



CASE STUDY



Structural Insulated Panels

In partnership with:



Wunderhaus

Client:

Wunderhaus

Architects:

Nico Rensch/Russell Clark

Main Contractor:

Wunderhaus

Superstructure Package:

SIP Wall & Roof Panels

www.thesipcompany.com



Structural Insulated Panels



Wunderhaus

Wunderhaus is a shining example of energy-positive technology at work. With exceptional performance and functionality, the award-winning Wunderhaus is the UK's first and only housing product capable of producing more energy than it consumes. Development began in 2018, and Wunderhaus has since featured in The Times and on ITV's This Morning.

Classical Design Meets Modern Methods

Wunderhaus is a house-building system that combines extensive research, innovative design, and state-of-the-art technology. The result is a highly efficient, fully-fitted, and cost-calculated prototype home. Manufactured offsite, Wunderhaus takes a product-based approach meaning clients can create a bespoke design to precise specifications.

Wunderhaus features open plan, double-height living areas with a 7.5m gable style roof to emphasise light and space. Based on the aesthetic style of classical architectural archetypes, Wunderhaus offers modern living inspired by traditional homes. Panoramic windows increase natural light and ambience while covered terraces and balconies allow for additional outside space. The system can incorporate Smart Technology to let occupants monitor and control the home's features via their Smartphone or tablet.

A Cutting Edge Sustainable Product

Thanks to sustainable technology and energy-efficient manufacturing, Wunderhaus is cited as one of the best-

performing products in the residential housing market. Meeting PassivHaus standards, Wunderhaus easily achieves government targets of 80% carbon reduction. Offering exceptional thermal performance and air quality, Wunderhaus uses an MVHR system to provide filtered air throughout. The building also features 12kW invisible PV solar panels, a 4kW air source heat pump for heating, cooling, and hot water, and triple-glazed windows with thermal insulation at 0.78 W/m²k.

Wunderhaus uses environmentally friendly materials, with the roof and external cladding being 100% recyclable. The home is so energy positive that - based on general use by an average 4-person family - Wunderhaus will incur zero net annual energy costs, feeding surplus energy from the building back into the grid.

The team behind Wunderhaus has worked with several partners across their supply chain to achieve a fully-tested, low-cost system that uses high-quality components. SIP panel systems ensure precise building specifications and on-time delivery.

Key to the design of the Wunderhaus system is the use of energy-efficient components and materials. The Wunderhaus team selected SIP wall panels, roof, and external envelope (excluding glazing) due to the adaptability and environmental performance. Structured Insulated Panels (SIP) minimise energy waste and noise penetrations while being more airtight than alternative building materials. This means the energy used to heat and cool rooms can reduce by up to 50%, making homes quieter and they require less fuel. SIPs also offer lower carbon emissions.

Nico Rensch, Wunderhaus founder, and Managing Director said of the project, "Wunderhaus is the opportunity to embrace a paradigm shift to energy positive, carbon negative, sustainable contemporary living."

SIPCO was able to assist with the design of a bespoke SIP wall system to fit with the particular requirements and energy goals of Wunderhaus. As Wunderhaus represents an exciting innovation in sustainable construction, SIPCO will ensure collaboration with the Wunderhaus team throughout the process, amplifying the synergistic approach of the whole system. Precision-engineered offsite in advanced manufacturing facilities, the SIP Panels offer exceptional thermal, acoustic, and fire performance. With their extensive experience in creating SIP systems, SIPCO can advise clients on the best design and bespoke layout for the wall panels to achieve the desired finish.

Wunderhaus offers a range of customisations and finishes to their package, with SIPCO able to provide a variety of external finishes to meet the desired aesthetic. Incorporating SIP roof panels into the Wunderhaus design improves weather-tightness and thermal efficiency in the roof. It also provides an opportunity to maximise headroom in roof and loft spaces, in keeping with the open and spacious design of the rest of the home.

Winners of the 2022 Red Dot Design Awards:





SIP Technology

Structural Insulated Panels (SIPs) are a highly sustainable, cost-efficient method of construction, using composite panel techniques to deliver excellent structural and energy performance characteristics in one system.

SIP panels are created by sandwiching a rigid Polyurethane (PUR) foam core between two parallel faces - usually Oriented Strand Board (OSB - to create a robust yet lightweight system. Offsite manufacturing allows for precise engineering with a fabric-first approach to reduce waste.

SIPs are easy to erect and free from the complications surrounding compression shrinkage and thermal bridging, often associated with other forms of construction. SIPCO Sips provide excellent thermal performance throughout the building lifespan while minimising wall thickness. The PUR core of rigid insulation and OSB3 facing panels achieve U-values as low as 0.10 W/m²K. SIP roof designs can also deliver thermal performance benefits with U-values between 0.21 to 0.10 W/m²K.

SIPCO SIP panels contribute positively to the environment by helping to lower CO₂ levels. Sequestered carbon is carbon that might otherwise be in the form of atmospheric CO₂ trapped within timber building materials. This means buildings made out of SIPs become an effective form of carbon storage. The carbon is locked up for the duration of the building lifespan.

By purchasing from SIPCO, you can be confident in a fully engineered structural insulated panel system (SIPS) that is fully BBA compliant for panel manufacture and fabrication and FSC®/ PEFC® certified.

For more information on this innovative concept:

Visit: www.wunderhaus.co.uk

For more information on our award winning services:

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www.thesipcompany.com