



**THERMALITE**®

Building on our promise to the environment.

# Achieving the Code with Thermalite

Changes to the Code for Sustainable Homes were introduced in October 2010. This guide explains how, by using Thermalite aircrete blocks, you can achieve all levels of the Code.

## Key benefits

### Energy

- External wall U-values for Code Levels 3–6 are easily achieved.
- Thermal bridging can be reduced using Thermalite Enhanced Construction Details.
  - Cost-effective.
  - Simple construction.
  - Enhanced Y and  $\psi$  values = reduced carbon dioxide (CO<sub>2</sub>) emissions.
- Thermal mass helps prevent overheating in the summer and stabilises temperatures.
- Impressive air permeability figures help to achieve or better the design value.
- Zero heat loss from party walls in SAP2009 when using Thermalite Robust Detail separating walls.

### Materials

- BES 6001 certified – responsible sourcing rating of very good = tier level 1 (highest).
- Achieves A+ Green Guide ratings for external walls.
- Superior Green Guide ratings to generic aircrete separating walls – up to A rating.

### Health and well-being

- 1–3 credits for sound insulation when using Thermalite Robust Detail separating walls.

“Thermalite aircrete blocks are a sustainable building material that can help designers and specifiers meet all levels of the Code for Sustainable Homes. So whatever the U-value imposed, Thermalite has a cost-effective solution.”

Chris Hornby – Head of Product Services



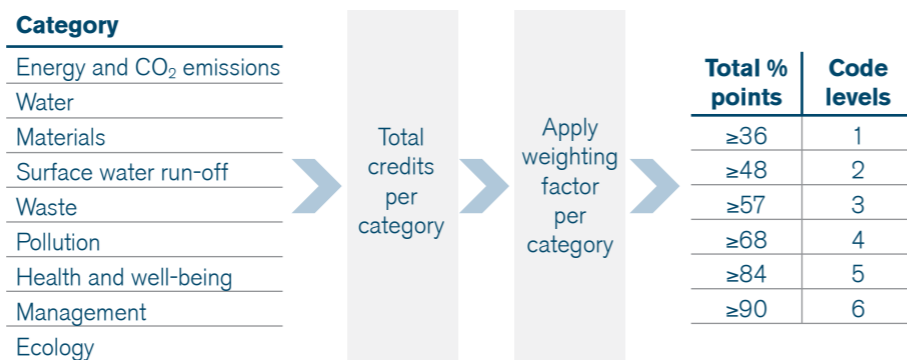
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The Government introduced the Code for Sustainable Homes (the Code) in 2007, and it was subsequently revised in October 2010. The Code was published to drive a step-change in sustainable home building practice. It is a rating system for the environmental sustainability of new homes.

New homes are assessed against nine criteria and are awarded a score ranging from Level 1 (lowest) to Level 6 (highest).

## How the Code is calculated



## Mandatory performance standards

There are minimum standards that have to be met at every level of the Code, for the categories energy, water, materials, surface water run off and waste. There are no minimum standards for pollution, management and ecology.

## Weighting factors

The categories are weighted according to their environmental impact and this is taken into account when the credits are converted to percentage points to determine the Code Level achieved.

Category	Credits available	Weighting factor (% points contribution)	Points score for each credit in category
Energy and CO <sub>2</sub> emissions	31	36.4	1.17
Health and well-being	12	14.0	1.17
Ecology	9	12.0	1.33
Management	9	10.0	1.11
Water	6	9.0	1.50
Materials	24	7.2	0.30
Waste	8	6.4	0.80
Pollution	4	2.8	0.70
Surface water run-off	4	2.2	0.55

## Application of the Code

- Code Level 3 is now required for all new housing.
- Social Housing has to be built to Code Level 4.

**Thermalitefact:**  
Thermalite aircrete blocks can offer a cost-effective solution to meet all levels of the Code.

The following tables give a brief explanation of how credits are gained.

In categories where Thermalite helps to gain credits, all the sub-sections are shown and areas that are applicable to Thermalite are highlighted.

Category 1 – Energy and carbon dioxide emissions				
Issues	Credits available	Weighted % of final score	How credits are gained	
Thermalite contributes to the Code	<b>Ene 1 Dwelling Emission Rate (DER)</b> To limit CO <sub>2</sub> emissions arising from the operation of a dwelling and its services in line with current policy on the future direction of regulations.	10	11.7	Credits awarded based on the % improvement in the DER over the Target Emission Rate (TER) <b>Mandatory elements:</b> Specific % improvement of DER over TER for Code Levels 4–6.
	<b>Ene 2 Fabric energy efficiency</b> To improve fabric energy efficiency performance, thus future-proofing reductions in CO <sub>2</sub> for the life of the dwelling.	9	10.53	3–9 credits awarded based upon fabric energy efficiency value from SAP (kWh/m <sup>2</sup> /year) Note - varies with dwelling type.
	<b>Ene 3 Energy display devices</b> To promote the specification of equipment to display energy consumption data, thus empowering dwelling occupants to reduce energy use.	2	2.34	Current electricity <b>OR</b> primary heating fuel consumption data are displayed to occupants (1 credit). Current electricity <b>AND</b> primary heating fuel consumption data are displayed to occupants (2 credits).
	<b>Ene 4 Drying space</b> Provide a reduced energy means of drying clothes.	1	1.17	Provide secure space with fittings for drying clothes (1 credit), e.g. internal drying line over a bath or external rotary dryer.
	<b>Ene 5 Energy labelled white goods</b> To promote the provision or purchase of energy-efficient white goods, thus reducing CO <sub>2</sub> emissions.	2	2.34	Information on energy-efficient white goods provided (1 credit). Energy-efficient white goods provided (2 credits).
	<b>Ene 6 External lighting</b> Encourage the provision of energy-efficient external lighting, thus reducing CO <sub>2</sub> emissions.	2	2.34	Energy-efficient external lighting provided (2 credits).
	<b>Ene 7 Low and zero carbon technologies</b> Reduce CO <sub>2</sub> emissions by encouraging local energy generation from renewable sources to supply a significant part of the energy demand.	2	2.34	Credits awarded based on the % reduction in CO <sub>2</sub> emissions achieved. –10% reduction (1 credit) –15% reduction (2 credits)
	<b>Ene 8 Cycle storage</b> Encourage the use of bicycles as transport by providing adequate and secure storage facilities.	2	2.34	Suitably sized, secure storage areas provided.
	<b>Ene 9 Home office</b> Reduce the need to commute to work by providing residents with the necessary space and services to be able to work from home.	1	1.17	Provide suitable home office.
<b>Total</b>	<b>31</b>	<b>36.4</b>		

Category 2 – Water			
Issues	Credits available	Weighted % of final score	How credits are gained
<b>Indoor and external water use</b>	6	9	Credits are awarded based upon the efficiency of water fittings. <b>Mandatory elements:</b> minimum performance requirements for each level of the Code.

Category 3 – Materials			
<b>Mat 1 Environmental impact of materials</b> Encourage the use of materials with lower environmental impacts over their life cycle.	15	4.5	<b>Mandatory element:</b> At least three of the following to have Green Guide ratings of A+ to D: roof, external walls, internal walls, upper/ground floors, windows. Credits are awarded based on the Green Guide rating for the element, with ratings of A+ to E scoring from 3 credits to 0 respectively.
<b>Mat 2 Responsible sourcing of materials – basic building elements</b> Encourage the specification of responsibly sourced materials for the basic building elements.	6	1.8	80% of the assessed materials in the following elements must be responsibly sourced: frame, ground floor, upper floors, roof, external walls, internal walls, foundations, staircases. Points are scored dependent upon the certification scheme used to demonstrate responsible sourcing for a specific material. These schemes are graded and range from Tier 1 (highest) to Tier 4 (lowest). Volumes and tier levels are fed into the Calculator Tool which converts the score to credits.
<b>Mat 3 Responsible sourcing of materials – finishing elements</b> Encourage the specification of responsibly sourced materials for the finishing elements.	3	0.9	80% of the assessed materials in the following elements must be responsibly sourced: staircase, window, external and internal doors, skirting, panelling, furniture, fascias. Points are scored dependent upon the certification scheme used to demonstrate responsible sourcing for a specific material. These schemes are graded and range from tier 1 (highest) to tier 4 (lowest). Volumes and tier levels are fed into the Calculator Tool which converts the score to credits.
<b>Total</b>	<b>24</b>	<b>7.2</b>	

Category 4 – Surface water run-off			
<b>Management of surface water run-off from developments and flood risks</b>	4	2.2	Use Sustainable Urban Drainage Systems (SUDS). SUDS include permeable paving, holding ponds etc. Build in a low-risk area or where the finished ground floor level will be above the flood level.

Category 5 – Waste			
<b>Storage of household waste, site waste management and composting</b>	8	6.4	<b>Mandatory elements:</b> Minimum space allocated for waste storage. A site waste management plan must be developed and implemented. Provide composting facilities.

Thermalite contributes to the Code

Category 6 – Pollution			
Issues	Credits available	Weighted % of final score	How credits are gained
<b>Global Warming Potential (GWP) of insulants and nitrogen oxide (NO<sub>x</sub>) emissions</b>	4	2.8	Use insulating materials with GWP <5. Credits awarded based on boiler class or systems which do not produce NO <sub>x</sub> .

Category 7 – Health and well-being			
<b>Hea 1 Daylighting</b> Improve the quality of life through good daylighting and reduce the need for energy to light the home.	3	2.8	Provision of good daylighting.
<b>Hea 2 Sound insulation</b> Provision of improved sound insulation to reduce the likelihood of noise complaints from neighbours.	4	4.7	Use Robust Details with credits or prove that the required sound insulation has been achieved through sound insulation testing.
<b>Hea 3 Private space</b> Improve quality of life by providing an outdoor space which is at least partially private.	1	1.1	Provision of outdoor space e.g. garden of suitable size.
<b>Hea 4 Lifetime Homes</b> Encourage the construction of homes that are accessible and easily adaptable to meet the changing needs of current and future occupants.	4	4.7	Lifetime Homes criteria to be met, e.g. car parking space of minimum size, level/gently sloping surfaces to entrances, well lit access areas, minimum widths for doorways, walls capable of taking handrails, etc. <b>Mandatory element:</b> Lifetime Homes criteria to be met at Code Level 6.
<b>Total</b>	<b>12</b>	<b>14.0</b>	

Thermalite contributes to the Code

Category 8 – Management			
<b>Home User Guide, Considerate Constructors Scheme, construction site impacts and security</b>	9	10	Home User Guide provided with information on site and surroundings. Manage site in environmentally and socially aware manner. Monitor and report on CO <sub>2</sub> production, energy use, water consumption, dust, ground/surface water pollution and responsibly sourced timber. Adopt security recommendations from local police.

Category 9 – Ecology			
<b>Ecological value of site, ecological enhancement, protection of ecological features, change in ecological value of site and building footprint</b>	9	12	Land is of low ecological value/any land of value within the development will remain undisturbed. Developer adopts recommendations from a qualified ecologist. Site has no ecological value or features are adequately protected. Ecological value is measured before and after development. Building design makes good use of land available. (e.g. smaller footprint by using three floors).

To meet the requirements of the Building Regulations, the DER must be no worse than the TER. The Code sets out higher standards for the energy performance for dwellings, and credits are awarded based on the percentage improvement in the DER over the TER.

**Dwelling Emission Rate –**

Estimated CO<sub>2</sub> emissions (kg/m<sup>2</sup>) per year from energy use (heating, hot water and lighting) for the actual dwelling.

**Target Emission Rate –**

The minimum performance standard for CO<sub>2</sub> emissions permitted by the Building Regulations, derived from a notional building of the same size and shape as the actual dwelling.



Criteria	% Improvement 2010 DER/TER*	Credits**	Mandatory requirements
≥ 8		1	
≥ 16		2	
≥ 25		3	Level 4
≥ 36		4	
≥ 47		5	
≥ 59		6	
≥ 72		7	
≥ 85		8	
≥ 100		9	Level 5
Zero net CO <sub>2</sub> emissions		10	Level 6
Default cases			
None			

\* Performance requirements are equivalent to those in previous scheme versions but are now measured using Approved Document L1A 2010 TER as the baseline.

\*\* Up to nine credits are awarded on a sliding scale. The scale is based on increments of 0.1 credits, distributed equally between the benchmarks defined in this table.

The percent improvement is calculated using Standard Assessment Procedure software (SAP 2009).

**Thermalitefact:**  
Thermalite aircrete blocks can improve the fabric performance of a building under SAP 2009.

**Energy Saving Trust solutions**

The Energy Saving Trust (EST) has produced guidance for achieving the required improvement of DER/TER for Code Levels 3, 4, 5 and 6. These can be found at: [www.energysavingtrust.org.uk](http://www.energysavingtrust.org.uk)

**U-values**

There are many ways of achieving the required improvement because there is a multitude of options in terms of materials and renewables available as well as site-specific aspects such as orientation of the building. However, the work carried out by EST acts as a starting point and gives design U-values as follows:

Code level	Building element	Energy Saving Trust solution
3	Roof	0.13
	Walls	0.25
	Exposed floors	0.20
4	Roof	0.13
	Walls	0.20
	Exposed floors	0.20
5 and 6	Roof	0.13
	Walls	0.15
	Exposed floors	0.15

**Thermalitefact:**  
Thermalite aircrete blocks can achieve code level 3, with cost effective 100mm cavity wall solutions, whilst retaining a 300mm wall footprint.

Based on these, Thermalite can easily provide the required U-values, solutions as follows:

**Thermalite partial fill examples**

Minimum thickness of insulation required to achieve U-values stated (mm)														
Thermalite product	Brick, 50mm clear cavity, Polyurethane board with foil facing, minimum k-value = 0.022, Thermalite block, plasterboard on dabs.	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.22	0.23	0.24	0.25	0.26	0.27
Turbo	0.11	117	98	90	83	74	68	63	58	54	50	47	43	40
Shield	0.15	121	110	94	86	80	72	67	62	58	54	50	47	44
Hi-Strength 7	0.18	123	112	96	88	82	74	69	64	60	56	52	49	46

**Thermalite full fill examples**

Minimum thickness of insulation required to achieve U-values stated (mm)														
Thermalite product	Brick, insulation batt, minimum k-value = 0.032, Thermalite block, plasterboard on dabs.	0.15	0.16	0.17	0.18	0.19	0.20	0.21	0.22	0.23	0.24	0.25	0.26	0.27
Turbo	0.11	190	175	162	140	131	119	112	105	99	93	88	83	79
Shield	0.15	196	181	167	146	136	125	117	111	104	99	93	89	84
Hi-Strength 7	0.18	199	183	170	149	139	130	120	113	107	101	96	91	87

All ties based on Ancon stainless steel ties, thinner sections of insulation would be possible with a basalt-based Teplow tie.

■ EST solution for Code Level 3  
 ■ EST solution for Code Level 4  
 ■ EST solution for Code Levels 5 and 6

**Thermal bridging**

Thermal bridging is where heat loss occurs through the junction of building elements such as walls and floors where the continuity of the insulation is interrupted. These heat losses may be significant, but can be reduced by adopting accredited construction details (ACDs).

The ACD document produced by the government and the EST focuses on insulation continuity and airtightness, and gives guidance to the builder on how to demonstrate that provision has been made to eliminate thermal bridges in the insulation layers.

The use of ACDs means that  $\psi$  (Psi) values from Appendix K of SAP 2009 can be used, giving an equivalent  $y$ -value of 0.08 instead of the default  $y$ -value of 0.15 that would otherwise be used. This effectively halves the heat loss from thermal bridges.

The Aircrete Products Association (APA) instructed the Building Research Establishment (BRE) to undertake an examination of the use of aircrete with ACDs. This work has proved that thermal bridges are reduced even further when aircrete is used.

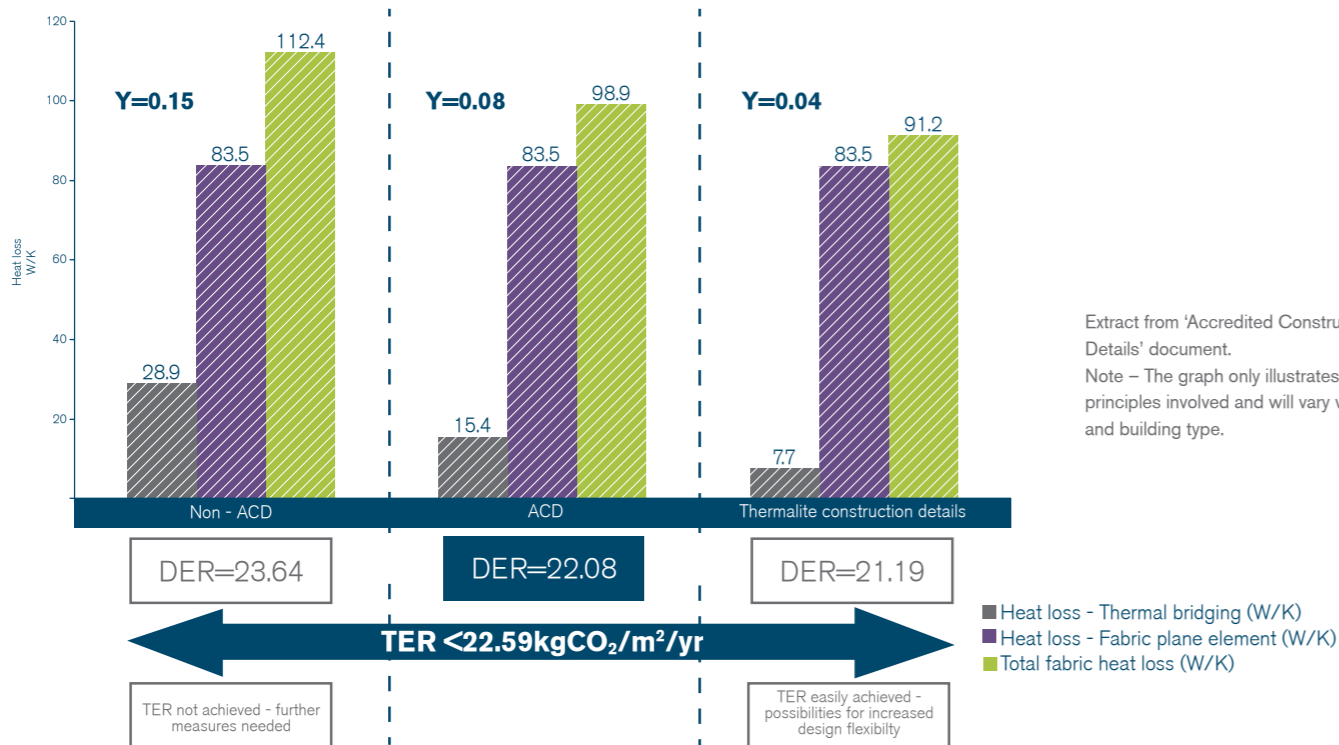
The use of these enhanced construction details (ECDs), plus all remaining details conforming to at least ACDs, means that greatly reduced  $\psi$  values can be used instead of those given for ACDs, giving an equivalent  $y$ -value of 0.04, effectively halving the heat losses again.

For further information on ECDs using Thermalite aircrete blocks, contact our Product Services Department on: 08705 258258.

**Thermalitefact:**

Using Thermalite enhanced construction details gives a 10–15% improvement in CO<sub>2</sub> emissions, dependent on the house type.

Effect of detail standards on heat loss



Extract from 'Accredited Construction Details' document.  
Note – The graph only illustrates the principles involved and will vary with design and building type.

**Renewables**

It is possible to meet Code Level 3 just through improvements to the building fabric. For Code Level 4 and above, renewables will be required, in the majority of cases, to achieve the % improvement of DER/TER.

**Thermal mass**

Thermal mass is the ability of a material to store heat. Thermal mass enables buildings to absorb and release heat to respond naturally to weather conditions, stabilising the internal temperature. During summer, thermal mass helps to prevent overheating and reduces the need for air-conditioning. In winter, heat is absorbed during the day and released during the night, thus supplementing the heating of the building.

Thermal mass is taken into account in the summer overheating calculation in SAP 2005. SAP 2009 takes things a step further by using thermal mass in the heating and cooling calculation. Thermalite provides a 'medium' level of thermal mass and so is well placed to stabilise temperatures within the building and also help to prevent overheating.

Hanson has proven the use of Thermalite in the EcoHouse™, its Code Level 4 house at the BRE Innovation Park. Thermalite was used in the external walls as part of Hanson's Quickbuild™ system.

Details of this project can be viewed at: [www.hanson.com/uk](http://www.hanson.com/uk)



EcoHouse™ – The BRE Innovation Park

**Party wall bypass**

SAP2005 assumed no heat loss through the party wall bypass affect, but in SAP2009, U-values are assigned based on the construction of the party wall.

Thermalite Robust Details E-WM-6, E-WM-10 and E-WM-13 (HEA 2 – sound insulation Pg14) now have the option to use Saint Gobain RD Party Wall Roll within the cavity of the separating wall. When this is used in conjunction with effective edge sealing, heat loss through the separating wall can be eliminated.



Construction	U-value
Solid wall	0.0
Unfilled cavity with no effective edge sealing	0.5
Unfilled cavity with effective edge sealing	0.2
Fully filled cavity with effective edge sealing	0.0

The materials that make up the party wall do not have any effect on the U-value assigned.

**Thermalitefact:**

Thermalite Shield can offer a one-block solution to meet party wall and prevent the wrong block being built into the party wall.

Credits are awarded based upon the fabric energy efficiency of the building (kWh/m<sup>2</sup>/year). This relates to the heat loss through the building fabric and is affected by the external surface area of the building, the U-values of the building elements, thermal bridging heat loss and the air permeability of the building envelope.

**U-values and thermal bridging**

(For details, see Ene 1 – Energy and CO<sub>2</sub> emissions, page 8)

**Air permeability**

Air permeability or air leakage is the uncontrolled flow of air through gaps and cracks in a building. Too much air leakage leads to unnecessary heat loss and an increase in CO<sub>2</sub> emissions.

Approved Document L1A 'Conservation of fuel and power in new dwellings' states that the worst allowable design air permeability is 10m<sup>3</sup>/(h.m<sup>2</sup>) @ 50 Pa. In order to achieve the required percentage improvement of DER/TER, the design air permeability figure can be set lower. This design value is then subject to confirmation by air permeability pressure testing once the building is completed.

**Effect of Thermalite on air permeability**

Thermalite blocks have a microcrystalline cellular structure that is highly resistant to the passage of air; its impressive performance levels are confirmed by independent tests by BSRIA.



**BSRIA air permeability test results**

**Report 15055A/1**

	Air permeability m <sup>3</sup> /(h.m <sup>2</sup> )
100mm Thermalite Shield blocks with acrylic sealed joints	<0.10
100mm Thermalite Shield with thin layer mortar	<0.10

**Report 15919A**

100mm Thermalite Turbo blocks with acrylic sealed mortar joints	0.18
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**Report 16918A**

100mm Thermalite Turbo blocks with acrylic sealed mortar joints	0.22
100mm Thermalite Turbo blocks with standard mortar joints	1.04

The performance of Thermalite within completed dwellings has been proven by tests carried out by a leading house builder. Using Thermalite in the inner leaf of the cavity walls, the dwellings all achieved less than the required value of 10m<sup>3</sup>/(h.m<sup>2</sup>) @ 50pa.

The plots, constructed in traditional mortar, gave the following results:

Plot number	Air permeability (m <sup>3</sup> /(h.m <sup>2</sup> ) @ 50Pa)
104	2.60
140	3.96
143	5.90

**Thermalitefact:**

Thermalite aircrete blocks have impressive air permeability, which gives enhanced building fabric performance.

The Green Guide ratings are based on life cycle assessment (LCA) of the materials which make up a building element, e.g. an external wall. LCA measures and assesses a range of environmental impacts from 'cradle to grave'.

Most of the data is collected from trade associations and so is usually generic.

The specifications are compared over a 60-year study period and items such as repair and maintenance are examined. A score for each specification is calculated and ranges from A+ (lowest environmental impact) to E (highest environmental impact).

**Green Guide Mat 1 assessment**

Credits are awarded based upon the Green Guide ratings for the following elements:

- Roof
- External walls
- Internal walls (including separating walls)
- Upper and ground floors (inc. separating floors)
- Windows

**Mandatory requirement:**

Three out of the five elements must achieve a rating of A+ to D.

**Credits are awarded as follows:**

Green Guide Rating	Credits
A+	3
A	2
B	1
C	0.5
D	0.25
E	0

Where there is more than one specification for an element (e.g. more than one type of floor) credits are awarded depending on the % area for each specification.

**Thermalite Green Guide ratings**

Thermalite affects three out of five of the elements and plays a part in the overall rating of the specification. Thermalite's LCA has raised the rating above the generic aircrete rating on a number of Robust Detail separating wall specifications. (See Green Guide ratings table, page 14).

For a complete list of aircrete construction details go to the green guide online at:

[www.thegreenguide.org.uk](http://www.thegreenguide.org.uk)



**Thermalitefact:**

Thermalite's life cycle assessment means that it achieves better than the generic aircrete rating on a number of Robust Detail separating wall specifications.

**Thermalite Green Guide 2009 ratings and Code for Sustainable Homes credits**

Generic Green Guide rating met  
 Generic Green Guide rating exceeded

Wall and building type	Block type	Element number	Green Guide rating	Code Mat 1 credits
Brickwork outer leaf, insulation, aircrete blockwork inner leaf, cement mortar, plasterboard on battens, paint.	Generic	806170615	A+	3
	Thermalite	906170108	A+	3
Cement rendered aircrete blockwork cavity wall, insulation, cement mortar, plasterboard on battens, paint.	Generic	806180035	A+	3
	Thermalite	906180001	A+	3
Insulated polymeric render system, 215mm aircrete blockwork with cement mortar, insulation, plasterboard on battens, paint.	Generic	806450637	A+	3
	Thermalite	906450638	A+	3
Robust Detail E-WM-10: Twin leaf 100mm solid aircrete blocks (600-800kg/m <sup>3</sup> ), thin joint system, with 75mm min. cavity, proprietary wall ties, 8mm sand:cement render, gypsum-based board (8kg/m <sup>2</sup> ) on dabs with paint to each side.	Generic	818190023	B	1
	Thermalite	918190002	A	2
Robust Detail E-WM-6: Twin leaf 100mm solid aircrete blocks (600-800kg/m <sup>3</sup> ), with 75mm min. cavity, Type A wall ties, 8mm cement:sand render and gypsum-based board (8kg/m <sup>2</sup> ) on dabs with paint, to each side.	Generic	818190020	C	0.5
	Thermalite	918190003	B	1
Robust Detail E-WM-15: Twin leaf 100mm solid aircrete blocks (600-800kg/m <sup>3</sup> ), with 75mm min. cavity including proprietary glass wool acoustic batts, Type A wall ties, with gypsum-based board (9.8kg/m <sup>2</sup> ) on dabs with paint, to each side.	Generic	918190001	B	1
	Thermalite	918190004	A	2
Aircrete blockwork, plasterboard and paint.	Generic	809180003	B	1
	Thermalite	909189004	B	1

- External walls built with Thermalite can achieve the highest Green Guide rating of A+, and the maximum of 3 Code Mat 1 credits.
- Separating walls built to Robust Details E-WM-10, E-WM-6, and E-WM-15 using Thermalite all gain better Green Guide ratings than generic aircrete.
- E-WM-10 and E-WM-15 with Thermalite gives 2 Code Mat 1 credits; 1 credit higher than generic aircrete.
- E-WM-6 using Thermalite gives 1 Code Mat 1 credit; 0.5 credits higher than generic aircrete.
- Thermalite Environmental Profile certificates can be downloaded from [www.greenbooklive.com](http://www.greenbooklive.com) (Certificate number ENP 168)

**Definition of responsible sourcing**

Responsible sourcing of materials (RSM) provides a way of managing a product from the point at which a material is mined or harvested in its raw state through manufacture and processing, through use, re-use and recycling, until its final disposal as waste.

RSM is demonstrated through supply chain management and product stewardship and encompasses social, economic and environmental dimensions.

**Mat 2 assessment**

Credits are awarded where materials used in key building elements are responsibly sourced.

**The key building elements are:**

- Frame
- Ground floor
- Upper floors (including separating floors)
- Roof
- External walls
- Internal walls (including separating walls)
- Foundations/sub-structure (excluding sub-base materials)
- Staircase

Each element is broken down into its component materials. These materials fall into two categories and are either 'assessed materials' or 'excluded materials', as shown in the table on the right.

**Assessed material**

- Brick
- Resin-based composite materials (GRP, etc)
- Concrete
- Glass
- Plastics and rubbers
- Metals
- Stone
- Timber, wood panel products and wood-based composites
- Plasterboard and plaster
- Bituminous materials
- Other mineral-based materials (fibre cement, etc)
- Products with recycled content

**Excluded material**

- Insulation
- Fixings
- Adhesives
- Additives

Volumes of the assessed materials, along with the appropriate tier level (see table below) if applicable, are entered into the Mat 2 calculator. This calculator then gives a points score which is then converted to credits.

**Thermalitefact:**  
 All Thermalite products are certified to the responsible sourcing standard BES 6001 and achieve a rating of very good which equates to tier level 1.

**Mat 2 – Responsible sourcing tier levels**

Tier level	Issue assessed	Points available per element	Evidence/measure assessed	Examples of compliant schemes*
1	Legality and responsible sourcing	3	Certification scheme	FSC, CSA, SFI with CoC, PEFC, Reused Materials, schemes compliant with BES6001:200861 (or similar) Excellent and Very Good performance ratings.
2a	Legality and responsible sourcing	2.5	Certification scheme	Schemes compliant with BES6001:2008 (or similar) Good performance rating.
2b	Legality and responsible sourcing	2	Certification scheme	Schemes compliant with BES6001:2008 (or similar) Pass performance rating.
3	Legality and responsible sourcing	1.5	Certification scheme / EMS	Timber: MTCC, Verified, SGS, TFT Other materials: Certified environmental management scheme (EMS) for the key process and supply chain. Recycled materials with certified EMS for the key process.
4	Legality and responsible sourcing	1	Certification scheme / EMS	Certified EMS for the key process.

\* Note: For further details of compliant schemes, see Code for Sustainable Homes (Nov. 2010), Table Cat 3.1 Tier Levels.

Credits are awarded for achieving higher standards of sound insulation than those given in Approved Document E of the Building Regulations and demonstrating this by using either pre-completion testing (PCT) or Robust Details.

**Pre-completion testing criteria\***

Houses and bungalows

Criteria	Credits
Airborne sound insulation values $\geq$ 3dB ( $\geq$ 48dB)	1
Airborne sound insulation values $\geq$ 5dB ( $\geq$ 50dB)	3
Airborne sound insulation values $\geq$ 8dB ( $\geq$ 53dB)	4

Flats

Criteria	Credits
Airborne sound insulation values $\geq$ 3dB ( $\geq$ 48dB)	1
Impact sound insulation values $\leq$ 3dB ( $\leq$ 59 dB)	
Airborne sound insulation values $\geq$ 5dB ( $\geq$ 50dB)	3
Impact sound insulation values $\leq$ 5dB ( $\leq$ 57 dB)	
Airborne sound insulation values $\geq$ 8dB ( $\geq$ 53dB)	4
Impact sound insulation values $\leq$ 8dB ( $\leq$ 54 dB)	

\*Sound insulation testing can only be carried out by UKAS-accredited organisations or approved testers belonging to the Association of Noise Consultants. Approved organisations can be found at either: [www.UKAS.org.uk](http://www.UKAS.org.uk) or [www.association-of-noise-consultants.co.uk](http://www.association-of-noise-consultants.co.uk)

**Robust Details**

Separating walls and floors that have been assessed and approved by Robust Details Ltd and found to achieve the performance standards given above.

**Thermalitefact:**  
Thermalite aircrete blocks offer various insulation solutions, which equate to walls built with higher density blocks whilst offering all the performance benefits associated with Thermalite aircrete.

**Thermalite solutions**

**PCT Thermalite solutions**

The construction detail needed will vary with the credits required. Contact our Product Services Department on 08705 258258 for appropriate solutions.

**Thermalite Robust Details**

The table below shows the Robust Detail separating walls applicable to Thermalite. Some of these construction details have better Green Guide ratings than the generic aircrete details.

For further information on the use of these details in flats, please refer to the Thermalite Part E document.



Robust Detail	E-WM-6	E-WM-10	E-WM-13	E-WM-15
Block density range (kg/m <sup>2</sup> )	600–800	600–800	600–800	600–800
Thermalite product(s)	Shield Party Wall Hi-Strength 7 Hi-Strength 10	Shield Party Wall Hi-Strength 7 Hi-Strength 10	Shield Party Wall Hi-Strength 7 Hi-Strength 10	Shield Party Wall Hi-Strength 7 Hi-Strength 10
Block thickness	100mm (min)	100mm (min)	100mm (min)	100mm (min)
Mortar type	General purpose mortar	Thin layer mortar	Thin layer mortar	General purpose mortar
Wall tie	Type 'A'	Ancon Staifix HRT4 <b>or</b> Clan PWT4	No wall ties – the structural adequacy of the wall should be assessed by a structural engineer	Type 'A'
Cavity	75mm (min) clear cavity <b>or</b> Option of using Saint Gobain RD Party Wall Roll	75mm (min) clear cavity <b>or</b> Option of using Saint Gobain RD Party Wall Roll	75mm (min) clear cavity <b>or</b> Option of using Saint Gobain RD Party Wall Roll	75mm (min) leaf-to-leaf, partially filled with 35mm Saint Gobain Isover RD35 mineral wool acoustic batt
Internal finish	Gypsum based board (nominal 8kg/m <sup>2</sup> ) on dabs on nominal 8mm render coat with scratch finish.	Gypsum based board (nominal 8kg/m <sup>2</sup> ) on dabs on nominal 8mm render coat with scratch finish.	Gypsum based board (nominal 8kg/m <sup>2</sup> ) on dabs on nominal 8mm render coat with scratch finish.	Gypsum based board (nominal 9.8kg/m <sup>2</sup> ) on dabs.
Code for Sustainable Homes credits – sound insulation	<b>1</b>	<b>0</b>	<b>3</b>	<b>1</b>
Code for Sustainable Homes credits and Green Guide rating	<b>1 (B)*</b>	<b>2 (A)*</b>	<b>1 (B)</b>	<b>2 (A)*</b>

Notes:  
All constructions require the external (flanking) walls to be masonry with 50mm (min) cavity.  
All plots to be pre-registered with Robust Details Limited.  
All constructions should be built in accordance with the Robust Details Handbook.  
\*Thermalite specific rating which outperforms the generic aircrete rating.

Masonry construction materials are ideal to help achieve all levels of the Code for Sustainable Homes. Their inherent properties of good thermal mass, excellent air permeability (when constructed in accordance with Building Regulations) and high sound insulation help gain points towards various Code levels. In addition, Thermalite's thermal insulating properties help achieve lower U-values and reduce heat loss at junctions of building elements.

Thermalite's life cycle assessment provides a better rating than the generic aircrete rating on a number of Robust Detail separating wall Green Guide specifications. The products have been certified to the Responsible Sourcing of Materials standard - BES 6001 as 'very good' – meaning they achieve the maximum credits available under Mat 2 Responsible Sourcing of Materials.

### Hanson EcoHouse™ – Code Level 4

The Hanson EcoHouse™ was the first masonry house to achieve level 4 of the Code for Sustainable Homes and brings together the latest developments in off-site masonry construction, thermal mass and natural ventilation through the use of its innovative and sustainable products.

Designed as a three-bed detached dwelling, the Hanson EcoHouse™ shows how quickly and easily 'liveable' and saleable properties can be constructed and addresses the key issues of climate change, carbon efficiency and sustainable masonry, representing a building system ideal for the zero carbon houses of the future.



EcoHouse™ – The BRE Innovation Park

### Lawn House – Code Level 6

Hanson has been involved in the development of the UK's first private ecohouse using prefabricated brick and block cavity walls, built to achieve Code Level 6 of the Code for Sustainable Homes. The house, in Burbage, Leicestershire, could have a direct impact on the future of house building in the UK as all new homes are set to be zero carbon by 2016.

Hanson's prefabricated brick and block walling system increases the speed of on-site installation, improves quality and accuracy and has minimal impact on the surrounding environment. The panels consisted of a brickwork outer leaf, insulation and a 100mm Thermalite inner leaf.

The inclusion of Hanson's Thermalite in the construction of Lawn House contributes to the building's good air permeability and high thermal mass. In addition, the house incorporates SUDS as well as photovoltaic panels, solar thermal panels, a sedum roof, greywater harvesting and rainwater harvesting, all enhancing its sustainable credentials.



Lawn House – Leicestershire

## Our companies and products

Hanson UK is split into three business lines – Hanson Quarry Products, Hanson Cement and Hanson Building Products. We also offer a range of contracting services. For detailed information on all areas of Hanson and our products visit: [www.hanson.com/uk](http://www.hanson.com/uk)

### Hanson Quarry Products

- |                 |                      |
|-----------------|----------------------|
| Crushed rock    | Ready-mixed concrete |
| Sand and gravel | Ready-mixed mortar   |
| Asphalt         | Screed               |
| Contracting     | Civil engineering    |

### Hanson Cement

- |             |  |                           |                 |
|-------------|--|---------------------------|-----------------|
| Bulk cement | Ground granulated blastfurnace slag (GGBS) | Pulverised fuel ash (PFA) | Packed products |
|-------------|--|---------------------------|-----------------|



### Hanson Building Products

- |                           |                                   |
|---------------------------|-----------------------------------|
| Bricks                    | Chimneys and roofing              |
| Blocks                    | Cladding                          |
| Precast concrete products | Off-site solutions                |
| Permeable paving (SUDS)   | Specialist brick and block laying |





**Hanson Thermalite – Aircrete Blocks**  
6 Pembroke Road  
Sevenoaks  
Kent  
TN13 1XR

Tel: 08705 626500  
Fax: 08705 626550  
Email: [thermalitesales@hanson.com](mailto:thermalitesales@hanson.com)  
Web: [www.hanson.com/uk/blocks](http://www.hanson.com/uk/blocks)