



**WALLTITE®**

The airtight insulation solution

# Passivhaus, Poole, Dorset

Best Practice Case Study

 **BASF**

The Chemical Company

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## Best Practice Case Study



### Project data

**Project:** Passivhaus, Dorset

**Client:** Northcroft Construction Consultants

**Spray Foam Contractor:** Isotech Sprayfoam Ltd.

**Scope of Project:** Provide airtight thermal insulation to the complex roof structure

**Year Completed:** 2012

**Products Used:** WALLTITE CL 100 spray foam insulation

### Project description

The owner of this magnificent new five-bedroomed house near Poole in Dorset set out with the intention of building a home that would run with near-zero energy costs.

A building industry professional, he decided to use the German Passivhaus method of construction to achieve this end and, in the process, to become the owner of the first Passivhaus accredited house in Dorset.

### Challenges

The principle of Passivhaus design is to produce a super insulated and airtight structure that capitalises on passive solar gain and requires essentially no energy to heat the space. According to the Passivhaus standard, the building must have a total primary energy consumption (i.e. energy for heating, hot water and electricity) of no more than 120kWh/m<sup>2</sup> per year. Achieving this result requires exceptionally high levels of thermal insulation (U-values in the range of 0.10 to 0.15 W/m<sup>2</sup>K).

The Passivhaus standard also specifies a rigorous level of air tightness. The building fabric must not leak more air than 0.6 times the house volume per hour ( $n_{50} \leq 0.6/\text{hour}$ ) at 50 Pa (N/m<sup>2</sup>) as tested by a blower door.

This performance level will be achieved by the application of various materials and techniques throughout the house, but a particular challenge was posed by the roof space.

Wanting to utilise as much of the interior space as possible and to capitalise on the magnificent coastal views, the owner asked for the roof space to be used as a living area. It is therefore being designed to accommodate an office and a bedroom with en suite facilities.

The result is a complex roof structure that needed to be well insulated (the target U-value was 0.15W/m<sup>2</sup>K) and exceptionally airtight.

### Solution

The challenge with any irregular shape in a building design is to find an insulation material that can accommodate this irregularity without compromising the airtightness or consistent thermal insulation.

Having seen the WALLTITE product displayed at Ecobuild, the Project Manager *Jonathan Dronsfield* came to the conclusion that this would be the most effective way of achieving the desired result.

The roof structure was therefore designed with a combination of PIR board above and a 105mm layer of WALLTITE between the rafters. The WALLTITE spray-applied product was eminently suitable for this application.

Initially in liquid state, the product immediately forms an insulating foam on contact when it is permanently bonded to the substrate. This method of application means that the insulation moulds itself to the contours of the building and it can be used on any substrate material.

The entire 160m<sup>2</sup> area of the roof was treated with WALLTITE in just two days by BASF Approved Contractor *Isotech Sprayfoam Ltd.*

### Client quote

*Northcroft* construction consultants is acting as Project Manager, Employers Agent and Quantity Surveyor on the project. This was the organisation's first experience of specifying the WALLTITE product, but is unlikely to be their last.

"We were very impressed by the speed of the installation: WALLTITE was the best solution to combine thermal insulation with airtightness, particularly in hard to reach locations where traditional techniques would be unlikely to achieve the required standard," summarised Project Manager *Jonathan Dronsfield*.

