

Zero carbon home benefits from reflective membrane technology

A concept house for sustainable living developed by one of the UK's major housebuilders has been installed with reflective, insulating wall membranes from Glidevale Protect, helping to deliver an airtight and thermally efficient solution to retain heat within the structure.



Image courtesy of Barratt Developments PLC

Client:

Oregon Timber Frame Ltd

End client:

Barratt Developments PLC

Architects:

Technical and innovation team at Barratt Developments

Timber frame manufacturer and building contractor:

Oregon Timber Frame Ltd

Products:

Protect TF200 Thermo
Protect VC Foil Ultra

Zed House, built by Barratt Developments PLC, is a unique zero carbon home built on the University of Salford's main campus and is a collaboration between the housebuilder, industry partners and University of Salford academics.

The project has embraced the use of offsite construction, with closed timber frame panels manufactured in the factory at Oregon Timber Frame Ltd, part of Barratt Developments. This reduced build time by half, and with the home incorporating a number of cutting edge technologies and building materials, not only have carbon emissions been reduced but the design has been future proofed by substantially surpassing the Future Homes Standard.

Zed House is the first home built by a major housebuilder to achieve the net zero ambition and we are proud to have been chosen to be involved in this pioneering scheme.

The Zed House takes a fabric first approach, supported by a range of smart and renewable technologies, to ensure high standards of energy efficiency in this zero carbon home. Glidevale Protect is an

important partner on this project, providing high quality reflective membranes to enhance the wall's thermal performance which help reflect radiant heat and prevent energy loss from the timber frame home.

Oliver Novakovic,
group technical and innovation director at Barratt Developments PLC

The challenge

Zed House has been specifically created to provide a greater insight into zero carbon living and what this really means in terms of how homes are designed, built and lived in going forward. Academics at the University of Salford will be taking up residence in the house to experience this concept first-hand.

Over 40 organisations across the housebuilding, sustainability and technology sectors have been involved in the delivery of this flagship scheme and only those product manufacturers that could offer known energy efficiency benefits to help achieve net zero status were chosen.

Ensuring high levels of energy efficiency was a key requirement and, as the house will be continually monitored for energy performance, it was vital that all products specified would offer long term benefits. This aim to future proof the scheme by achieving

zero carbon emissions and low overall U-values has also led to Zed House becoming the first project by a major housebuilder to successfully exceed the requirements of the Future Home Standard which will be introduced in 2025.

With timber frame also playing a key role in the construction of the scheme, the products specified had to be compatible with offsite techniques, being easy to work with and install, both in a factory and site environment, to ensure the very best results.

Glidevale Protect's reflective wall membranes fit this brief perfectly and although they are concealed from view now the flagship home is completed, these 'hidden protectors' within the building envelope will play a role in reducing both energy consumption and carbon emissions.



Houses of the future are not going to be just consuming energy, they'll be generating energy, they'll be storing energy and they may well be trading energy.

So learnings from a project like Zed House can actually help inform what the direction of travel needs to be.

Professor Will Swan,
director of Energy House Laboratories at the University of Salford



The solution

By taking a fabric first approach as the initial foundation for the design and construction of the building envelope, the Zed House concept has been able to make a number of efficiencies to the way the building can retain heat and therefore reduce its carbon footprint. With many traditional homes losing heat through external walls, this particular issue was addressed through the use of our innovative reflective wall membrane technology.

Ideally suited for projects where energy efficiency is paramount, our Protect TF200 Thermo insulating external breather membrane and Protect VC Foil Ultra insulating vapour control layer and air barrier work hand in hand to create a highly effective system. Together, these innovative products deliver a low emissivity solution with the reflective surface of the membrane facing into still air cavities, thereby

contributing to a low U-value for the wall element. Our reflective wall membrane solutions provide market-leading aged thermal resistance, operating as a radiant barrier that reflects heat back into the property and ensuring long term performance over the life cycle of a building.

With Zed House being constructed offsite in order to make significant savings to both the carbon footprint and time frame of the build programme, we were delighted to supply our product solutions to specialist manufacturers and designers Oregon Timber Frame Ltd, in order to deliver this tailored solution. Our reflective membranes were factory installed to timber frame closed panels before being delivered and constructed onsite, saving time and cost, reducing the project's carbon emissions during construction.

Product overview

Zed House is an impressive example of how the most advanced energy saving technologies can be mixed with a fabric first approach in private housebuilding, and in doing so, future proofing design to address the challenges of climate change.

Our thermally efficient reflective wall membranes sit alongside a wide range of other housebuilding innovations used on Zed House, such as an air source heat pump, infrared heating panels on the ceiling, battery storage, photovoltaics and heated skirting boards. These features will be tested and monitored by University academics to help them continue research into how building product manufacturers can contribute to a lower carbon future for all.



Protect TF200 Thermo

- A waterproof, low emissivity, highly reflective breather membrane to improve the overall U-value of the wall.
- Helps meet the requirements of Building Regulations Part L, the Notional Dwelling Specification for walls and also NZEB in Ireland.
- Meets the permeability requirements recommended by TRADA and NHBC.
- Aligned with STA Advice Note 18, with an aged thermal resistance of $0.77 \text{ m}^2\text{K/W}$, incorporating printing and using typical 600mm stud centres.

Protect VC Foil Ultra

- A low emissivity, reflective air and vapour control layer to enhance the performance of the wall structure in conjunction with a still air cavity.
- Helps meet the requirements of Building Regulations Part L, the Notional Dwelling Specification for walls and also NZEB in Ireland.
- Thermal resistance R value $0.78 \text{ m}^2\text{K/W}$ (aged – incorporates printing) & $0.81 \text{ m}^2\text{K/W}$ (unaged – result used for low humidity environments).
- Excellent air and vapour resistance, reducing unwanted air leakage.
- 328 % improvement in thermal resistance on horizontal wall heat flow when used in unventilated airspaces, compared to membranes with no special treatment.
- Separate Protect sealing tapes also available.

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