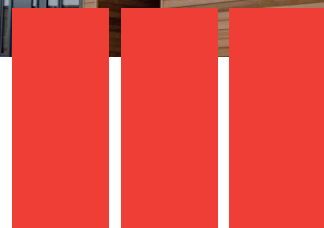




Structural Insulated Panels





# SIPCO SPECIALISE IN THE DESIGN AND FABRICATION OF STRUCTURAL INSULATED PANELS

SIPCO offer a complete SIP design, manufacture and installation service, or we can tailor our services to suit your specific requirements.

Our technical staff are always on hand to support from early stage through to on-site completion.

At SIPCO it's our ambition to continue **setting higher standards** within the SIP industry.

Our aim is to provide an expert personalised service dedicated to exceeding our clients expectations.

# WHAT ARE SIP'S?

SIPs is an acronym for Structural Insulated Panel System. Joining high performance rigid polyurethane foam insulation to oriented strand board (OSB) producing engineered building components. SIPs are becoming a preferred modern method of construction (MMC). The result is a building product that is predictable, resource efficient and cost effective. SIPs are used as walls and roofs on all types of buildings.



## > KEY ADVANTAGES

- Environmentally Friendly
- Excellent thermal performance
- Save construction time and cost
- Space-maximising design flexibility
- Light-weight structural strength
- Full design and technical support



## FREQUENTLY ASKED QUESTIONS

### Why are SIPs so much better?

SIPs out perform other building methods in virtually every category because the insulation is a component of a system, rather than an addition. SIPs are a structural composite like an 'I'-beam. The two faces act like the flanges and the rigid core is similar to the web. In short, the three components work together, rather than against one another.

This composite assembly yields stiffness, strength and consistent responses. Not only do test results show panels are stronger, but real life natural disasters have proven it time and again.

### Are SIPs new?

SIPs have been used and improved in the USA, Japan and Canada since the 1950's, and are now a 'traditional' method of building homes in these markets. SIPCO have been manufacturing SIPs for several years and adapting and improving the technology to meet the needs of the stringent UK market.

### Why are SIPs not more popular?

Simply a lack of awareness and the conservative nature of the UK building industry has held back the widespread use of SIPs. However, higher insulation standards driven by the Building Regulations and the importance of sustainable building methods has made people look to SIPs as the most economical method of meeting new requirements. U-values as low as 0.10 W/mK can be achieved in walls and roofs using SIPs which means the system easily meets the tighter values set in the 2006 revision of the building regulations.

### Why are SIPs environmentally friendly?

• SIPs buildings are more energy efficient, stronger, more quiet and draft free than older technology systems, like timber framing. Less air movement or leakage translates into less drafts, fewer penetrations for noise, lower energy bills and a significantly more comfortable and controllable indoor environment. The result is lower energy consumption and CO<sub>2</sub> emissions.

- Factory made with minimal site wastage and less landfill use
- OSB is made from sustainable harvested spruce, thinning and managed plantations.

- Up to 35% less raw timber use in SIPs buildings. All timber used is FSC graded.
- SIPs can help reduce the carbon footprint of the building due to superior air tightness that can be achieved along with wall and roof U values which out perform current building regulations.

### How much are they?

All things considered, SIPs generally cost about the same as conventional building materials but result in a building with better performance and utilisation of space. A building with SIPs for the roof allows the roof space to be fully used.

### How do SIPs save so much labour?

SIPs are manufactured efficiently and to high quality and accuracy in SIPCO's factory. They are transported direct to site in much larger dimensional sizes than other building materials. Erection is fast and easy using SIP Builds spline jointing system that rigidly locks the panels together. The building is weatherproof faster and other subcontractors can get a head start on the work that needs to be done.

### Who can design SIPs structures?

Professionals are increasingly aware of SIPs and there should be no problem designing a building from scratch to use SIPs or modifying an existing design. SIPCO will be happy to provide technical advice and support to professionals and self-builders.

### What is the best heating system for a SIPs house?

Any conventional heating system can be used but should be down-sized because SIPs houses are so energy efficient. Controls are important as heating demand can be low or negligible and overheating can occur.

### Is planning a problem with SIPs?

SIPs is an accepted building technology and will not cause problems with planning approval. In the same way a well detailed and engineered SIPs design will not raise difficulties with building control. SIPCO are always available to give advice.

### Are SIPs houses covered by warranty schemes?

All the companies offering warranty schemes accept SIPs construction. A well-designed and constructed SIPs house should have a life expectancy equal to present types of construction. Most lenders are able to offer mortgages on SIPs houses, assisted by BBA Accreditation, Zurich Approval and Premiere Building Guarantee.

### How do SIPs react to fire?

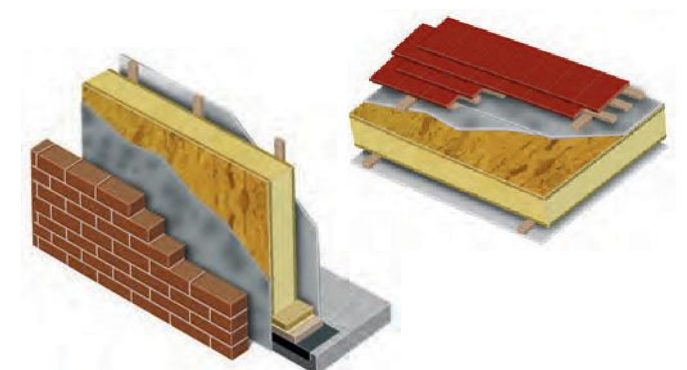
SIPs have passed every Standard fire test that is required. A key element of fire safety is protection of the SIPs and any other underlying structure with thermal barriers like gypsum wallboard.

### What foundation should be used?

Any construction can be used but the tolerance to level must be +/- 5mm to ensure the most efficient erection of the SIPs panels.

### What are the options for external finishes?

SIPs provide straight, flat surfaces. Choose almost any material from bricks, natural stone, brick stone, brick tiles, polymer and cement renders, timber cladding, and metal cladding. Roof finishes can include various lightweight systems as well as traditional slate or tiles.



## > SCHAEFER

Stunning contemporary home constructed in Cheshire which has since been short listed for several awards. SIPCO designed, manufactured this 3000 sq.ft single storey residence. The entire structure was built from 150mm SIPs for external and internal walls and roof panels.

## > MONTROSE

A development of 10 houses and 18 apartments featuring a mix of semi detached and detached houses both 2 and 3 bedroom.



## > DALTON II

The second tower of a 3 block development completed by SIPCO on behalf of Urban Splash.

The scheme utilised over 3000 sq.m of 125mm SIP to create an insulated backing panel to a high specification cladding system.

## > QHOTEL

This project features a 16 bedroom extension to the prestigious Telford Golf and Country club. External walls were constructed using 125mm SIPs, party walls were 2 x 100mm SIP panels.

The structure was designed and built to stringent building requirements for both air leakage and sound transmission.

The overall result was new hotel rooms ready for occupancy significantly quicker than if traditional methods would have been used.



## > MERECLOUGH

Architect Aiden Simpson designed this beautiful house to incorporate a 150mm SIP roof over 600 sq.m coverage.

SIPCO designed, manufactured and installed this roof scheme working closely with the Architect and engineer to develop this unique solution.

## > NEVILLE

This stunning 4000 sq.ft private residence was architecturally designed to incorporate a living roof solution along with a standing seam zinc roof cladding. SIPCO designed, manufactured and installed this project. The scheme utilised 150mm SIP external walls and roof along with 100mm SIP internal walls.



## > LEEDS

This project involved the complete regeneration of two 1960's tower blocks in Leeds city centre.

SIPCO designed, manufactured and installed the external wall construction of over 6000 sq.m to accommodate a carrier rail and GRP rainscreen system.

## > MILL HILL

82 Bed Residential Care Home in Lancashire.

Built using 125mm external walls and featuring Bison Beam concrete floors.



# SOCIAL HOUSING

With the demand for social housing and the stringent requirements for sustainable building solutions increasing, SIPCO has tailored its product offering to meet the needs of the RSL. Sip Build can ensure building code and compliance, without any compromise on quality and performance. To date SIPCO has completed a significant number of social housing units with several prestigious clients.



## > KEY BENEFITS

- Environmentally Friendly
- Excellent thermal performance
- Save construction time and cost
- Space-maximising design flexibility
- Light-weight structural strength
- Full design and technical support



# SUSTAINABILITY

We all have a responsibility to help protect the environment. At SIPCO we use our advanced technologies and intelligent thinking to develop our innovative methods of renewable construction. We use our professional expertise to help increase energy efficiency and reduce impact on the environment. Our aim and ambition is to achieve a result of 'net-Zero Carbon'.

The Code for Sustainable Homes is a measure of the environmental sustainability of new build homes in both the private and public sector.

The objective of the code is to become a single national standard for the design and construction of homes with the intention to use the code as a basis for future Building Regulations Part L (1A) changes for new homes to become net-Zero Carbon by 2016.

The code defines 6 levels of environmental sustainability with Level 1 being similar to 2006 Building Regulations and Level 6 being "net-Zero Carbon"

SIPCO have developed a range of products to satisfy each level of the Code for Sustainable Homes from 3 to 6. With the correct structural insulated panel thickness, the structural stability, insulation and air tightness is achieved by a single element negating the requirement for insulation and vapour barriers to be fitted on site at a later date.

Furthermore, we are also able to offer the Chain of Custody accreditation for both FSC and PEFC certified timber. Combining this accreditation and the inherent thermal, air tightness and acoustic advantages of structural insulated panels we can help drive up your sustainability scores and help you deliver a demonstrable sustainable home.

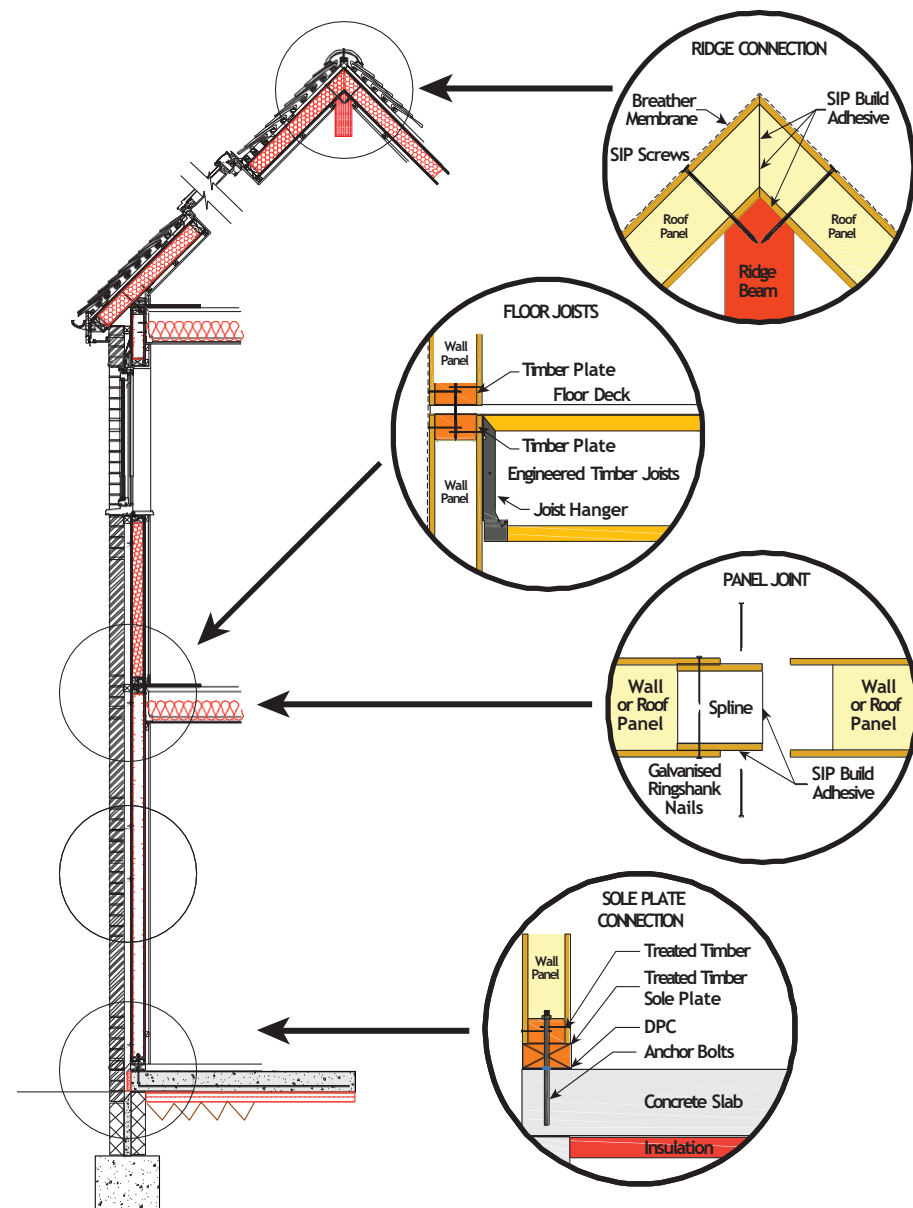


# TECHNICAL DETAILS / DATA

The SIPs panels consists of two facings of 11mm OSB (oriented strand board) bonded by pressure injection to CFC free/ODP zero polyurethane closed cell foam. The option of 15mm OSB is also available. The facings and core act as a composite structure.

## Typical Assembly Details

Comprehensive Details for Single Dwellings, Multi Unit Dwellings, Including separating walls and floors, and Commercial Buildings Available on Request.



## OSB

OSB/3 board comprises softwood flakes/strands bonded together with MUF (melamine urea-phenolic) resin, MDI (diisocyanate diphenylmethane) binder and waxes. The board is manufactured to the specification detailed in BS EN 300 : 1997 for OSB/3, loadbearing oriented strand boards for use in humid conditions.

All OSB/3 used by SIPCO is from sustainable timber sources.

## Dimensions

- Overall thickness 100mm, 125mm and 150mm
- Width up to 1200mm
- Wall heights up to 3000mm
- Roof panels up to 6500mm

Other widths and thicknesses are available on request.

## Thermal

The thermal conductivity of the SIPCO polyurethane core is typically 0.025 W/mK. Using the SIPCO SIPs panel can provide extremely low U-values for walls. Depending on detail of construction this can be in the range 0.21 to 0.10 W/m<sup>2</sup>K.

SIP roof designs can deliver U-values in the range 0.21 to 0.10 W/m<sup>2</sup>K. SIPCO are happy to give advice on specific designs.

## Fire performance

The SIPs panel will meet all the requirements in the Building Regulations with regard to fire resistance when lined with plasterboard. These requirements are similar to those for timber frame construction. A single layer will provide 30 minutes rating and a double layer 60 minutes rating.

SIPCO can provide standard construction details and results from independent fire tests.

## Acoustics

Acoustic insulation between rooms and external walls is improved by the plasterboard lining. SIPCO can advise on constructions to achieve levels of sound reduction required by the Building Regulations.

## Durability

A building constructed with SIPs panels will have durability comparable to other forms of construction. As long as the design follows best practice and the building is maintained and weathertight, a life of at least 60 years may be expected.

The durability of SIPCO system has been independently assessed and approved by the BBA. Contact SIPCO for a full copy of the BBA certificate.

## Air tightness and ventilation

Use of the SIPs panel and jointing system can create an airtight structure that will exceed requirements in the new future Building Regulations. Such is the effectiveness of the system that positive ventilation methods should be considered. At the same time positive ventilation systems can be linked to heat recovery that can save energy costs. SIPCO will be pleased to advise.

## Structural performance

- SIPs form a light and strong structure

- Excellent for in-plane loads

- SIPs buildings actually behave as thin shell structures, dispersing point loads throughout the entire surface area.

SIPCO has invested in an extensive structural testing program. These include loading the panels with a uniformly distributed load, axial loads centrally and eccentrically placed, racking loads, long-term creep, fixing pullout and shear and bending loads on the panel joints. All tests have been done by independent UKAS approved laboratories. For more information on the test results please contact SIPCO.

The strength of the joints between the individual panels is such that panels can be used to span over openings and be supported by the panels each side. It is easy to incorporate additional timber to support localised concentration of loading. Routinely this is done at the joints in the panels. However, with careful detailing, much of this can be avoided.

SIPCO will be happy to provide guidance to structural designers.

## Structural strength

The permissible design values to be used when evaluating the vertical resistance of 100mm thick panels up to 3.0m high are:

64 kN/m when axially loaded, 57 kN/m when eccentrically loaded by not more than one quarter of the thickness.

These figures are for medium term loads and are based on two sets of tests to failure of six panels using the methods of BS5268-2:2002 Section 8.

Data for other panel configurations is available on request from SIPCO. The designer must take into account the reduction in axial load capacity which may occur when the panel is also subject to transverse loading such as wind.

## Transverse loads\*

| Span condition | Load at span/333       |
|----------------|------------------------|
| 3m double span | 4.6 kN/m <sup>2</sup>  |
| 4m single span | 2.33 kN/m <sup>2</sup> |

Serviceability deflection should not exceed span/333 or 14mm. The structural engineer may accept larger deflections. Structural engineers must be satisfied on FOS. When assessing deflections, the design engineer must take into account simple bending, shear deflection and creep. Data for other spans and panels is available on request from SIPCO.

\* These loads are based on tests on panel 150mm thickness, 11mm OSB/3 faces, and 1.2m width.

## Advantages of SIPs

- Environmentally friendly - ODP zero insulation core
- OSB from sustainable forest resources - No on-site waste
- Excellent thermal performance - Insulation U-value, lack of thermal bridging and airtightness
- Save construction time and cost - Large engineered components - Delivered in Kit Form - Detailed Build Instructions
- Space-maximising design flexibility - Habitable roof space - 3-bed houses can be 5-bed houses for little extra cost
- Light-weight structural strength - Saves on foundations. Pile and pad foundations are a real alternative.



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