

Technical Information - Fire

At a glance

- The Low Carbon Construction Building System achieves up to 75 minutes fire resistance (integrity and insulation) under LPCB Certification Standards 1208 and 1181-1. The LPS Certificates utilise the relevant test methods in accordance with BS 476: Part 21: 1987 and BS 476: Part 22:1987.
- Links to Hemsec Certification can be found on the Red Book Live: <http://www.redbooklive.com/index.jsp>
- Additional information on fire can be found on Hemsec's BBA Certificate 06/4374, section 10: www.bbacerts.co.uk

More detail

Fire resistance is defined as the ability of an element to continue to perform despite being subjected to fire. All structures have to comply with the fire performance requirements set out by the Building Regulations but it is not difficult for SIP buildings to meet the required levels given the correct design, manufacturing standard and workmanship.

The Building Regulations have specified periods of fire resistance as well as surface spread of flame categories that all buildings need to comply with. SIP structures can be designed to meet Class O surface spread of flame and provide up to 60 minutes fire resistance. The Low Carbon Construction Building System exceeds the Building Regulations with regard to fire resistance. The system achieved up to 75 minutes resistance (integrity and insulation) under LPCB Certification Standards 1208 and 1181-1.

Ignition and fire growth and the fully developed fire are the two main stages of fire recognised and reflected in the testing and determining of fire performance of structures. The ignition and fire growth stage covers aspects such as ignitability, combustibility and the contribution of materials to the progression of fire. SIP structures do not contribute to the growth of fires as they are typically covered with non-combustible wall linings. During the fully developed fire stage, a material should contribute to the fire resistance of an element of a building.

External walls	The fire resistance of SIP walls is provided by the wall lining (typically plasterboard, although it is possible for other types of fire resistant board to be used). One layer of 12.5mm Gyproc Wallboard and one layer of 12.5mm Gyproc Fireline on 25x10mm timber battens provides up to 60 minutes fire resistance.
Internal walls	Internal walls are formed using 100mm SIP panels, combined with fire resistant wall linings to provide a fire resistance. Internal non-loadbearing walls require either no specific fire resistance or 30 minutes, achieved using a single layer of wallboard. Load bearing internal walls require 30 to 60 minutes fire resistance depending on the size and fire resistance performance of the elements they support. The required periods of fire resistance are provided with either one or two (60 minutes) layers of plasterboard.
Party walls	Party walls are constructed from SIPs. The size and type of building will influence the fire resistance requirements, although 60 minutes is typical for a party wall specification for buildings up to seven stories. It is unlikely that loadbearing SIPs will exceed this size. SIP party walls consist of two separate leaves of SIPs separated by a cavity. One layer of 12.5mm Gyproc Wallboard and one layer of 12.5mm Gyproc Fireline on 25x10mm timber battens to the external faces provide 60 minutes fire resistance and are also sufficient to meet acoustic requirements. Services that perforate the plasterboard should not ideally be installed on party walls however if they are, fire resistant pattress box inserts should be used.

Floor	The Low Carbon Construction Building System utilises SIP floors in the construction of buildings.
Roof	Roof structures do not require specific periods of fire resistance unless it forms a habitable room, where 30 to 60 minutes fire resistance is required, or the roof is part of the escape route, where the requirements are considered on a project specific basis.
Cavity barriers	<p>Cavity barriers stop the spread of smoke through cavities and concealed spaces. The Building Regulations require that the cavity edges are closed and cavity barriers provided at compartment wall and floor junctions with external walls or other compartment walls. Each cavity barrier should provide a minimum of 30 minutes fire resistance. Cavity barriers are typically made of:</p> <ul style="list-style-type: none"> • 38mm thick timber • Polythene sleeved mineral wool or mineral wool slab under compression when installed • 50mm thick wire reinforced mineral wool blanket • 12.5mm thick calcium silicate, cement or gypsum based boards • 0.5mm thick steel <p>The requirements for installing cavity barriers in a SIP structure are the same as load bearing timber studwork structures.</p>

Where a building is constructed within 1m of a relevant or notional boundary, the specified 30 to 60 minute periods of fire resistance is required for both the inside and outside of the building. Depending on the cladding, it may be necessary to include layers of fire resistant board on the outer face of the SIP.

BRE information paper ref: IP21/10 summarises the results of a number of fire resistance tests, done on small and large scale SIP building samples, to determine the performance of SIP systems exposed to realistic fire scenarios.

As with all types of construction, smoke alarms should be fitted and tested regularly.

END