



Innovation you can trust



**Fastbuild**  
The sustainable benefits

Structherm's Fastbuild pre-fabricated building system offers a sustainable method of construction achieving the demanding standards set by recent legislation. The following statement outlines the various issues that embrace the Egan principles. The product, however, is constantly undergoing rigorous testing and further development to achieve constant improvement in line with the demands of the industry.

The M4i have developed Environmental Performance Indicators (EPI) to promote sustainable and environmentally friendly products within construction projects. With reference to the indicators the environmental benefits of the Fastbuild system are defined.

## Operational Energy

Fastbuild enables the use of passive engineering techniques such as thermal mass, to achieve stable thermal environments via renewable energy sources, this greatly reduces energy consumption. Heating and cooling systems need only to be used for 'top up' activity during the day, this in turn will generate huge savings in energy costs throughout the whole life of the building, as well as substantial reduction in carbon dioxide emissions.

## Embodied Energy

The Fastbuild product minimises manufacturing energy by locally sourcing its materials and by achieving no material wastage. In addition Fastbuild is a pre-engineered system, which has the ability to design out waste at the design stage, thus further reducing the environmental impact from "cradle to the grave".

An environmental profile clearly defines that the higher embodied energy endured at the manufacturing stage is heavily compensated at both the design and installation stage.

## Transport

Transportation is minimised twofold, primarily the number of material deliveries are substantially reduced. Typically a two storey educational building requires around 48 deliveries – this is reduced to 19 for the same external and internal wall area. Secondly the Fastbuild construction programme minimises staff journeys to and from the site and potential road traffic surrounding the site.

## Environmental

The Clean Air Act and Agenda 21 (Earth Summit) have placed great emphasis in environmentally evolving the current construction materials. Fastbuild fully complies with the Clean Air Act, as the encased insulation board is CFC, HCFC free and contains no ozone depleting substances. Similarly a high percentage of the material for Fastbuild is recyclable and if the Fastbuild system is to be dismantled, the solid panels can be recycled as hard core for road foundations. Additionally, the

controlled Fastbuild installation process creates less dust pollution, noise exposure, and debris.

## Durability

An independent assessment by the BBA guaranteed that the Fastbuild panel system would retain its strength and insulating properties for a service life at least equivalent to that of brick and block masonry.

Vapour permeability of the external wall construction and condensation control is essential for the long-term energy efficiency of the wall, and resistance to deterioration. Interstitial condensation can occur where the material layers within the construction layer allow the air to drop below dew point. All Fastbuild panel construction formats ensure the air temperature is kept above dew point throughout the year. Structherm provides a bespoke dew point calculation for each project.

## System Flexibility

The Fastbuild system offers both the designer and the client a great deal of flexibility when developing the external and internal layout. Fastbuild's inherent strength allows for far less internal structural walls, opening the building up for multiple uses.

Future modifications i.e. openings within the structural walls can be incorporated at the design stage by introducing a false wall. The suitable panel length to achieve the opening is omitted from the panel drawing and replaced with a structural opening comprising of a concrete lintel sat onto two notched panels. Dependent on the wall's fire and acoustic requirement, the non-structural zone below the lintel can be blocked up. The main benefit with this solution is that the infill material can be removed easily at a later stage without any need for any structural propping.

A panelised system, where the maximum panel width is 1250mm can incorporate unlimited extension possibilities. The Fastbuild external shell comprises of a number of discrete individual panels, which can be easily lifted out once the outer leaf has been dismantled. The essential benefits are that the aperture created is neat, dimensionally accurate and quick to achieve. Dependent on the aperture a lintel could be introduced into the system or similar to blockwork, a goal post incorporated to span the opening.

In accordance with the axonometric panel layout the designers at Structherm can suggest the appropriate structural layout to achieve the recommended building modification requirement.

## Sound Resisting Wall

A typical domestic Fastbuild construction would have two leafs of 100mm thick solid concrete with sealed joints, with a 50mm mineral wool cavity layer and faced both sides with 12.5mm plasterboard. The party wall

would run straight through into the external leaf, minimising flanking paths through the external wall, thus providing a sound insulation value that exceeds current building regulation requirements.

## Fire

In agreement with BS8110: 2, the results from the fire test specified in BS 476:8 can be directly applied as the fire resistance of the panel. An assessment by the Loss Prevention Council indicated the insulated panel, lined on one face with plasterboard 12.5mm thick, would be suitable for installations where a fire rating of one hour is specified. The panels, without plasterboard achieved a Class 1 rating.

The solid Fastbuild panels designed in accordance with BS8110: 2 have a 1% reinforcement ratio; therefore a 100mm panel achieves a 1.5hour fire rating.

Solid concrete has no surface spread, therefore is specified as Class o.

## Safety

Fastbuild makes significant contribution to site Health & Safety as Fast track construction programmes reduces site exposure for both operatives and neighbours. Similarly site tidiness and staggered panel deliveries maintains a clean and manageable site, even on the tightest footprints.

The Manufacturing process and site installation have been simultaneously audited by the DTI funded scheme HASPREST to identify the H&S benefits actually realised in practise.

## Thermal Performance

The Fastbuild panel is a high strength element with exceptional insulating properties. Using the elemental method, the Fastbuild panel can achieve far superior U-values comparable to high strength load bearing masonry, this offers further and substantial cost savings.

Fastbuild can be easily integrated into a number of different types of wall constructions and satisfy the minimum required U-value of 0.35 W/m<sup>2</sup>K for the current Part L: 2002.

The most effective wall configurations in terms of capital cost and energy efficiency to meet the U-value requirements are tabulated.

- Single leaf Fastbuild panel with single leaf brickwork with partial fill cavity insulation – [Table.4](#). Partial fill cavity wall insulation materials specified are BBA approved, therefore the minimum 25mm residual cavity stated in Part C of the building regulation is achieved with a 75mm cavity.
- Single leaf Fastbuild panel with single leaf brickwork with full fill cavity insulation – [Table.5](#)
- Single leaf Fastbuild panel with external wall insulation and render finish – [Table.6](#)

Panel	Cavity Insulation			U-value
Type	Type	Thermal Conductivity W/mK	Thickness (mm)	(W/m <sup>2</sup> K)
FB 100	PHENOLIC	0.019	30	0.33
	PUR	0.022	40	0.32
		0.022	50	0.28
	EXTRUDED	0.028	50	0.32

Table 4

Panel	Cavity Insulation			U-value
Type	Type	Thermal Conductivity W/mK	Thickness (mm)	(W/m <sup>2</sup> K)
FB 100	MINERAL FIBRE	0.036	75	0.3
	EPS	0.038	75	0.31

Table 5

Panel	External Wall Insulation			U-value
Type	Type	Thermal Conductivity W/mK	Thickness (mm)	(W/m <sup>2</sup> K)
FB 100	PHENOLIC	0.019	40	0.31
		0.019	60	0.23
	MINERAL FIBRE	0.036	75	0.32
		0.036	100	0.26
	EPS	0.038	100	0.27

Table 6

Fastbuild is completely enveloped in insulating material, therefore thermal bridging via the concrete edges has a minimal effect on the overall U-value, but is included into the calculation. The use of solid concrete lintels deems to satisfy the poorest acceptable U-value.

All Structerm Fastbuild details are produced to comply with the Building Regulation robust details as published under guidance from DEFRA and DTLR.

A Fastbuild structure can significantly exceed industry standard for air tightness. The panels are manufactured from dense concrete, the percentage of joints are greatly reduced from that experienced on block work construction and the whole building is enveloped in insulation.

## Thermal Comfort

Fastbuild exploits the concrete capacity to act as a thermal store. As the surrounding air temperature increase, heat is absorbed by the panel's concrete mass. As the temperature decreases, this stored heat is gradually released into the building. In addition to providing a stable comfortable environment that is cool in the summer and warm in the winter, heating and cooling systems can simultaneously operate with minimal energy input.

# Fastbuild | Concrete

## Providing a sustainable solution - a versatile material vital to our society

We can define sustainability as 'ensuring that development meets the needs of the present, without compromising the ability of future generations to meet their own needs'.

Sustainable development means:

1. Reduction of emissions
2. More efficient use of resources
3. Better re-use of waste
4. Increased consideration for people's health & safety

### How does concrete support sustainability

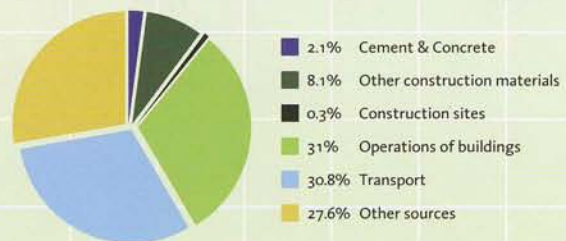
- Using concrete in construction provides employment for around 1.5 million people.
- Concrete has excellent fire resistance properties, is non-combustible and has a very slow rate of heat transfer. Concrete will not emit harmful emissions, even in the hottest fire.
- Concrete is also effective at protecting against noise - (see details in main brochure).
- Whereas timber requires a variety of protective treatments, concrete requires no toxic treatment to protect it from deterioration - thus does not contribute to symptoms of 'sick building syndrome' (SBS).
- Concrete is regarded as the best of all materials to improve indoor air quality.
- Concrete provides far better airtightness than lightweight frames.
- Concrete produced in the UK does not rely on any imported materials or products, whereas other structural materials are often imported from as far as North America and Canada.
- Concrete gives a better than average embodied energy performance compared to structural steel.
- Concrete waste can be crushed and reused as aggregate.
- The Thermal capacity (mass) of concrete enables it to absorb and later radiate heat. By reducing the need for air conditioning, emissions of CO<sub>2</sub> can be reduced by over 50% over a building's life.

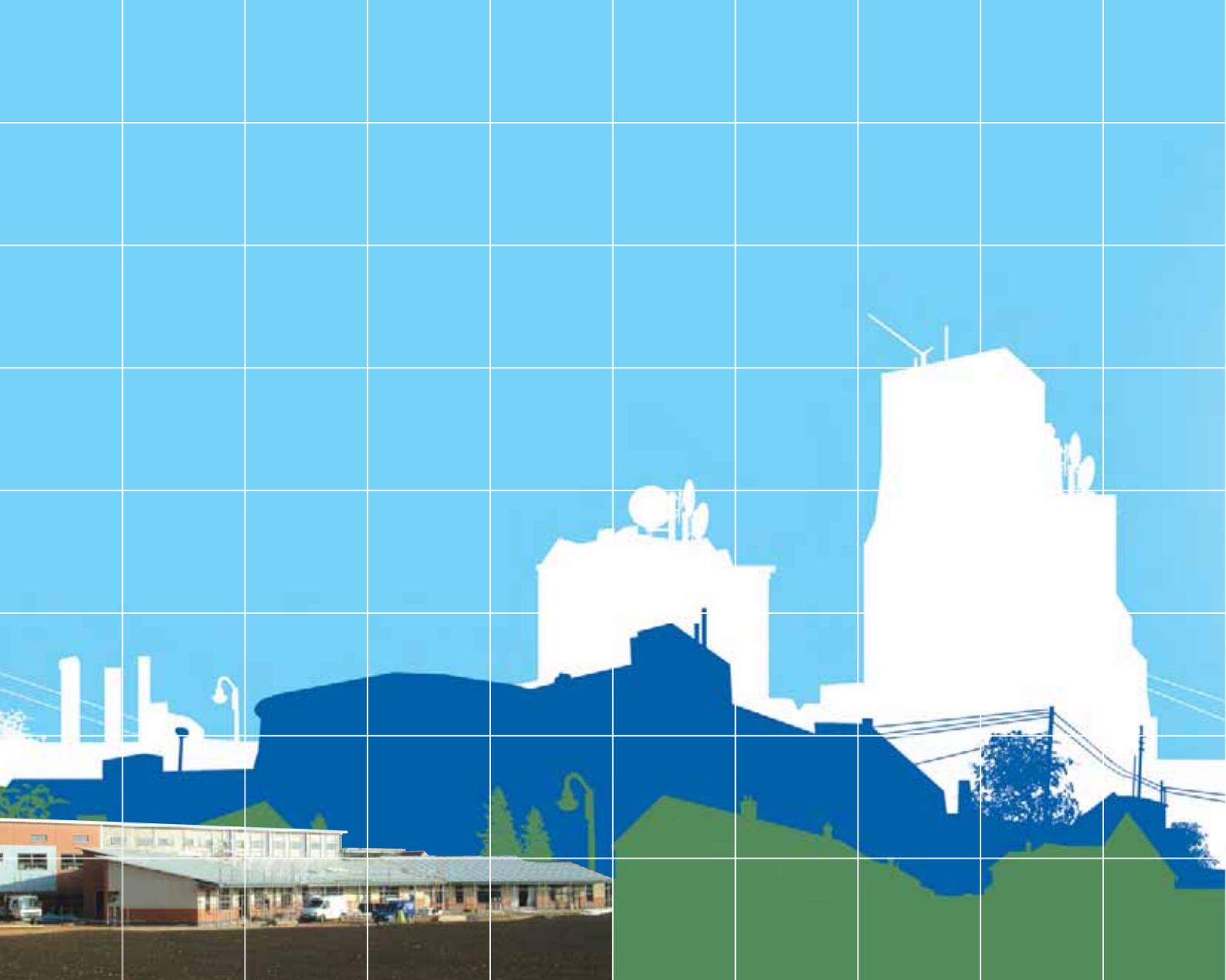


### Designing with Fastbuild

Eco-designers believe the way to sustainable building lies in long-life, adaptable, low-energy design. The earth's resources are best conserved if the service of life on a building is prolonged, so that durability and longevity of concrete make it an ideal choice. Anticipating and designing in flexibility for change of use can also extend service life. Fastbuild offers designers a better long-term way of achieving these designs.

### Concrete environmental impacts in perspective





For more information about Structherm products, please contact us or visit our website at [www.structherm.co.uk](http://www.structherm.co.uk)

**Head office**

Structherm Ltd  
Bent Ley Road  
Meltham  
Holmfirth  
West Yorkshire  
HD9 4AP

Tel: +44 (0) 1484 850 098  
Fax: +44 (0) 1484 851388  
Email: [sales@structherm.co.uk](mailto:sales@structherm.co.uk)  
[www.structherm.co.uk](http://www.structherm.co.uk)

The company pursues a policy of constant product development and information contained in this publication is therefore subject to change without notice.