marmox thermoblock
Reduce heat loss at the base of walls

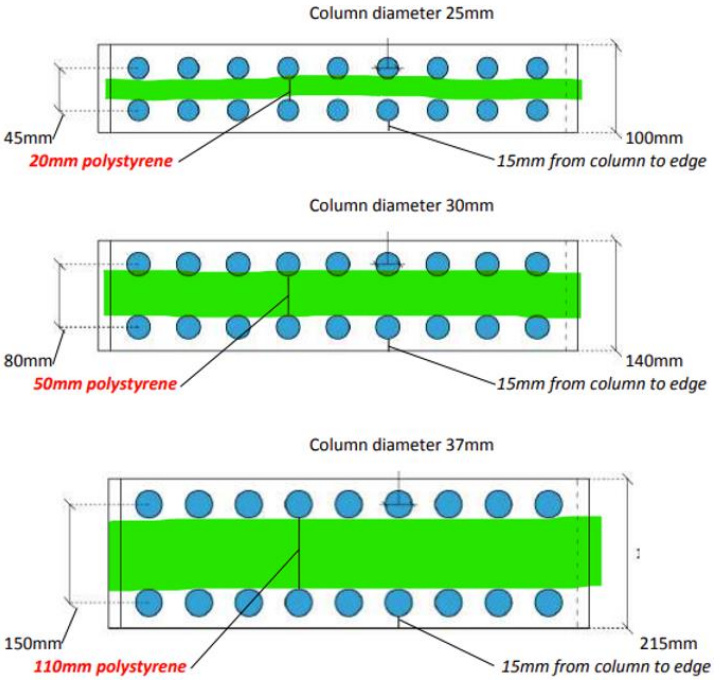
Specifications at the base of SIP and Timber Frame Walls

This document contains THREE specifications using Thermoblock at the base of SIP and Timber Frame Walls with the following floor types

Junction Detail	Click the Hyper-link	SAP default ψ value	SBEM default ψ value	Guideline ψ values with Thermoblock
E5 Ground Floor to External Wall				
Timber Frame Wall / SIP – slab on ground (*insulation above slab*)	TFW1	0.32	0.36	0.04 - 0.05
Timber Frame Wall / SIP – slab on ground (*insulation below slab*)	TFW2	0.32	0.36	0.14 - 0.15
Timber Frame Wall / SIP - beam + block floor (*insulation below screed*)	TWF3	0.32	0.36	0.03 – 0.04

*The final column on the right shows the calculated ψ value in **BRE's Certified Thermal Details** using a typical BRE junction design into which Marmox Thermoblock has been incorporated.*

Several of these specifications require screws or bolts to pass through the Thermoblock to connect whatever is being fixed down (*for example a sole plate*) to the concrete block or concrete slab which the Thermoblock itself if fixed on to. In these situations, the fixings must pass through the part of the blocks which is XPS, not epoxy-concrete as shown by the green lines below.



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Specification to eliminate or reduce thermal bridge at the junction of a timber frame or SIP wall with the floor (not suspended)

INSULATION ABOVE SLAB

Specification:	**TFW1** *(Timber Frame Wall #1)*
Product ref:	**Marmox Thermoblock (Standard Type)**
Junction Type:	**E5**
Manufacturer:	**Marmox UK, Caxton House, 101 Hopewell Drive, Chatham, Kent ME5 7NP. 01634 835290; Email: sales@marmox.co.uk; http://www.marmox.co.uk/.**

Product Use: Elimination or reduction in cold bridging where the base of a timber frame wall / SIP wall unit meets the floor.
Reduction in the ψ value used in SAP/SBEM or DEAP/NEAP calculations to enable compliance with UK / Irish building regulations.

Description: Marmox Thermoblock is a load-bearing heat-insulating building block consisting of two rows of load-carrying epoxy-concrete columns of low thermal conductivity bonded to polymer concrete layers reinforced with fibreglass mesh which comprise the upper and lower surfaces. Thermally insulating Extruded Polystyrene surrounds the columns.

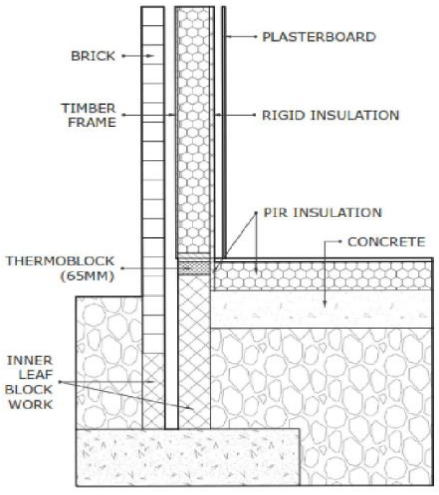
Properties: Declared λ value of 0.05W/mK (*to EN13164/EN13167*)
Mean compressive strength of 9.0N/mm^2 (*to EN772-1*)
Fire resistance >120minutes (*to EN1365-1*)
Water Absorption <3.5% (*to EN771-4*).

Dimensions: Length = 600mm, Thickness = 65mm or 100mm, Width = 100mm, 140mm or 215mm

Thermoblock is mortared into position directly underneath the sole plate which is mechanically fixed through the Thermoblock into the blocks below. *(Inclusion of Thermoblock means that perimeter insulation between the slab and the foundation wall is not necessary)*

Using SIPs - see additional notes on page 3

For example:



Example of ψ values with various wall types

Block conductivity (W/mK)	Wall U-value (W/m²K)	ψ-value (W/mK)	Temperature factor
0.85	0.20	0.046	0.92
0.85	0.17	0.053	0.92
0.85	0.16	0.049	0.93

These ψ values are guaranteed when used as with the materials and dimensions detailed in the BRE document: 'Certified Thermal Details' For variations and other details, Marmox UK is approved to calculate specific ψ values.

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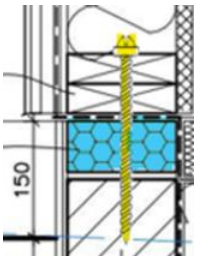
INSULATION ABOVE SLAB

A single course of Marmox Thermoblock: 600mm(l) x 100/140/215mm(w) x 65/100mm(ht) is used as the base onto which the sole plate sits. It should be positioned where it connects the floor insulation to the cavity insulation.

- Thermoblock is fixed to the foundation blocks with normal bricklayers' mortar.
- The length of Thermoblocks can be cut using a brick saw.
- At corners where a 90 degree angle is required, a flat short edge can be achieved either by cutting the block with a brick saw or cutting off the overlap which can be done using a hand saw
- Thermoblock edges are sealed together with a ribbon of Marmox MSP360 on the stepped edges to provide a waterproof barrier and improve air-tightness.
- The damp proof membrane from the floor is usually lapped over the row of Thermoblock (*secured in place with a bead of sealant, Marmox MSP-360*)

The top of the Thermoblock layer should be at least 150mm above ground height. If this is not the case, concrete/AAC blocks should be used beneath the Thermoblock to raise to timber sole plate to the required level.

- If levelling is necessary to provide a flat bed for the sole plate, packing with mortar on top of the Thermoblock (or DPM) can be done. If the Thermoblock base is completely flat, a bead of sealant/adhesive Marmox MSP-360 should be applied along the length of the Thermoblock layer to seal to the sole plate.
- The sole plate is now fixed directly onto the Thermoblock using mechanical fixings or straps.
- Fixing bolts / resin anchors are placed through the sole plate and then the Thermoblock halfway across its width into the solid base underneath. These *must penetrate the concrete / foundation blocks by at least 60mm*



Screw, bolt or resin fixing (shown in yellow) penetrating through the centre of the Thermoblock (shown in blue) into the blockwork below

- To avoid penetrating the DPM or when it is not possible to place a bolt halfway across the Thermoblock's width, straps or brackets are used. These must be fixed to the masonry components directly underneath the Thermoblock, not the Thermoblock itself

Authorities: BBA certified (10/4778)
ISO9001 (Bureau Veritas)
BRE – Certified Thermal Products Scheme, *http://www.bre.co.uk/certifiedthermalproducts/*
Fire Safety Report: 16781B (Warrington Fire)

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Specification to eliminate or reduce thermal bridge at the junction of a timber frame or SIP wall with the floor (not suspended)

INSULATION ABOVE SLAB

Important notes:

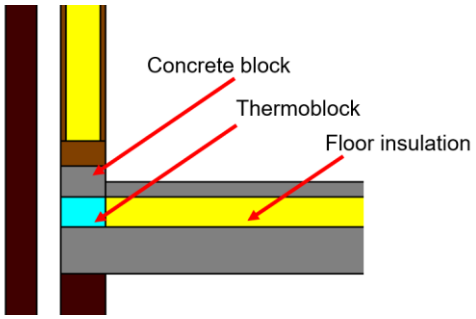
1) Thermoblocks should be fully supported and not span voids.
2) The sole plate on top of the Thermoblock cannot be more than 15mm narrower than the width of the Thermoblock.
3) The sole plate can be wider than the Thermoblock but should be placed centrally.
4) If it has to be placed eccentrically then the over-sail should be no more than 20% of the width of the Thermoblock.
5) Use one course only. Thermoblocks should not be laid on top of each other – *a 140mm height can be achieved by using a Thermoblock on top of a coursing block*.

ALTERNATIVE DETAIL

This approved method allows the sole plate to be fixed conventionally to the material directly underneath it. A Thermoblock will provide the same physical properties and stability of a conventional concrete block within an upstand therefore the fixing bolt need only be fixed into that block in top, it does not need to penetrate into the foundation/floor structure.

- A row of concrete blocks is mortared on top of the row of Thermoblocks
- The sole plate is fixed conventionally into those concrete blocks above the Thermoblock layer.

This method may also allow the floor insulation to be continuous with the Thermoblock.



Waterproofing: *Although when sealed together Thermoblock creates a permanent waterproof barrier, Thermoblock is not classified as a DPM.* A separate Damp Proof Membrane should therefore be included in the detail. The DPM can be fixed directly above or below the Thermoblock but because Thermoblock is waterproof, typically it is fixed above the Thermoblock layer.

A permanent waterproof barrier is created by sealing the block edges to each other with a sealant, **Marmox MSP360** (*300ml tubes*).

- 100mm wide blocks require 1 cartridge per 36 blocks
- 140mm wide blocks require 1 cartridge per 24 blocks
- 215mm wide blocks require 1 cartridge per 20 blocks

MSP-360 can also be used to seal the top surface of Thermoblock to the DPM/sole plate.

Extra Considerations when using with SIPs

With some SIPs, the OSB sheets are longer than the length of the frame so overhangs the base plate. These are designed so that the base plate rests on a timber sole plate with the two OSB overlapping wings encapsulating it. The SIP is secured by horizontally nailing those overlapping wings into the sole plate.

The sole plate cannot be replaced with a Thermoblock because it cannot be nailed into horizontally. As with a conventional timber frame, the sole plate must be fixed on top of a Thermoblock.

marmox thermoblock
Reduce heat loss at the base of walls

Specification to eliminate or reduce thermal bridge at the junction of a timber frame or SIP wall with a suspended floor

INSULATION BELOW SLAB

Specification:	**TFW2** *(Timber Frame Wall #2)*
Product ref:	**Marmox Thermoblock (Standard Type)**
Junction Type:	**E5**
Manufacturer:	**Marmox UK, Caxton House, 101 Hopewell Drive, Chatham, Kent ME5 7NP. 01634 835290; Email: sales@marmox.co.uk; http://www.marmox.co.uk/.**

Product Use: Elimination or reduction in cold bridging where the base of a timber frame or SIP wall meets the floor.
Reduction in the ψ value used in SAP/SBEM or DEAP/NEAP calculations to enable compliance with UK / Irish building regulations.

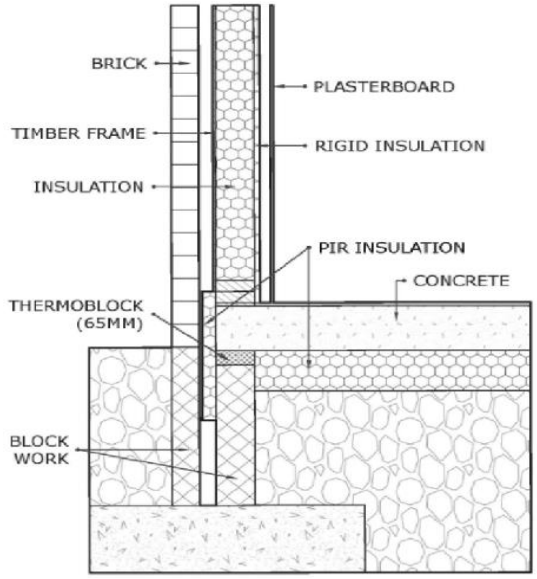
Description: Marmox Thermoblock is a load-bearing heat-insulating building block consisting of two rows of load-carrying epoxy-concrete columns of low thermal conductivity bonded to polymer concrete layers reinforced with fibreglass mesh which comprise the upper and lower surfaces. Thermally insulating Extruded Polystyrene surrounds the columns.

Properties: Declared λ value of 0.05W/mK (*to EN13164/EN13167*)
Mean compressive strength of 9.0N/mm^2 (*to EN772-1*)
Fire resistance >120minutes (*to EN1365-1*)
Water Absorption <3.5% (*to EN771-4*).

Dimensions: Length = 600mm, Thickness = 65mm or 100mm, Width = 100mm, 140mm or 215mm

A course of Thermoblock sits on top of the foundation blocks supporting the slab ideally connecting the floor and cavity insulation.

For example:



Example of ψ values with various wall types

Block conductivity (W/mK)	Wall U-value (W/m²K)	ψ-value (W/mK)	Temperature factor
0.85	0.20	0.142	0.88
0.85	0.17	0.148	0.89
0.85	0.16	0.147	0.89

These ψ values are guaranteed when used as with the materials and dimensions detailed in the BRE document: 'Certified Thermal Details' For variations and other details, Marmox UK is approved to calculate specific ψ values.

marmox thermoblock
Reduce heat loss at the base of walls

Specification to eliminate or reduce thermal bridge at the junction of a timber frame wall with a suspended floor

INSULATION BELOW SLAB

One course of Marmox Thermoblock (*600mm x 100mm/140mm/215mm x 65 or 100mm*) is fixed on the concrete/aircrete foundation blocks using ordinary bricklayers' mortar. It should be positioned so that as much of the floor insulation is in contact with the Thermoblock.

- The length of Thermoblocks can be cut using a brick saw.
- At corners where a 90 degree angle is required, a flat short edge can be achieved either by cutting the block with a brick saw or cutting off the overlap which can be done using a hand saw
- Thermoblock edges are sealed together with a ribbon of Marmox MSP360 on the stepped edges to provide a waterproof barrier and improve air-tightness.
- The concrete slab sits directly on the Thermoblock and must extend over the whole width of the Thermoblock.
- The top and bottom surfaces of the Thermoblock are cement-based therefore the slab can, if necessary, be fixed to the Marmox blocks using ordinary bricklayers' mortar.

Authorities: BBA certified (10/4778)
ISO9001 (Bureau Veritas)
BRE – Certified Thermal Products Scheme, *http://www.bre.co.uk/certifiedthermalproducts/*
Fire Safety Report: 16781B (Warrington Fire)

Important notes:

1. Thermoblocks should be fully supported and not span voids.
2. The foundation blocks which the Thermoblock are on must not be narrower.
3. **Use one course only.** Thermoblocks should not be laid on top of each other.

Waterproofing: A permanent waterproof barrier is created by sealing the block edges to each other with a sealant, **Marmox MSP360** (*300ml tubes*). Also used to seal the top surface of Thermoblock to the DPM.

- Marmox Thermoblock 100mm wide require 1 cartridge per 36 blocks
- Marmox Thermoblock 140mm wide require 1 cartridge per 24 blocks
- Marmox Thermoblock 215mm wide require 1 cartridge per 20 blocks

marmox thermoblock
Reduce heat loss at the base of walls

Specification to eliminate or reduce thermal bridge at the junction of a timber frame or SIP wall with a beam + block floor

INSULATION BELOW SCREED

Specification:	**TFW3** *(Timber Frame Wall #3)*
Product ref:	**Marmox Thermoblock (Standard Type)**
Junction Type:	**E5**
Manufacturer:	**Marmox UK, Caxton House, 101 Hopewell Drive, Chatham, Kent ME5 7NP. 01634 835290; Email: sales@marmox.co.uk; http://www.marmox.co.uk/.**

Product Use: Elimination or reduction in cold bridging where the base of a timber frame or SIP wall meets the floor.
Reduction in the ψ value used in SAP/SBEM or DEAP/NEAP calculations to enable compliance with UK / Irish building regulations.

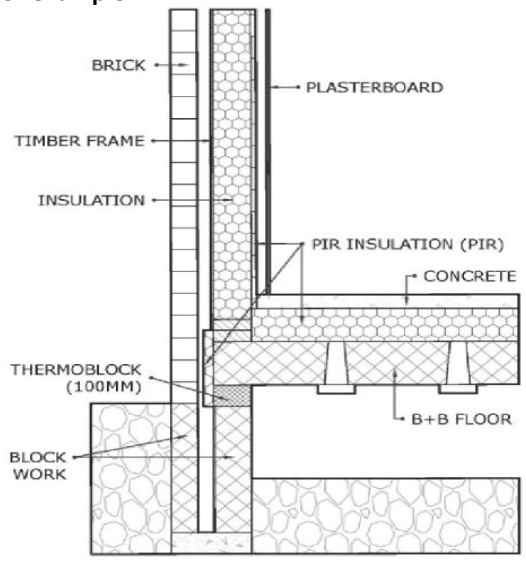
Description: Marmox Thermoblock is a load-bearing heat-insulating building block consisting of two rows of load-carrying epoxy-concrete columns of low thermal conductivity bonded to polymer concrete layers reinforced with fibreglass mesh which comprise the upper and lower surfaces. Thermally insulating Extruded Polystyrene surrounds the columns.

Properties: Declared λ value of 0.05W/mK (*to EN13164/EN13167*)
Mean compressive strength of 9.0N/mm^2 (*to EN772-1*)
Fire resistance >120minutes (*to EN1365-1*)
Water Absorption <3.5% (*to EN771-4*).

Dimensions: Length = 600mm, Thickness = 65mm or 100mm, Width = 100mm, 140mm or 215mm

A course of Thermoblock sits on top of the foundation blocks supporting the floor.

For example:



Example of ψ values with various wall types

Block conductivity (W/mK)	Wall U-value (W/m²K)	ψ-value (W/mK)	Temperature factor
0.85	0.20	0.035	0.93
0.85	0.17	0.033	0.94
0.85	0.16	0.030	0.94

These ψ values are guaranteed when used as with the materials and dimensions detailed in the BRE document: 'Certified Thermal Details' For variations and other details, Marmox UK is approved to calculate specific ψ values.

Variations to this example can be used – for example a course of Thermoblock can be used on top of the b+b floor, in which case Specs TFW1 or TFW2 may be more appropriate.

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Reduce heat loss at the base of walls

Specification to eliminate or reduce thermal bridge at the junction of a timber frame wall with a suspended floor

INSULATION BELOW SLAB

One course of Marmox Thermoblock (*600mm x 100mm/140mm/215mm x 65 or 100mm*) is fixed on the concrete/aircrete foundation blocks using ordinary bricklayers' mortar.

- The length of Thermoblocks can be cut using a brick saw.
- At corners where a 90 degree angle is required, a flat short edge can be achieved either by cutting the block with a brick saw or cutting off the overlap which can be done using a hand saw
- Thermoblock edges are sealed together with a ribbon of Marmox MSP360 on the stepped edges to provide a waterproof barrier and improve air-tightness.
- The concrete slab sits directly on the Thermoblock and must extend over the whole width of the Thermoblock.
- The top and bottom surfaces of the Thermoblock are cement-based therefore the slab can, if necessary, be fixed to the Marmox blocks using ordinary bricklayers' mortar.

An improvement in the ψ value may be achieved by having insulation in the wall cavity adjacent to the Thermoblock and running up to a height above the location of the sole plate.

Authorities: BBA certified (10/4778)
ISO9001 (Bureau Veritas)
BRE – Certified Thermal Products Scheme, http://www.bre.co.uk/certifiedthermalproducts/
Fire Safety Report: 16781B (Warrington Fire)

Important notes:

4. Thermoblocks should be fully supported and not span voids.
5. The foundation blocks the Thermoblocks are on must not be narrower.
6. **Use one course only**. Thermoblocks should not be laid on top of each other.

Waterproofing: A permanent waterproof barrier is created by sealing the block edges to each other with a sealant, **Marmox MSP360** (*300ml tubes*). Also used to seal the top surface of Thermoblock to the DPM.

- Marmox Thermoblock 100mm wide require 1 cartridge per 36 blocks
- Marmox Thermoblock 140mm wide require 1 cartridge per 24 blocks
- Marmox Thermoblock 215mm wide require 1 cartridge per 20 blocks