

Vacuum Insulation Panels in Construction

External Wall Insulation

Scheme:	Retrofit for the future
Architect:	Energy Conscious Design
Completed:	May 2011
Location:	Crawley, West Sussex



Fig. 1

Kevothermal Limited's Vacuum Insulation Panels have been utilised in this 'Retrofit for the Future' project at 33 Warnham Road, Crawley.

The aim of this scheme was to meet the UK governments target for reducing greenhouse gas emissions by 80% by 2050, while also cutting energy use dramatically.

ECD Architects developed a whole house retrofit solution which would both drastically reduce CO2 emissions whilst also significantly improving energy performance.

The existing tenants at Warnham Road faced annual energy use consumption levels of 2,968kWh/yr of electric and 27,631kWh/yr of gas. The forecast for the completed refurbishment shows major reductions to 1,883kWh/yr of electric and 5,900kWh/yr of gas. A total of 74.5% reduction in energy and a reduction of 4.6 tons of CO2

One of the major issues for ECD Architects was how to approach the thermal upgrade of the external fabric of the property. The existing external walls were system built concrete panels with timber frame infill. Utilising traditional forms of insulation would have meant cladding the property with up to 150mm of PUR insulation.

The approach taken by ECD Architects was for the existing walls to be externally clad with a combination of 25mm thick **Kevothermal Vacuum Insulated Panels (VIP's)** and rigid phenolic board. This system provides a **U-value of 0.15w/m2K** within only a 65mm depth. The existing windows were replaced with high performance Passivhaus standard windows with a whole window U-value of 0.75w/m2K.



Fig. 2

The process of installing this VIP based external wall insulation system began with a matrix of 25mm thick phenolic battens being mechanically fixed back to the external face of the existing façade (Fig. 2). This matrix of phenolic battens was necessary to both hold the VIP's in place and to also provide fixing points for the secondary layer of 40mm phenolic board.

Kevothermal produced factory premade panel sizes of 900mm x 500mm (Vacuum Insulation Panels cannot be cut on site) which were then placed between the battens. (Fig.2)



Fig. 3

The next stage was for the VIP's to be overlaid with a layer of 40mm phenolic board. (Fig. 3 & 4) The phenolic board was fixed back through the underlying grid of battens ensuring that no fixings were sent through the VIP's (Puncturing VIP's will dramatically reduce their performance)

The final part of the external insulation system was for a mesh and render coat to be applied. The completed system is shown in Fig. 1. Wetherby Building Systems who were new to VIP installation found this method simple and easy to install. The building will be monitored over a one year cycle to measure the performance in energy reduction.



Fig. 4

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