

Vacuum Insulation Panels in Construction

External Wall Insulation

Scheme: Retrofit for the future
Architect: Energy Conscious Design
Completed: July 2011
Location: Enfield, London



Fig. 1

Kevothermal Limited's Vacuum Insulation Panels have been utilised in this 'Retrofit for the Future' project at 13 Joyce Avenue, London.

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 utilised their retrofit experience to comprehensively address thermal bridging concerns and fabric air tightness whilst simultaneously employing advanced insulation materials to address heat loss.

The goal of this project was to reduce both the primary energy requirement and CO₂ emissions. The property's annual CO₂ emissions were 160 (kgCO₂/m².yr), and this is forecasted to reduce to 29 (kgCO₂/m².yr). The primary energy requirement was 678 (kWh/m².yr) and this is forecasted to reduce to 142 (kWh/m².yr).

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 a combination of cavity wall, brick solid wall and tile clad solid wall. 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 mechanically fixed back to the outside of the existing façade. This matrix of phenolic battens was necessary to both hold the VIP's in place, and also to provide fixing points for the secondary layer timber battens which would support the tile battens and final render coat.

Kevothermal Limited produced factory premade panels of varying sizes to suit the phenolic batten layout which had been determined on site (Vacuum Insulation Panels cannot be cut on site)

The VIP's were then placed between the battens. (Fig.2)



Fig. 3

The next stage was for the timber battens to be mechanically fixed back through the underlying phenolic battens (reduced thermal bridge due to phenolic battens) and then the secondary phenolic insulation layer was fitted over the VIP's.(Fig. 3 & 4) The phenolic board was temporarily taped in place. This then allowed the tile cross battens to be fitted where necessary or the mesh layer for the final render coat.

The completed system is shown in Fig. 1. Bob Deane, MD of Wetherby Building Systems says "this is the second retrofit of VIPs for our company and we see much potential for the future in this area". The property will be monitored over a one year period in order to measure its performance in energy reduction.



Fig. 4

Contacts

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