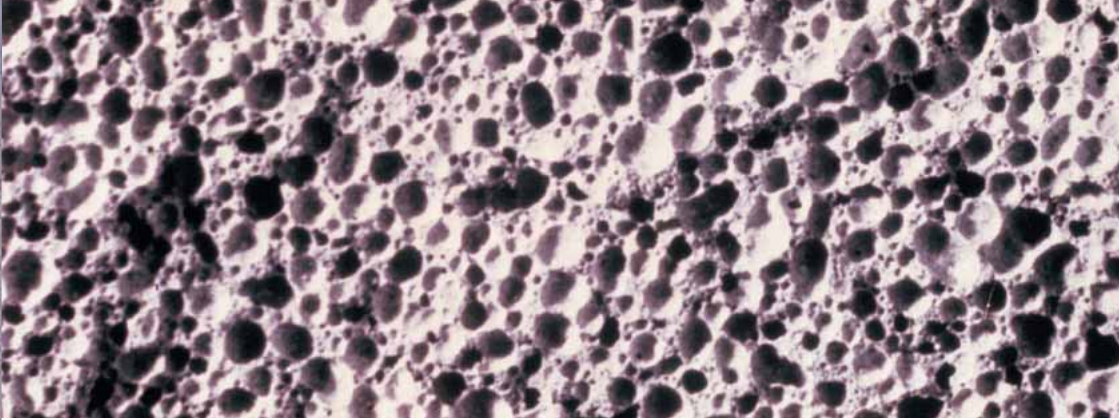




Guide to Aircrete Blocks

THERMALITE®





Introduction

Hanson's range of Thermalite aircrete blocks offers cost effective solutions for a wide range of applications. The micro-cellular structure of Thermalite, featuring millions of tiny pockets of trapped air, gives this product its distinctive features: high compressive strength, lightness for handling, high thermal insulation and moisture resistance.

Continual research and development has resulted in a range of building blocks that meet the demands of the modern construction industry. Consequently, the Thermalite range of aerated concrete blocks offers both builders and specifiers a wealth of benefits unrivalled by any other concrete block manufacturer.

Hanson - Building a sustainable future



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Why choose Thermalite?



Hanson's aircrete blocks are stocked in a large network of builders merchants across the UK, ensuring easy availability. The extensive product range means that a variety of tried and tested, cost-effective solutions can be offered for wall, floor and below-ground constructions.



Hanson manufactures its Thermalite product to a quality assured system in accordance with EN ISO 9001 and BS EN 771-4, ensuring compliance with all relevant standards and codes of practice. In addition, Thermalite products have independent accreditation from the British Board of Agrément.

All manufacturing locations hold a Kitemark licence and are certified by both the environmental manufacturing standard EN ISO 14001 and the Building Research Establishment (BRE).



Properties

High insulation

The excellent thermal performance of Thermalite aircrete can reduce the need for additional insulation materials.

Moisture resistant

Each Thermalite block contains millions of tiny pockets of trapped air, preventing the passage of water.

Fire resistant

All Thermalite products provide excellent fire protection, thus meeting building regulation requirements.

Frost resistant

Thermalite blocks offer superior protection against the effects of frost.

Strong

Thermalite products are very strong as well as lightweight and may be used in loadbearing walls for a structurally sound building.

Tel: 08705 626500

www.hanson.com/uk

email: thermalitesales@hanson.com

Workability

One hand lift

The light weight of Thermalite blocks ensures that they can be laid more quickly, leading to significant productivity gains for the builder.

Easily worked

There is no need for special tools as Thermalite blocks can be easily sawn, cut, chased and drilled using ordinary hand tools.

Easily fixed to

Generally, no special fixings need to be used with Thermalite products, which provide an ideal background for fixing household fittings using ordinary cut nails, direct screwing or screws with plugs.

Easy to finish

Thermalite blocks provide an excellent background for the use of internal and external finishes, whether it be plaster, render, painting or tiling.

Services

Customer service

Hanson has a reputation for first class customer care. Wherever you are, our dedicated Thermalite contact centre team will be able to help you with product information, quotations, orders, distribution facilities and stockist information.

Product Services

Hanson provides a full technical advisory service staffed by a qualified team with specialist knowledge on the use of Thermalite products. Technical advice can be provided on building regulations, including thermal calculations and energy ratings.

Website: www.hanson.com/uk

Visit our website for up to the minute information regarding our products and services.



Applications

The high level of performance achieved by Thermalite blocks, combined with the extensive product range offered, ensures that cost effective solutions for wall, floor and below ground constructions can be achieved. Thermalite products are available for use in all of the following applications.

Basements

The ability to assist in providing a barrier to moisture penetration and reducing the risk of condensation means that all Thermalite blocks are suitable for use in basements. Frost resistance and speed of construction are added benefits offered by Thermalite for use in this application.

Foundations • Trenchblock / Tongue & Groove

Trenchblock and Trenchblock Tongue & Groove have been specifically developed for use in the construction of solid foundation walls. By combining light weight with a large modular size, Trenchblock is a popular choice with builders. Trenchblock Tongue & Groove offers the addition of hand holds for even easier lifting along with tongue & groove joints which exclude the need for mortar in the perp-ends.

Beam & block floors • Floorblock

The Thermalite Floorblock system is designed for use with all proprietary T-beams. The use of Floorblock in conjunction with Trenchblock, will effectively contribute to meeting the thermal requirements of the Building Regulations.





Cavity walls • Shield • Turbo • Hi-Strength • Paint Grade Smooth

Shield and Turbo are most often used for the construction of inner leaves where they are used in conjunction with a cavity and a brick or block outer leaf.

As an alternative, Thermalite Hi-Strength 7 and Hi-Strength 10 are available for situations where loading conditions require 7.3N/mm^2 and 10.4N/mm^2 respectively. Additionally, Paint Grade Smooth is available for situations in which the builder wishes to achieve a painted finish.

Even higher thermal insulation values can be achieved by specifying Shield for the construction of the external leaf of a cavity wall which can either be rendered or clad with systems such as tile hanging or brick slips.

Solid walls • Shield • Turbo • Hi-Strength

Solid walls are a tried and tested, fast and efficient way of constructing walls which offer higher U-values. Shield and Turbo are produced in thicknesses suitable for solid wall construction. Alternatively, Hi-Strength 7 or Hi-Strength 10 may be used to meet special requirements.

Partitions • Shield • Party Wall • Paint Grade Smooth

Thermalite blocks are suitable for the construction of partition walls above and below dpc level. The use of Shield in single leaf partitions will greatly reduce sound transmission, as well as providing an ideal background for fixing shelves, radiators and bathroom fittings.

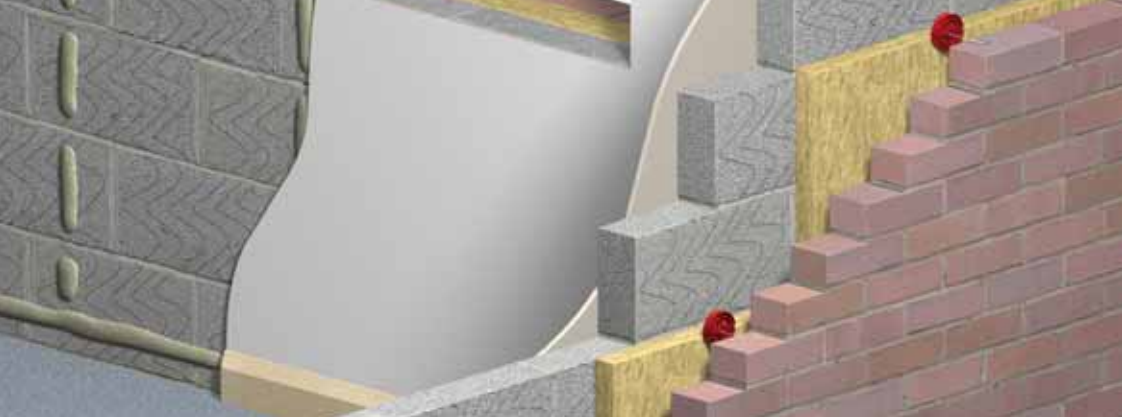
Separating walls • Party Wall • Shield • Hi-Strength 7 • Hi-Strength 10

Thermalite Party Wall, Shield, Hi-Strength 7 and Hi-Strength 10 blocks can be used in all types of sound insulating separating walls between dwellings.

Detailing • Coursing Brick

Thermalite Coursing Bricks are produced especially for coursing and bonding-in to enable walls to be constructed from uniform materials and prevent cold bridging.





Turbo

External walls • Foundations

2.9 N/mm²
0.11W/mK
470kg/m³

Turbo offers very high thermal insulation properties and is therefore ideal for external wall applications where low U-values are required.

- Available in large format
- For use with Thermalite Thin Layer Mortar
- Use only in soils up to Design Sulfate Class DS 3 below ground

Working dimensions

Face dimensions (mm) 440 x 215, 440 x 430

Thicknesses and weights

Block thicknesses and weights at equilibrium density (for 440 x 215mm)

Thickness (mm)	100	115	125	130	140	150	190	200	215	265	300*
Weight* (kg)	4.6	5.3	5.7	6.0	6.4	6.9	8.7	9.2	9.9	12.1	13.7

Properties

Mean compressive strength not less than 2.9N/mm²

Designed thermal conductivity (λ) 0.11W/mK

Specified gross dry density 470kg/m³

* Block weights are calculated using specified gross dry density, with a moisture content of 3% by weight added to provide the equilibrium value.

#Manufactured to special order only





Shield

External walls • Foundations • Partitions Separating walls



Shield combines all the normal qualities of Thermalite blocks with extremely high moisture resistance.

- Available in large format
- For use with Thermalite Thin Layer Mortar

3.6N/mm²
0.15W/mK
600kg/m³

Working dimensions

Face dimensions (mm) 440 x 215, 440 x 140, 440 x 430, 540 x 440†

Thicknesses and weights

Block thicknesses and weights at equilibrium density (for 440 x 215mm)

Thickness (mm)	75	90	100	125	140	150	190	200
Weight* (kg)	4.4	5.3	5.8	7.3	8.2	8.8	11.1	11.7

Properties

Mean compressive strength not less than 3.6N/mm²

Designed thermal conductivity (λ) 0.15W/mK

Specified gross dry density 600kg/m³

†Only available in 100mm thickness with a compressive strength of 3N/mm²

* Block weights are calculated using specified gross dry density, with a moisture content of 3% by weight added to provide the equilibrium value.





Hi-Strength 7

**External walls • Foundations • Partitions
Separating walls**

**7.3N/mm²
0.19W/mK
730kg/m³**

Hi-Strength 7 has been specifically designed for applications such as flats of three storeys and above, offices, supermarkets and retail parks, where loading conditions require a 7.3N/mm² building block.

- Available in large format
- For use with Thermalite Thin Layer Mortar

Working dimensions

Face dimensions (mm) 440 x 215, 440 x 430

Thicknesses and weights

Block thicknesses & weights at equilibrium density (for 440 x 215mm)

Thickness (mm)	100	140	150	190	200	215
Weight* (kg)	7.1	10.0	10.7	13.5	14.2	15.3

Properties

Mean compressive strength not less than 7.3N/mm²

Designed thermal conductivity (λ) 0.19W/mK

Specified gross dry density 730kg/m³

* Block weights are calculated using specified gross dry density, with a moisture content of 3% by weight added to provide the equilibrium value.





Hi-Strength 10

External walls • Foundations • Partitions

Separating walls



Hi-Strength 10 has been specifically developed for structural applications such as three or four storey buildings, where loading conditions require a 10.4N/mm^2 building block.

Hi-Strength 10 blocks are available in a range of thicknesses as a special order item only. Please consult Customer Services for full details.

8.7N/mm^2
 0.20W/mK
 770kg/m^3

Working dimensions

Face dimensions (mm) 440 x 215, 440 x 430

Thicknesses and weights

Block thicknesses & weights at equilibrium density (for 440 x 215mm)

Thickness (mm)	100	140	150	190	200	215
Weight* (kg)	7.5	10.5	11.3	14.3	15.0	16.1

Properties

Mean compressive strength not less than 8.7N/mm^2 †

Designed thermal conductivity (λ) 0.20W/mK

Specified gross dry density 770kg/m^3

* Block weights are calculated using specified gross dry density, with a moisture content of 3% by weight added to provide the equilibrium value.

† Blocks are manufactured to BS EN 771-4, Category 1, which allows the use of an enhanced partial safety factor (BS 5628).





Paint Grade Smooth

Inner leaf of external walls • Partitions Separating walls

4.0N/mm²
0.16W/mK
660kg/m³

Paint Grade Smooth is a paint grade block with the clean lines, even surfaces and neat sharp arrises that smooth faced walling demands. It is available for use in a variety of building projects such as leisure centres, retail buildings, offices and schools.

Note: If required, Paint Grade Smooth can also be laid fairfaced. However, consideration should be given to the fact that colour variation can occur.

It is recommended that a Paint Grade Smooth sample panel is erected for comparison purposes before construction commences and that selection is undertaken during construction. It may also be necessary to fill small blow holes before decoration.

Due to thickness variations within manufacturing tolerances, it may be difficult to build solid partition walls which have a smooth and even surface on both sides.

Working dimensions

Face dimensions (mm) 440 x 215

Thicknesses and weights

Block thicknesses and weights at equilibrium density (for 440 x 215mm)

Thickness (mm)	100	140	150	190	200	215
Weight* (kg)	6.4	9.0	9.6	12.2	12.9	13.8

Properties

Mean compressive strength not less than 4.0N/mm²

Designed thermal conductivity (λ) 0.16W/mK

Specified gross dry density 660kg/m³

* Block weights are calculated using specified gross dry density, with a moisture content of 3% by weight added to provide the equilibrium value.

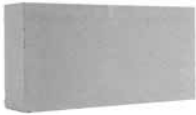




Hi-Strength Paint Grade Smooth

Inner leaf of external walls • Partitions

Separating walls



Hi-Strength Paint Grade Smooth combines the high quality appearance of Paint Grade Smooth with the compressive strength of Thermalite Hi-Strength blocks.

7.3N/mm²
0.19W/mK
730kg/m³

It is recommended that a Paint Grade Smooth sample panel is erected for comparison purposes before construction commences and that selection is undertaken during construction. It may also be necessary to fill small blow holes before decoration.

Due to thickness variations within manufacturing tolerances, it may be difficult to build solid partition walls which have a smooth and even surface on both sides.

Working dimensions

Face dimensions (mm) 440 x 215

Thicknesses and weights

Block thicknesses and weights at equilibrium density (for 440 x 215mm)

Thickness (mm)	100	140	150	190	200	215
Weight* (kg)	7.1	10.0	10.7	13.5	14.2	15.3

Properties

Mean compressive strength not less than 7.3N/mm²

Designed thermal conductivity (λ) 0.19W/mK

Specified gross dry density 730kg/m³

* Block weights are calculated using specified gross dry density, with a moisture content of 3% by weight added to provide the equilibrium value.





Trenchblock/Tongue & Groove

Hi-Strength Trenchblock/Tongue & Groove Foundations

Trenchblock/
Tongue &
Groove

3.6N/mm²
0.15W/mK
600kg/m³

Hi-Strength
Trenchblock/
Tongue &
Groove

7.3N/mm²
0.19W/mK
730kg/m³

Thermalite Trenchblock is a tried and tested, economical alternative to the construction of cavity walls with concrete infill, engineering bricks or heavy aggregate blocks for foundations.

Available as Hi-Strength Trenchblock where a strength of 7.3N/mm² is required.

- For use in soils of up to Design Sulfate Class DS 4
- Available with tongue and groove joints and handholds
- Improves thermal performance

Working dimensions

Face dimensions (mm) 440 x 215, 440 x 140*

Thicknesses and weights

Block thicknesses and weights at equilibrium density (for 440 x 215mm)

Thickness (mm)	255	275	300	355
Trenchblock weight (kg)	14.9	16.1	17.5	20.8
Hi-Strength Trenchblock weight (kg)	18.1	19.6	21.3	25.3

Properties

Mean compressive strength not less than 3.6N/mm²
(7.3N/mm²: Hi-Strength)

Designed thermal conductivity below ground (λ) 0.23W/mK
(0.31W/mK: Hi-Strength)

Specified gross dry density 600kg/m³ (730kg/m³: Hi-Strength)

*Not available with tongue and groove joints.





Floorblock

Beam & Block floors



Floorblock is an efficient method of providing insulated floors; it is light in weight and is designed for use with all proprietary T-beams.

Detailing is made simple by the availability of special Floor Endblocks and Coursing Slips in two modular bedding heights for closing at the edge of the floor.

Note: After the Floorblocks have been positioned, before any trafficking or loading is allowed and before any floor finish is commenced, the floor must be grouted with a 1:4 cement/sharp sand composition.

4.0N/mm²
0.16W/mK
660kg/m³

Working dimensions, thicknesses and weights

Floorblock face dimensions (mm)	440 x 350	440 x 215	440 x 540†
Block thickness (mm)	100	100	100
Block weight* (kg)	10.5	6.4	16.2
Floor Endblock face dimensions (mm)	440 x 140		
Block thickness (mm)	150	175	
Block weight* (kg)	6.0	7.0	
Coursing Slips face dimensions (mm)	215 x 100		
Block thickness (mm)	40	65	

Properties

Mean compressive strength not less than 4.0N/mm²

Designed thermal conductivity (λ) 0.16W/mK

Specified gross dry density 660kg/m³

* Block weights are calculated using specified gross dry density, with a moisture content of 3% by weight added to provide the equilibrium value.

† Blocks can be laid to correspond with 540mm beam spacing (660kg/m³ only)





Party Wall

Separating walls • External walls Partitions • Foundations

4.0N/mm²
0.16W/mK
660kg/m³

Party Wall is a lightweight concrete block that gives very high levels of sound reduction in separating walls between buildings.

- Suitable for both cavity and solid wall constructions
- Available in large format
- For use with Thermalite Thin Layer Mortar

Working dimensions

Face dimensions (mm) 440 x 215, 440 x 430*

Thicknesses and weights

Block thicknesses and weights at equilibrium density (for 440 x 215mm)

Thickness (mm)	100	215
Weight† (kg)	6.4	13.8

Properties

Mean compressive strength not less than 4.0N/mm²

Designed thermal conductivity (λ) 0.16W/mK

Specified gross dry density 660kg/m³

* Manufactured to special order only

† Block weights are calculated using specified gross dry density, with a moisture content of 3% by weight added to provide the equilibrium value.





Coursing Bricks

Detailing



Coursing Bricks are aerated blocks produced in standard brick sizes for use in bonding and infill to ensure that a uniform thermal performance is achieved throughout the wall.

- Protect against pattern staining
- Infill above doors and windows
- Coursing at floor and ceiling level
- Making up between joists
- Hi-Strength Coursing Bricks are also available for use in walls built of Hi-Strength 7, or Hi- Strength 10 blocks

Working dimensions

Face dimensions (mm) 215 x 65

Thicknesses

Thickness (mm)	100	115	125	130	140	150
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Note: Thermalite Coursing Bricks are suitable for use externally and internally, above or below dpc level in loadbearing or non-loadbearing applications.

Loadbearing walls should not be constructed with Thermalite Coursing Bricks as the sole masonry unit.

Additionally, standard Coursing Bricks should not be used in walls where the compressive strength requirement for the blockwork is in excess of 2.9N/mm².



Thin Joint Masonry



Thermalite Thin Joint Masonry is a fast, clean and accurate system of construction, designed to lower costs by reducing the time taken to build walls. An accepted 'Modern Method of Construction' (MMC), the thin joint system can achieve improvements on many different build programs and when used with aircrete blocks, the depth of mortar can be reduced from 10mm to 3mm, or less.



Thin layer mortar is a pre-mixed, cement-based product that only requires adding to water to make an easily applied mortar. It provides an alternative to traditional sand/cement mortar. All blocks in the standard Thermalite range can be produced with the required tolerances for use in walls constructed using thin layer mortar.



Thermalite blocks were first used in trials on thin joint construction in the 1980's but there is a far more extensive history of use in Continental Europe. The increasing demands of the UK construction industry mean that the benefits offered by thin joint masonry are becoming far more relevant.

Benefits

Faster build speed

The application of thin layer mortar to Thermalite blocks is achieved by the use of a serrated scoop, which allows mortar to be quickly and accurately applied to the bed joint of the wall. The full benefits can be realised on long runs of walling.

Independent speed trials, conducted by a leading Chartered Building Surveyor, have indicated that a wall of Thermalite blocks and thin layer mortar can be laid twice as fast as that built with aggregate blocks and general purpose mortar.

This speed of construction can be further enhanced when using Thermalite Large Format blocks, which have a face size equivalent to two traditional concrete blocks.



Increased productivity

Thin layer mortar is different to traditional mortar in that it sets far more rapidly. The same high levels of productivity are not achievable with masonry built using general purpose mortar, which requires more time to attain sufficient strength to support further construction, thus limiting the height that can be built in one day.

Typically, Thermalite blocks built with thin layer mortar will be stable after 60 minutes. This will allow the amount of walling that can be built to be increased and the earlier installation of other components, such as floors and roof timbers. The completion of a weathertight envelope allows brickwork to be taken off the critical path and for internal work, such as plastering, service installation and partitioning to progress.



Improved thermal performance

The thermal insulation requirements of the Building Regulations call for attention to be given to the effects of cold bridging. Consequently, when calculating U-values for walls, heat loss through mortar joints must be taken into consideration.

By reducing the amount of mortar in any given area of wall by at least 70%, compared to a traditional mortar joint, heat loss through the mortar joints is reduced. In a clear cavity construction, an improvement of up to 10% in U-values is possible.



Improved airtightness of construction

The airtightness test results for blockwork using Thermalite 100mm blockwork and thin layer mortar, as conducted by the Building Services Research and Information Association were better than $0.10\text{m}^3\text{hr}^{-1}\text{m}^{-2}$.

Reduced site wastage

The precision cutting of blocks for use with thin layer mortar allows greater utilisation, which can substantially reduce site wastage.

Thin Joint Masonry



Thin Layer Mortar

Thermalite Thin Layer Mortar is factory made and supplied as a dry, pre-mixed, bagged product. The use of mortar as part of the Thermalite Thin Joint system is certified by the BBA.

Bag Weight	25kg
Approximate coverage (100mm thick walling)	15m ²
Density	1800kg/m ³



Thin layer mortar should be stored in dry conditions. It is recommended that the mortar is used in temperatures at 5°C, or above. Working below these temperatures, down to -6°C, is possible, however, all building elements must be protected in accordance with codes of practice.

Note: In a thin joint masonry construction, the joints at maximum are only 3mm thick. Consequently, when blocks with a face size of 440 x 215mm are selected an additional 3.55% blocks will be required to complete a m² of walling.

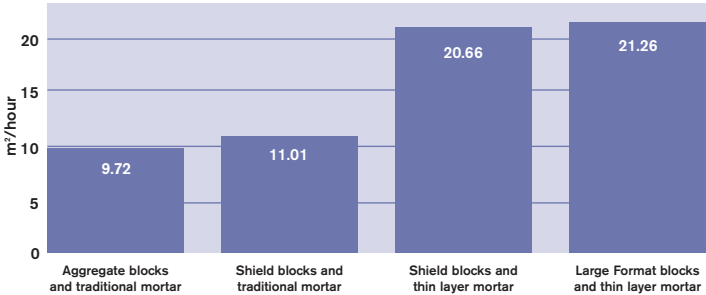
When Large Format blocks with a face size of 440 x 430mm are selected for use in thin joint walling, an additional 4.3% blocks will be required to complete a m² of walling.

Large Format Blocks

Thermalite Large Format blocks offer considerable productivity gains. They are produced with face dimensions of 440 x 430mm in a range of thickness. This is equivalent to two normal concrete blocks, or twelve bricks.

Independent tests by Percy Howes & Co. Chartered Surveyors have found that the use of Large Format blocks in thin joint construction can lead to at least a 50% time saving, compared to the use of aggregate blocks and general purpose mortar.

Rate of laying











What you need

Thermalite supplies the following thin joint masonry components:

- Mortar in 25kg bags.
- Hand held applicator scoops to suit block widths as below.

Colour of scoop	Block width (mm)	Colour of scoop	Block width (mm)
 Red	90,100	 Green	190, 200
 Yellow	115,125,130	 Black	215
 Blue	140,150	 White	265, 275

Ancillary components

Resulting from the increasing use of thin joint masonry there is a widening choice of suitable ancillary products. Many components are available through builders' merchants or specialist fixings suppliers, but can also be purchased direct from the manufacturer. When buying products for use with thin layer mortar, customers should ensure that they are fit for purpose and, preferably, supported by third party certification.

The Thermalite House

The Thermalite Thin Joint Masonry system, has been used to construct a detached house from a design made available by a national house builder. The main objective of this project was to demonstrate that the thin joint system could be safely used to construct the load bearing inner leaf of masonry up to roof plate level, without the stabilizing effect of the brickwork outer leaf, and to complete the process quickly and accurately. The inner leaf of this 3 bedroom detached house, including floor and roof truss installation was completed just 16 hours using a standard team of 2 block layers and one labourer.

This project resulted in the acceptance of this modern method of construction as one of the Housing Forum's Demonstration Projects, on a site in conjunction with Gleeson Homes (North East), and proved that the thin joint masonry system can significantly increase speed and efficiency of construction, reduce wastage on site, and improve energy ratings.



Performance



Fire resistance

All Thermalite products provide excellent fire protection. They are classified as A1, non-combustible in accordance with BS EN 771-4.

Loadbearing

Thermalite blocks with a thickness of 90mm or more may be used in the construction of loadbearing walls. Where the loading conditions require a 7.3N/mm^2 or 10.4N/mm^2 block, Thermalite Hi-Strength 7 or 10 may be used.



Sound insulation

Hanson offers a range of solutions to achieve the performance standards of Building Regulation Part E. In adoption of these solutions, pre-completion testing (PCT) will be necessary to prove compliance. As an alternative to PCT, the use of Robust Details* will also demonstrate compliance.



There are currently 2 Robust Details for aircrete separating walls, referenced E-WM-6 (general purpose mortar) and E-WM-10 (thin layer mortar). Aircrete blocks can also be used for flanking walls to Robust Detail E-FC-4 separating floor. Thermalite Shield, Party Wall, and Hi-Strength products can be used in all of these Robust Details.

Moisture penetration

All Thermalite products, because of their closed cell structure, provide good resistance to the passage of moisture. Independent tests have indicated that Thermalite blocks make water penetration extremely difficult.

Walls which contain an insulating material with the capacity to store heat, such as Thermalite blocks, can help reduce condensation, because the temperature drop across the wall is gradual.

*For further details, please refer to www.robustdetails.com



Frost resistance

Thermalite blocks offer superior protection against the effects of frost. Tests involving continuous freeze-thaw cycles have confirmed that Thermalite products have the necessary resistance, and suffer no reduction in strength under these conditions.

Wall ties

Wall ties should be of Building Regulation Part E, Type A for separating and flanking walls; and Type B for where a Type A tie is not suitable.

Movement joints

In common with all cement based products, Thermalite walls are subject to movement as the walls dry out. Movement joints should be located at 6 metre centres, although this may vary depending on the building layout.

As advised in BS 5628: Part 3 movement joints may not be necessary in the internal walls of dwellings, subject to the size of the dwelling, although bed joint reinforcement may be recommended in specific situations.

Workability

All Thermalite products can be easily cut, sawn, chased and worked accurately with ordinary hand tools. A straight cut ensures less wastage, reducing the need to make good.

Fixings

The majority of general purpose fixings give excellent performance in Thermalite. Examples of such fixings are as follows;

- Cut nails, with a minimum penetration of 50mm
- Wood screws - No. 12 or 14 screws fixed directly into Shield or Hi-Strength 7 with a minimum penetration of 50mm
- Plastic or fibre plugs for screws into a pre-drilled hole

Certain structural situations may require the use of special fixing methods such as a spiral plug, grouted fixing, spiral nail or 'sleeved' nail.





Mortar requirements

Selection of a suitable mortar is important to ensure that the composition is compatible in relation to the blocks being used. The following recommendations for general purpose mortar with Thermalite take this into account and are based on the requirements of BS 5628: Part 3.

For information on thin layer mortar please see page 20.

Above dpc (externally and internally)		Below dpc	
1 : 1 : 6	cement : lime : sand by volume	1 : 4	cement : sand by volume
1 : 6	cement : sand by volume with a plasticiser	1 : 1/2 : 4	cement : lime : sand by volume
1 : 5	masonry cement : sand by volume		

Below dpc sulphate resisting cement may be required, depending on ground and ground water conditions.

Finishes

Thermalite blocks provide an excellent background for the use of internal and external finishes to walls.

Although the scratch finish is primarily an identification characteristic, it helps provide a key and should be augmented by recessing the mortar joint, to assist during the application of direct finishes. It is also possible to apply render to Thermalite Paint Grade Smooth blocks.

Blockwork should be allowed to dry out thoroughly before rendering or plastering, in accordance with relevant codes of practice.

External rendering

The finishes suitable for external rendering onto Thermalite blocks are classified by BS 5262 as follows:

- Float finish
- Scraped or textured, hand applied



- Dry-dash, dry-thrown by hand
- Machine applied, Tyrolean or power spray

The rate of drying will vary with conditions of temperature, humidity and ventilation. If necessary, precautions should be taken to retain sufficient moisture throughout curing.

Plaster finishes

The following plaster undercoats are recommended:

- 1 : 1 : 6 cement : lime : sand by volume
- Pre-mixed Gypsum-bound or cement-lime bound lightweight aggregate

The undercoats may be plaster finished with neat gypsum Class B finish coat, or with a lightweight pre-mixed gypsum, or gypsum lime bound coat. Machine projected plasters may be suitable for use on Thermalite walls.

Dry lining

The following systems are suitable for use on Thermalite blocks:

- Plaster dab method
- Timber batten method
- Metal framing systems

Painting direct

Paint Grade Smooth blocks built fair-faced are particularly suitable for the direct application of paint (with most types of paint) using a brush, roller or spray gun.

Tiling*

Thermalite is ideal for external tile-hanging because it readily accepts fixing direct by cut nails and screws. Thermalite blocks also provide a suitable background for the application of ceramic wall tiles. Proprietary adhesives should be used to fix ceramic tiles to rendered, plastered and unrendered Thermalite walls.

*For further details, please contact our Product Services Department.



Thermal insulation



Introduction

The thermal performance of the building fabric is becoming increasingly reliant upon the considered combination of structural components, specialist insulation products, finishes and workmanship. The high level of thermal performance of Thermalite blocks, coupled with excellent thermal mass qualities and inherent air tightness, ensures that cost effective solutions can be achieved to satisfy building regulations. The tables below and opposite show some of the solutions available using Thermalite products.

Block-Cavity-Block solutions

A cavity wall constructed with a rendered Thermalite outer leaf, as an alternative to brick, will offer significantly improved U-values. Improvements of 0.02 to 0.05 can be achieved dependent on the level of performance necessary.

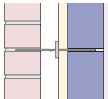
Thin Joint Solutions

The use of thin layer mortar in place of general purpose mortar can offer significantly improved U-values of 0.02 to 0.04 dependent on the level of performance necessary. An improvement in air tightness is also probable.

Examples of Thermalite solutions to meet Part L Requirements

Table 1- Partially filled cavity

Using insulation type: PIR - Polyisocyanurate/Celotex/Kingspan/Xtratherm 0.023W/m.K
General purpose mortar joints (10mm), brick outer leaf



Insulation thickness	Turbo		Shield		Hi-Strength 7		Finish
	100mm	150mm	100mm	150mm	100mm	150mm	
35mm	0.30	0.27	-	0.29	-	0.30	12.5mm plasterboard on dabs
40mm	0.28	0.25	0.29	0.27	0.30	0.28	12.5mm plasterboard on dabs
45mm	0.26	0.24	0.27	0.25	0.28	0.27	12.5mm plasterboard on dabs
50mm	0.25	0.23	0.26	0.24	0.27	0.25	12.5mm plasterboard on dabs
35mm	-	0.28	-	0.30	-	-	13mm light weight plaster
40mm	0.29	0.26	0.30	0.28	-	0.29	13mm light weight plaster
45mm	0.27	0.25	0.28	0.26	0.29	0.27	13mm light weight plaster
50mm	0.26	0.23	0.27	0.25	0.27	0.26	13mm light weight plaster

Please note that this table assumes a resistance figure of 0.64m².K/W for the clear cavity space of no smaller than 25mm.



Table 2 - Fully filled cavity

Using insulation type: mineral wool 0.037W/m.K
General purpose mortar joints (10mm), brick outer leaf

Insulation thickness	Turbo		Shield		Hi-Strength 7		Finish
	100mm	150mm	100mm	150mm	100mm	150mm	
75mm	-	0.28	-	0.30	-	-	12.5mm plasterboard on dabs
80mm	0.30	0.27	-	0.29	-	0.30	12.5mm plasterboard on dabs
85mm	0.29	0.26	0.30	0.28	-	0.29	12.5mm plasterboard on dabs
90mm	0.28	0.25	0.29	0.27	0.30	0.28	12.5mm plasterboard on dabs
100mm	0.26	0.23	0.27	0.25	0.28	0.26	12.5mm plasterboard on dabs
75mm	-	0.29	-	-	-	-	13mm light weight plaster
80mm	-	0.28	-	0.30	-	-	13mm light weight plaster
85mm	0.29	0.27	-	0.28	-	0.30	13mm light weight plaster
90mm	0.28	0.26	0.30	0.27	-	0.29	13mm light weight plaster
100mm	0.26	0.24	0.27	0.26	0.28	0.27	13mm light weight plaster

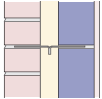
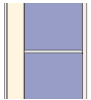


Table 3 - Solid wall

General purpose mortar joints (10mm)

External finish	Turbo			Shield		Hi-Strength 7		Internal finish
	215mm	265mm	300mm	190mm	200mm	200mm	215mm	
20mm render	-	-	0.29	-	-	-	-	40mm Gyproc Thermaline Plus
	-	0.30	0.28	-	-	-	-	45mm Gyproc Thermaline Plus
	0.30	0.27	0.26	-	-	-	-	55mm Gyproc Thermaline Plus
	0.28	0.26	0.24	-	-	-	-	50mm Gyproc Thermaline Super
	0.24	0.23	0.21	0.28	0.27	0.29	0.28	60mm Gyproc Thermaline Super
	0.23	0.21	0.20	0.26	0.26	0.27	0.27	65mm Gyproc Thermaline Super



Thermal insulation

Avoidance of risks

Increasing the air-tightness of buildings and improving energy conservation measures, including fabric insulation, could entail increased risk of condensation and technical problems. It is, therefore, of paramount importance that the solutions chosen have been widely tried and tested in the built environment. Thermalite's moisture resistance and thermal insulation properties, combined with its excellent fire resistance, sound insulation, light weight and strength properties, all contribute towards ensuring a risk-free solution.

Energy rating - SAP

New measures to make all buildings more energy efficient are reflected in new regulations applying from April 2006. For new dwellings, there is only a single route to compliance, by limiting the carbon output of the dwelling. Calculations must be made using an energy rating system called SAP 2005, which takes account of the building fabric and its services, such as heating, lighting and ventilation. For extensions, simpler alternative routes to compliance are available subject to size and design.

For non-domestic buildings, a similar process applies, but the energy performance calculations required, are made using SBEM, rather than SAP 2005.

Hanson and the environment



At Hanson, we recognise the impact that we can have on the environment, so we manage all activities to maximise our contribution towards the protection of the environment and the preservation of natural resources.

Hanson and the environment

Reduction, re-use and recycling are the only really green solutions to the environmental impact of waste, so wherever possible, recycled materials are used in the manufacture of our products, thereby reducing the use of primary aggregates. In fact, Hanson offers the most environmentally friendly aircrete products in the UK, made from up to 80% recycled materials.

Over half the material used in Thermalite blocks is pulverised fuel ash (pfa), a by-product from coal burning power stations which is both stable and environmentally friendly. A strict waste minimisation scheme is operated during manufacture and all waste from the process that is not crushed and recycled is used either in other concrete products, or as an aggregate bulk fill replacement in road construction.

Energy Saving

The micro-cellular structure of Thermalite offers remarkably high thermal insulation and thus lowers energy consumption for the heating of buildings. Thermalite blocks are made to high dimensional tolerances and can be easily and accurately cut to reduce waste on site.

Hanson also operates a modern transport fleet, which when combined with the lightweight Thermalite product ensures that energy consumption during haulage is minimised.

Thermalite blocks are also available in void packaging, which eliminates the need for pallets – helping to reduce packaging waste obligations.

Consequently, the use of Thermalite blocks can significantly reduce energy consumption and environmental damage, compared with other building materials.

...building a sustainable future

Environmental Accreditation

Hanson is proud to be the first aircrete block manufacturer to be awarded the coveted environmental manufacturing standard, BS EN ISO 14001, for its Thermalite manufacturing locations.

The key aspect of this standard is to continually improve environmental performance on a sustained basis, by the setting of site objectives and targets to drive improvement:

- Annual improvement targets on waste minimisation and energy efficiency
- Working closely with suppliers; 'greening the supply chain'
- Consideration of neighbours; landscaping and tree planting at sites

The BRE (Building Research Establishment) has developed Ecopoints to allow a wide range of environmental impacts (e.g. energy use and mineral extraction) to be compared using the same measure. The lower the Ecopoints score, the lower the environmental impact. Thermalite products have achieved a very low annual Ecopoint rating of 1.93 per tonne of product; the annual impact of a typical UK citizen scores 100.

The low environmental impact of Thermalite products also results in the achievement of an 'A' status as part of the EcoHomes rating.





The Green Guide to Specification

The 'Green Guide to Specification' contains tables showing the summary ratings, measured in Ecopoints per m² for all the elements included in the Green Guide. The information below, shows the Green Guide ratings for external walls where the Thermalite products receive an 'A' rating.

Green Guide Wall Elements	Ecopoints/m ²	Ecopoints rating
1 square metre over 60 year life: external wall: cavity wall construction: brickwork, 65mm rock wool cavity wall insulation, 100mm Thermalite Turbo blockwork, plasterboard internal face	0.98	A
1 square metre over 60 year life: external wall: cavity wall construction: brickwork, 65mm rock wool cavity wall insulation, 115mm Thermalite Turbo blockwork, plasterboard internal face	1.0	A
1 square metre over 60 year life: external wall: solid wall construction: rendered, 365mm Thermalite Turbo blockwork, plasterboard internal face	0.98	A
1 square metre over 60 year life: external wall: cavity wall construction: brickwork, 65mm rock wool cavity wall insulation, 100mm Thermalite Shield blockwork, plasterboard internal face	1.0	A
1 square metre over 60 year life: external wall: cavity wall construction: brickwork, 75mm rock wool cavity wall insulation, 100mm Thermalite Shield blockwork, plasterboard internal face	1.0	A
1 square metre over 60 year life: external wall: wall construction: 12.5mm plasterboard on dabs, 7mm nominal parge cement-based render, 100mm Thermalite Shield , 75mm clear cavity, 100mm Thermalite Shield , 7mm nominal parge cement-based render & 12.5mm plasterboard on dabs	0.66	A
1 square metre over 60 year life: external wall: cavity wall construction: brickwork, 75mm rock wool cavity wall insulation, 100mm Thermalite Hi-Strength 7 blockwork, plasterboard internal face	1.1	A

Applying the Green Guide to Specification

Whilst all specification choices are important, designers may wish to pay particular attention to the selection for the building elements which have the potential for the least environmental impact.

Hanson's Environmental Policy

Managing environmental issues is an integral part of our business strategy. We endeavour to achieve a high standard of environmental performance and to make a positive contribution to society through our products and land management programmes. Our policy is to:

- Comply with environmental legislation, regulations and other codes of practice adopted by the company (such as industry initiatives) and plan ahead for future requirements
- Monitor, evaluate and continuously improve environmental performance through the adoption of environmental management systems
- Respond to the needs and concerns of local communities
- Strive towards sustainability, balancing today's needs with those of the future
- Improve employee awareness of environmental issues and encourage the sharing of experience and expertise within our business
- Minimise adverse environmental impacts of the company's activities
- Conserve resources and minimise the generation of waste
- Make appropriate resources and training available to implement the policy

‘The use of aerated blocks, which are lightweight and provide insulation, improves environmental performance.’

CDM Regulations

Construction is one of Britain's most hazardous industries with back pain cited as the single biggest cause of ill health.

The HSE maintain a policy to improve health and safety standards during construction work. This includes site visits to ensure the safe use of manual handling techniques.

The CDM Regulations place responsibility on all individuals who can contribute to health and safety on a construction project.

What are the guidelines?

The Construction Industry Advisory Committee (CONIAC) advises that the handling of heavy building blocks can result in a wide range of injuries where the damage is gradual and progressive over a substantial period of time.

After taking account of expert opinion, CONIAC has concluded that there is a high risk of injury in the single-handed, repetitive manual handling of blocks heavier than 20kg.

The Thermalite Solution

The Thermalite micro-cellular structure results in a product range which is both strong and exceptionally light to handle. Consequently, all of our standard size blocks weigh less than 20kg in accordance with guidelines.

- **Handholds** - HSE also recommends that blocks with handholds should be selected wherever possible. Hanson is the first block manufacturer in the UK to offer handholds, which have been introduced to the Thermalite Trenchblock range, to aid the process of lifting and laying foundations, making building with Thermalite blocks not only faster, but safer too.
- **Large Format Products** - Large Format blocks, the equivalent of at least two normal blocks, are a proven solution to the demands of builders to increase productivity on site. Due to their cellular structure they are also available in a weight less than 20kg, enabling compliance with CDM regulations.

Product Identification



All Thermalite blocks are produced with scratch marks to identify the different range of densities in which they are produced. Please find below a guide to the product range.



Turbo: 6 scratch marks



Shield: 4 pairs of scratch marks



Hi-Strength 7 and
Hi-Strength Trenchblock: 4 scratch marks



Hi-Strength 10: 2 scratch marks



Paint Grade Smooth/Hi-Strength Paint Grade
Smooth: 0 scratch marks



Trenchblock/ Tongue & Groove: 4 pairs of scratch marks



Floorblock: 9 scratch marks



Party Wall: 9 scratch marks

Hanson - a global business

Hanson is one of the world's largest suppliers of heavy building materials to the construction industry. We produce aggregates (crushed rock, sand and gravel), ready-mixed and precast concrete, asphalt and cement-related materials and a range of building products including concrete pipes, concrete pavers, tiles and clay bricks

We are part of the HeidelbergCement Group, which employs 70,000 people across five continents and has leading positions in concrete and heavy building products, and is the global leader in aggregates.

Hanson Building Products is the UK's largest brick and aircrete block producer. We also produce aggregate blocks, bagged aggregate and cement products, renders, pavers, precast floors and stairs, SUD systems and prefabricated building systems. The division incorporates London Brick, Thermalite, Red Bank, Cradley, Formpave and Structherm.



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