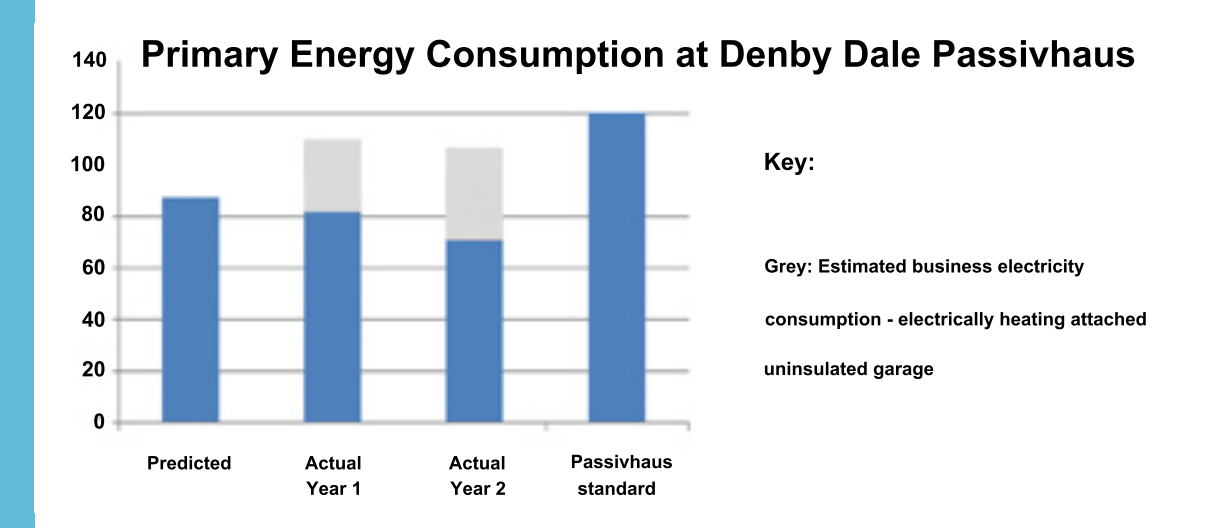
Gas consumption (including space heating, hot water & cooking):

- May 2010 – May 2011 = 47.6 kWh/(m²a) TFA
- May 2011 – May 2012 = 32.59 kWh/(m²a) TFA

 Electricity consumption:

- May 2010 – May 2011 = 22.13 kWh/(m²a) TFA
- April 2011 – April 2012 = 27.02 kWh/(m²a) TFA

 Primary energy consumption:
 Year 1: 109.91 kWh/(m²a) TFA
 Year 2: 106.099 kWh/(m²a) TFA



Reasons for discrepancy:

High electricity consumption associated with heating uninsulated attached garage for clients' small business. Estimated at 50% of all electricity consumption. Over-capacity boiler with poor controls leading to inefficiency. Improved control system added January 2012
Latent heat – house drying out in the first year

Air pressure result: 0.33 ach @ 50Pa (to Passivhaus and Euronorm standard)

Occupant Feedback:

"You can sum Passivhaus up in three words: comfort, sustainable and cost-effective. We wouldn't want to ever live in a non-Passivhaus now. The whole thing has been a victory for common sense."
- Geoff & Kate Tunstall, owners Denby Dale Passivhaus.

TEAM CREDITS

Client: Geoff & Kate Tunstall
Consultant: Pete Warm, WARM
Certifier: Pete Warm, WARM
Project lead: Green Building Store
Architect: Derrie O'Sullivan

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