

Construction

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.

OSB

OSB/3 board comprises softwood flakes/strands bonded together with MUPF (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 SBS 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 SBS polyurethane core is typically $0.025 \text{ W/m}^2 \cdot \text{°K}$. Using the SIPs panel can provide extremely low U-values for walls. Depending on detail of construction this can be in the range 0.21 to $0.14 \text{ W/m}^2 \cdot \text{°K}$.

For roofs designs can deliver U-values in the range 0.20 to $0.12 \text{ W/m}^2 \cdot \text{°K}$.



SBS 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.

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

Acoustics

Acoustic insulation between rooms and externally is improved by the plasterboard lining. SBS 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.

Technical data

Airtightness and ventilation

Use of the SIPs panel and jointing system can create an airtight structure that will meet requirements in the new 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. SBS 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.

SBS panels have been subjected to a number of testing procedures. These include loading the panels with a uniformly distributed load ('udl') to measure strength and deflection between two supports, axial loads centrally and eccentrically placed, racking loads and shear and bending loads on the panel joints.

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.

SBS will be happy to provide guidance to structural designers.

Structural strength

Uniformly distributed load

Tests on a 4m single span of 150mm thickness SIPs showed ultimate failure at 18kN/m².

Assuming serviceability deflection at a nominal L/200 the load for the 4m span was 2kN/m².

It is therefore the deflection of the panel that routinely becomes the limiting factor in the design process. This increases user confidence knowing that safe working loads are well in excess of standard deflection limits.

Axial load

Axial loading tests on panels 100m thick, 2.4m in height and 2.4m in width were seen to fail at a load of 440kN/m. Using a factor of safety of 2.0 it is seen that panels will comfortably support a vertical load of 90 kN/m. These loads are well in excess of the average foundation loading from a typical two-storey house of traditional construction.

Advantages of SIPs

- Environmentally friendly – ODP zero insulation core and OSB from sustainable forest resources
- Excellent thermal performance – insulation U-value, lack of thermal bridging and airtightness
- Save construction time and cost – large engineered components,
- Space-maximising design flexibility – for housing the open habitable roof space is a winner. 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



SIP Building Systems Limited

Unit 2, Expressway Industrial Estate
Turnall Road, Ditton, Widnes
Cheshire WA8 8RD

Tel: 0870 224 8040 Fax: 0870 224 8041

Email: sales@sipbuildingsystems.co.uk

www.sipbuildingsystems.co.uk