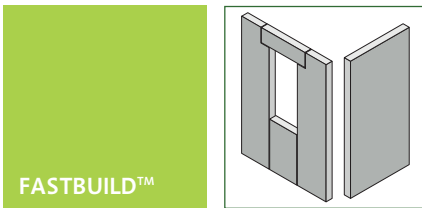


Uniclass	G25:JB1		
CI/SfB	(21)	(22)	

THERMAL PERFORMANCE



Thermal performance is a pre-requisite on all Fastbuild™ schemes. Whether the client's project is within the housing, education, commercial or other industry sectors, current Building Regulations will be achieved or exceeded.



Thermal performance and thermal mass design

The Fastbuild™ system can be clad with many insulated cladding materials as highlighted in Datasheet 3.

Listed below are two typical examples of wall constructions showing the U-value achieved. Structherm can provide U-value calculations to reflect the chosen wall construction using the latest software design packages.

If the Structherm BBA-approved, rendered external wall insulation systems are used, then a very high level of thermal efficiency can be achieved with a minimal wall thickness. Also, the monolithic nature of the render provides excellent air tightness to the structure. The panel-to-panel joints are sealed with a thixotropic cementitious mortar that provides a good airtight seal between the panels which is simple to apply and flows easily through the joints.

The Fastbuild™ system uses dense concrete components including the floors and stairs. The floor slabs can be left exposed on the soffit to provide a high level of admittance to the structure. This allows the floor slabs to act as heat sinks. Hollow-core concrete planks can be incorporated that utilise the hollow core as part of the comfort cooling or heating ventilation system.

TYPICAL WALL CONSTRUCTION - EXAMPLE 1

Project Information

Date: February 2005
 Project: Fastbuild™ with partial fill cavity wall

Construction Type

Element: Wall – 100mm Fastbuild™
 Insulation – 50mm

Internal surface emissivity: High
 External surface emissivity: High
 Building use: BS 5250 dry/moist occupancy

Construction Characteristics

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m²K/W)	Vapour Resistivity (MN/gm)	Vapour Resistance (MN/g)
Outside surface resistance	–	–	0.040	–	–
Brick (dense, external)	102.5	1.099	0.093	80.00	8.20
Cavity >24mm, wall	–	–	0.180	–	0.00
Insulation	50.0	0.022	2.273	20000.00	1000.00
Concrete, dense (Fastbuild™)	100.0	1.667	0.060	200.00	20.00
Cavity <25mm	–	–	0.100	–	0.00
Plasterboard	12.5	0.160	0.080	60.00	0.75
Inside surface resistance	–	–	0.130	–	–

U-value: 0.35 W/m²K

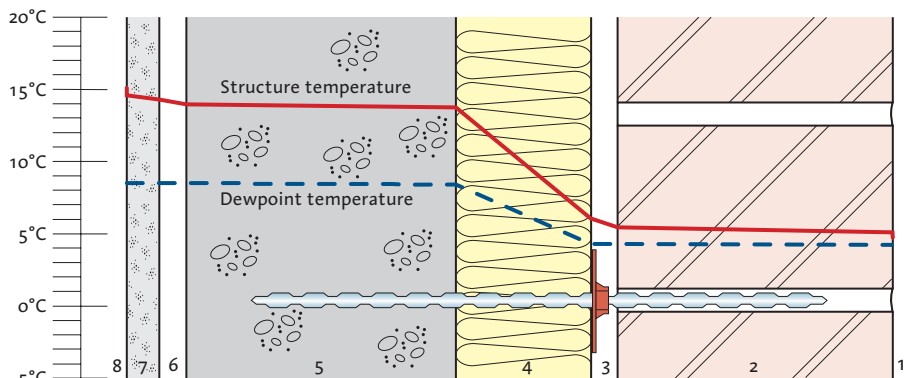
U-value, Combined Method: 0.34W/m²K (upper/lower limit 2.962/2.961 m²K/W, dUf 0.0000, dUg 0.0000, dUp 0.0000, dUr 0.0000)

(Correction for mechanical fasteners: Delta Uf = 0.017 W/m²K)
 (Correction for air gaps: Delta Ug = 0.000 W/m²K)

(Based on the Combined Method for determining U-values of structures containing repeating thermal bridges)

Condensation Risk Analysis (no account taken of thermal bridges)

Internal/external conditions: 15.0°C @ 65.0% RH, 5.0°C @ 95.0% RH. Buildup period 60 days
 Inside surface resistance 0.08, Outside surface resistance 0.04



Notes:

- 1. Outside surface resistance
- 2. Brick (dense, external)
- 3. Cavity >24mm, wall
- 4. Insulation
- 5. Concrete, dense (Fastbuild™)
- 6. Cavity <25mm
- 7. Plasterboard
- 8. Inside surface resistance

TYPICAL WALL CONSTRUCTION - EXAMPLE 2

Project Information

Date: January 2003
Project: Fastbuild™ with Structherm External Wall Insulation

Construction Type

Element: Wall – 100mm Fastbuild™
Insulation – 140mm (part of Structherm NSC 2)

Internal surface emissivity: High
External surface emissivity: High
Building use: BS 5250 dry/moist occupancy

Construction Characteristics

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m ² K/W)	Vapour Resistivity (MNs/gm)	Vapour Resistance (MNs/g)
Outside surface resistance	–	–	–	–	–
Render	6.0	0.556	0.011	100.00	0.60
Expanded polystyrene	140.0	0.038	3.684	300.00	42.00
Concrete, dense (Fastbuild™)	100.0	1.667	0.060	200.00	20.00
Cavity <25mm	–	–	0.100	–	0.00
Plasterboard	12.5	0.179	0.070	60.00	0.75
Inside surface resistance	–	–	0.080	–	–

U-value: 0.25 W/m²K

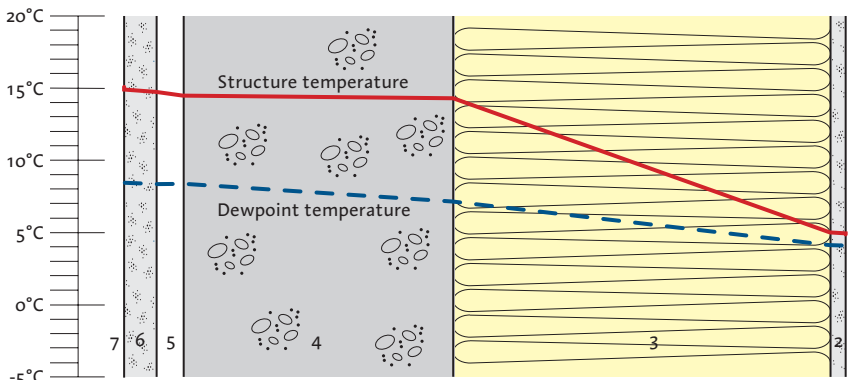
U-value, Combined Method: 0.25 W/m²K (upper/lower limit 4.045/4.045 m²K/W, dUf 0.0000, dUg 0.0000, dUp 0.0000, dUr 0.0000)

(Correction for mechanical fasteners: Delta Uf = 0.000 W/m²K)
(Correction for air gaps: Delta Ug = 0.000 W/m²K)



Condensation Risk Analysis (no account taken of thermal bridges)

Internal/external conditions: 15.0°C @ 65.0% RH, 5.0°C @ 95.0% RH. Buildup period 60 days
Inside surface resistance 0.08, Outside surface resistance 0.04



Notes:

1. Outside surface resistance
2. Render
3. Expanded polystyrene
4. Concrete, dense (Fastbuild™)
5. Cavity <25mm
6. Plasterboard
7. Inside surface resistance

