Structherm | Fastbuild™

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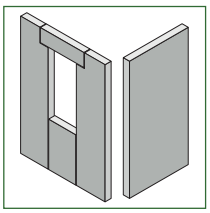
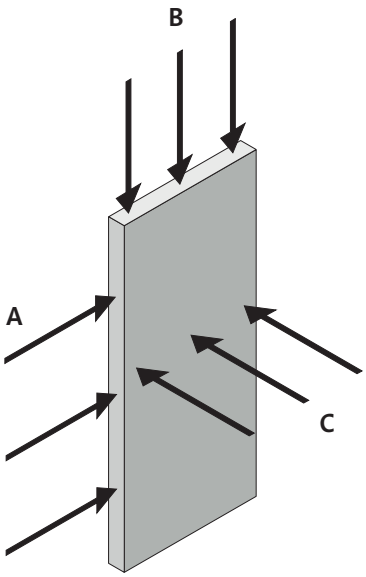
STRUCTURAL & FIRE PERFORMANCE

Structherm® BUILDING SYSTEMS

Buildings to be constructed with the Fastbuild™ method are designed to BS 8110 and Structherm's own full scale test data.

FASTBUILD™





A: Racking shear

B: Vertical load (axial)

C: Horizontal load (transverse)

Three principles of wall design used as the basis for laboratory structural testing

Structural Performance

Fastbuild™ is a building panel system for which there are no historic design standards that specifically detail the design methodology designers and engineers should employ. Fastbuild™ has undergone a substantial load testing programme to justify the design principles as well as BBA approval for the system.

LABC (Local Authority Building Control) has independently assessed the test results and has approved the use of Fastbuild™ in structures up to 6 storeys.

Full scale structural testing on Fastbuild™ for resistance to compression, flexure, and shear (racking) has been conducted at CERAM Building Technology, a UKAS accredited laboratory to British/European test methods.

The solid panels are manufactured with a 14mm minimum coarse aggregate that achieves 50 N/mm² at 28 days.

Vertical load capacity

With reference to the masonry code BS 5628: 2 and the timber code BS 5268: 1, a 100mm thick, 3.0m high Fastbuild™ wall panel is comparatively 6 times stronger than a 7 N/mm² block wall and 20 times stronger than a timber frame panel.

In accordance with BS 8110: 1 Fastbuild™ slenderness ratio le/h should not exceed 30, whether the wall is braced or unbraced. This is superior to both masonry and timber, which do not allow a slenderness ratio greater than 27. The superior slenderness ratio allows taller panels to be implemented without reducing internal floor area.

TABLE 1 - AXIAL DESIGN CAPACITY OF SOLID FASTBUILD PANELS (kN/m)

Load Type		Panel Height (m) 2.4	2.55	2.7	3.0
Characteristic vertical load resistance (kN/m)	100*	887	837	789	702
	125*	1333	1274	1217	1109
Characteristic vertical load resistance allowing h/3 eccentricity (kN/m)	100*	390	379	369	349
	125*	531	521	512	491

** Panel thickness in mm*

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Horizontal load capacity

Fastbuild™ is designed to span between floors for the support of horizontal loads. Floor diaphragms and roof bracing will be designed to provide horizontal support at both panel head and base.

The individual panel capacities and overall stability of the structure are designed to resist the design wind pressures as specified by BS 6399: 2.

Disproportionate collapse

The Fastbuild™ structure will be designed to satisfy the Building Regulation Approved Document A: 2004 edition requirements for disproportionate collapse.

The LABC and BBA have verified that the standard Fastbuild™ connection details satisfy the 2A classification under the Building Regulations. Where 2B class is required there are two approaches to strengthen the building.

Option 1

The Fastbuild™ design procedure for disproportionate collapse is the inclusion of key 'protected elements'. The protected element is either a solid reinforced special panel or light steel posts within the wall designed to withstand accidental loading of 34 kN/m² (BS 5628-1 37.1).

External and internal walls that carry floor load require additional protected elements to be integrated between the crosswalls at 3–3.5m centres as part of the Fastbuild™ general arrangement. These elements are designed with sufficient head and base fixity to resist the resultant horizontal force.

Option 2

Utilises a lattice girder precast concrete insitu permanent formwork flooring system. This allows integral reinforced concrete beam strips to be incorporated into the floor structure.

Brick ties

A Helifix wall tie fixed into the panel provides a 1.8 kN allowable pullout load. For ties placed at 2.5 per m² the design load is 2.5 times greater than the maximum net surface wind pressure experienced within the British Isles.

Fire Performance

The solid Fastbuild™ panels designed in accordance with BS 8110: 2 have a 1% reinforcement ratio, therefore a 100mm panel achieves a 1.5 hour fire rating.

Solid concrete has no surface spread of flame, therefore is specified as Class 0.

Structherm BUILDING SYSTEMS

For more information about Structherm products, please contact us or visit our website:

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