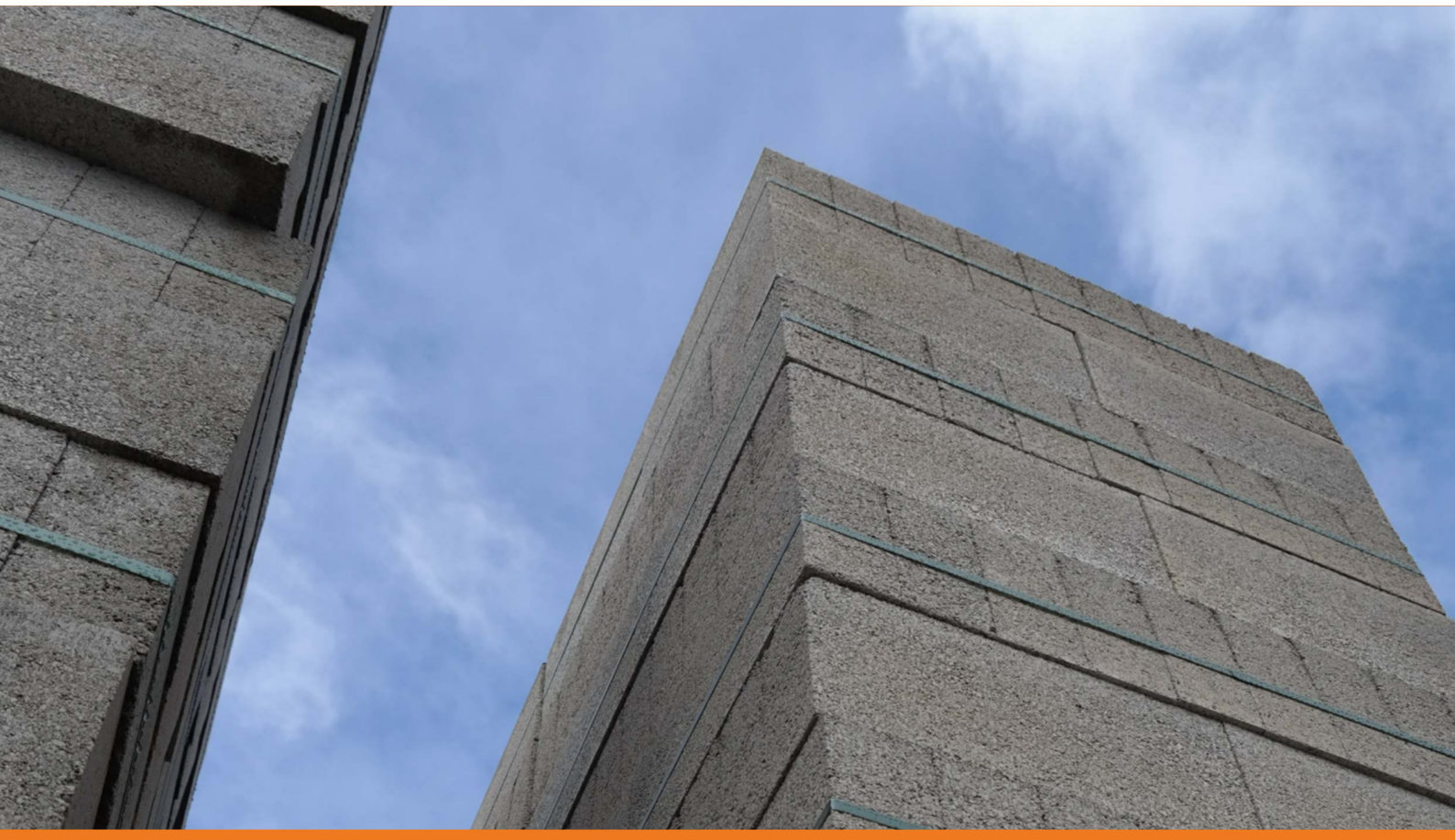
We are Part of the Thomas Armstrong Group

THOMAS ARMSTRONG
(CONCRETE BLOCKS) LTD



Concrete Blocks: Product & Technical Guide

A comprehensive guide to our extensive range of concrete blocks from our group of companies

June 2023

Serving the construction industry since 1830

Founded in 1830 in Cumbria as a timber and sawmill operation we have grown and expanded our operations into quarrying, construction and the manufacturing of concrete blocks and other building products.

We produce a comprehensive range of masonry building and paving blocks compliant to all of the latest technical and environmental standards for use in foundation walls, internal walls, acoustic separating walls, thermally insulating walls and paving solutions for driveways.

We continually strive to further enhance the sustainability credentials of our operations and products through the increased use of recycled material in our blocks and with a commitment to minimise our impact on the environment by reducing energy use throughout our operations and continue to produce high-quality products for the low carbon homes of the future.

Our group of 10 block manufacturing plants are located across the North of England offering a flexible and comprehensive supply network. Our block manufacturing group consists of very well established and respected companies. See back cover of this brochure for further details.

All of the products in our concrete block and block paving ranges are manufactured and sold in compliance with UKCA-marking requirements. UKCA Certificates and Declarations of Performance certificates for each of our products are freely available to download from our website www.thomasarmstrongconcreteblocks.co.uk

We are full members of the UK's leading industry associations; the Concrete Block Association (CBA), the Aircrete Products Association (APA) and the Mineral Products Association (MPA).

Contents

Quality, Environmental and Sustainability

We believe that the key to success as a business is to ensure the very best standards of quality and customer service which is one of the reasons why we have continually grown and developed as a business since 1830.

We are fully committed to minimising our impact upon the environment and to promoting the undoubted and proven sustainability of masonry construction; a quality product using locally sourced materials and supporting local jobs and economies.

Commitment to Quality

We have been in business since 1830 and one of the key reasons for our longevity and continual development as a company is our commitment to quality and ensuring that the customer's needs are at the forefront of everything that we do.

This philosophy encompasses all of our operations from selecting the best raw materials available for our products to employing ISO 9001 Quality Management Systems at our manufacturing sites. All of our concrete blocks are manufactured in strict compliance to the harmonized European standard for masonry products, the EN 771 series.

Environmental Performance

Our block production facilities operate in full compliance with all of the latest environmental regulations with the vast majority of production being certified to the world class ISO 14001 Environmental Management System standard. We aim to have 100% of our production fully ISO 14001 EMS certified. As part of this, at all of our production facilities we focus on waste minimisation and recycling wherever possible.

Our blocks have been environmentally profiled by BRE to give generic Green Guide ratings and all blocks are fully recyclable at the end of the life of the construction.

We are certified to the world-leading Responsible Sourcing standard BES 6001.

Environmental Policy

We are committed to preventing pollution and to conducting our operational and business activities in an environmentally responsible manner. We recognise the need to continually improve our operations wherever practical to do so in order to reduce our impact on the environment. To achieve these objectives we shall:

- Comply with and wherever possible exceed all applicable environmental legislation and regulatory requirements. This includes any other applicable environmental requirements relevant to our activities, products and services. This is regularly evaluated to ensure our compliance with such requirements.
- Identify and use materials and processes that reduce the risk of pollution, evaluate all significant environmental impacts and aspects with the objective to eliminate these impacts wherever possible.
- Promote conservation of natural resources through the efficient use of energy and the minimisation of waste. We take proactive measures to protect wildlife and natural flora and fauna at our sites and preserve natural habitats.
- Minimise discharges, emissions and waste. Maximise recycling wherever possible.
- Utilise raw materials that have the minimum environmental impact for local sources and use recycled raw materials wherever possible.
- We set environmental objectives and targets which are continually reviewed and updated and use these as a measure of our environmental performance.
- Stringently develop operational procedures and training regimes to assure environmental performance at all times and regularly carry out emergency response exercises to ensure that all staff can respond to unforeseen incidents and protect the environment from any consequential harm.
- We continually measure and review our performance through a programme of regular internal and external audits and wherever possible utilise an environmental management system compliant with BS EN ISO 14001 & BES 6001 at our manufacturing sites.
- We ensure that employees at all levels throughout the company are informed of and participate in the adherence to our environmental policy through training, communication and awareness.

Responsibly Sourced Raw Materials

In common with the concrete block industry in general, we manufacture from locally sourced raw materials, support local jobs and economies and minimise our environmental impact by sourcing as close as possible to our manufacturing facilities.

The concrete block manufacturing process produces very little or no waste whatsoever. Any product which is not suitable for sale is completely recycled back into the manufacturing process to make new blocks.

Transportation of materials into and out of our factories is kept within local regional areas to minimise our carbon footprint and impact on the environment as well as supporting local jobs and economies.

BES 6001 Responsible Sourcing of Construction Products

Our Airtec, Ultralite, Insulite and Dense aggregate blocks are certified to the responsible sourcing standard BES 6001.

Masonry: Built to last several lifetimes.

Masonry buildings can last for generations. Their durability, high performance and versatility has been proven time and again beyond doubt making them the perfect sustainable long-term building solutions for the following reasons:

- Their high thermal mass results in lower seasonal temperature fluctuations than for a similar lightweight framed building. This means a reduction and possible elimination of secondary mechanical heating and cooling technologies than may be required for a lightweight building. The consequence of this being a significant reduction of CO_2 over the lifetime of the building and lower energy bills for residents.
- Masonry buildings are easy to modify and extend onto unlike framed constructions. This makes masonry buildings a much more versatile, flexible and sustainable building method which extends their lifetime and effectively future-proofs them.
- On demolition, blocks are 100% recyclable and no hazardous waste is produced.

Aggregate concrete block and aerated concrete block verified cradle to grave Environmental Product Declarations (EPD's) are available - see our website for further details.

Insulite Lightweight Blocks

A large proportion of material used in our Insulite blocks is fully recycled or reclaimed. These products consist of over 40% by weight recycled or reclaimed raw materials.

Dense Concrete Blocks

Dense blocks require a proportion of quarried sand and gravel in order to achieve their exceptional toughness, durability and load-bearing capacity. These products consist of over 20% by weight recycled or reclaimed raw materials.

Airtec Aerated Blocks

Up to 80% of all raw material used in the production of Airtec blocks is recycled. Airtec is manufactured in the UK's most advanced facility using a unique process resulting in superior product performance and highly efficient energy recovery systems.

Our Products

Ultralite
Low Density Aggregate Blocks

Low weight traditional aggregate blocks with enhanced thermal properties.

Insulite
Medium Density Aggregate Blocks

The traditional all-round building block for background and internal paint-grade grade applications.

Dense
Concrete Blocks

Highly resilient, tough, loadbearing blocks suitable for any background or internal paint-grade application. Available in solid, cellular and hollow forms.

Airtec
Aerated Concrete Blocks

Exceptionally high performance blocks with the lowest thermal conductivity of any masonry block currently available in the UK.

Special Products
Bricks, slips, infill blocks

A wide range of Airtec, Insulite and Dense concrete special products including coursing bricks, concrete commons, slip blocks and T-beam infill blocks.

NBS Source PARTNER

NBS Specification Clauses and digital BIM Objects for our block range can be found on NBS Source

www.source.thenbs.com

Overview of our products

	Airtec XL	Airtec Standard	Airtec Party Wall	Airtec Seven
	Airtec XL blocks have the lowest thermal conductivity value of any block currently manufactured in the UK, combining exceptionally low weight, strength and high thermal performance.	These low-weight, versatile building blocks are unique in offering a strength of 3.6N/mm² but with a thermal conductivity value of just 0.11 W/mK.	100mm thick blocks designed for use in Robust Standard Detail acoustic separating walls and Part E walls.	Higher strength aerated blocks intended for use in applications where higher loadbearing capacity or physical toughness is required.
Gross Dry Density, kg/m³	460	530	600	730
Compressive Strength, N/mm²	2.9	3.6	3.6	7.3
Thermal Conductivity, W/mK	0.09	0.11	0.13	0.17
Applications				
Below dpc (1)		●	●	●
Beam & Block Floor infill (2)				●
Internal leaves of cavity walls	●	●	●	●
External leaves of cavity walls (3)		●	●	●
Robust Detail party walls			●	●

Airtec Blocks

Airtec aerated blocks have a plain-faced, smooth, cellular texture which is a suitable background for accepting renders and plasters.

In common with all aerated concrete products in the UK, the surfaces of the blocks may contain a random amount of larger cells due to an unavoidable consequence of the manufacturing process. These large cells are perfectly normal and are not a defect and do not detract from performance in any way.

Although the blocks can be painted, we cannot guarantee that the surfaces will not contain some of these larger cells and we therefore do not recommend using Airtec for paint-grade or fair-faced applications.

Standard Texture

Ultralite, Insulite and Dense Concrete Standard texture finish is intended for use in background applications.

Their relatively open texture provides the perfect substrate for application of renders and plasters.

Standard texture blocks are not intended for fair-faced facing or paint-grade applications and due to the use of locally sourced raw materials, their texture and colour will vary between manufacturing locations.

(1) Block strength of 7.3 N/mm² or greater.
(2) Block strength of 7.3 N/mm² or greater.
(3) Blocks are not weatherproof nor waterproof and are not suitable for unfinished external applications. External leaves must be fully protected e.g. render, cladding.

We also produce a range of lightweight and dense coursing bricks, concrete common bricks, slip blocks and split coursing blocks for block and beam flooring applications.






Ultralite	Insulite	Solid Dense	Cellular Dense	Hollow Dense	Rockfaced Blocks
Low density aggregate concrete blocks manufactured using lightweight aggregates. These blocks are low weight with enhanced thermal properties.	Insulite medium density blocks are a versatile, all-round building block. Available in Standard and 'Premier' paint-grade finishes and as solid Armstart foundation blocks.	Highly durable and resilient Dense concrete blocks available in Standard and paint-grade finishes. They are also available as small format MIDI blocks.	A lower weight alternative to the solid dense block with improved thermal properties. The cells are blinded at one end to accept a full bed of mortar for ease of build.	Ideal for constructing reinforced walls, the hollow voids can be filled with poured concrete and steel reinforcement. Perfect for commercial, industrial and agricultural applications.	A light coloured, close-textured dense concrete block manufactured at our Congleton plant. The rippled rock appearance on one face makes them an attractive option for facing applications.
1050 - 1150	1450 - 1550	1850 - 2100	1850 - 2100	1850 - 2100	2000 - 2200
3.6, 7.3	3.6, 4.2, 7.3 †	7.3, 10.4 †	7.3 †	7.3 †	10.4
0.32	0.49	1.17	0.88	0.88	1.22
●	●	●		●	
	●	●			
●	●	●	●		
●	●	●	●		●
	●	●			

† Indicates that higher strengths may be available. Please check with your local sales office

Premier Insulite

Premier is a closer textured Insulite medium density lightweight aggregate block whose smoother surface offers an excellent paint-grade finish.

Due to the use of reclaimed and recycled raw materials in these blocks, the precise texture and shade of blocks may vary from batch to batch and also between manufacturing locations.

For this reason, Premier Insulite blocks are the perfect paint-grade block but are not intended for use in unfinished decorative fair-faced applications where consistency of colour and texture is critical.

Dense Paint Grade

Dense Paint Grade concrete blocks have a close textured finish suitable internal, painted applications. Their colour and shade is not guaranteed and therefore are not suitable for unfinished fair-faced applications.

Due to the sustainable approach that we have to manufacturing, locally sourced raw materials are used in each plant and as a consequence texture and shade will vary between manufacturing locations.

The colour and shade cannot be guaranteed from batch to batch and for this reason they are not suitable for use in decorative fair-faced applications.

The texture images used here are intended for indicative purposes only and actual textures and shades may vary between manufacturing locations.
For further information and sample blocks, please contact your local sales office - details can be found on the back cover of this brochure.
We advise the construction sample panels on site as masonry appearance cannot be appreciated from individual blocks.

ULTRALITE

Low Density Aggregate Blocks

Ultralite blocks offer the builder a low-weight, loadbearing block with enhanced thermal properties suitable for a wide range of applications.

Ultralite blocks are manufactured from natural low density aggregates and all sizes weigh less than 20kg.

Available in Standard texture only.

TECHNICAL PROPERTIES

Property	Value
Face Size (BS EN 771-3):	440mm x 215mm
Dimensional Tolerance (BS EN 772-16):	Category D1
Gross Dry Density (BS EN 772-13):	1050 - 1150 kg/m³
Mean Compressive Strength (BS EN 772-1):	3.6, 7.3 N/mm²
Manufacturing Category (BS EN 771-3):	Category II
Thermal Conductivity (BS EN 1745):	0.32 W/mK (Protected inner leaf) 0.34 W/mK (Exposed outer leaf)
Moisture Movement (BS EN 772-14):	< 0.6 mm/m
Fire Resistance (BS EN 13501-1):	Class A1 Reaction to Fire
Configuration (BS EN 1996-1-1):	Solid - Group 1
Available Texture finish:	Standard only

APPLICATIONS

- Inner & outer leaf of external cavity walls up to 3 storeys (7.3 N/mm² only).
- Internal partition walls.
- Walls below dpc (7.3 N/mm² only).
- Acoustic separating walls to Part E of the Building Regulations.
- Standard texture finish provides an excellent surface for mortars, renders and plasters.
- Lower weight, safer handling, easy to cut and accepts most standard fixings.
- Not suitable for unfinished external applications.

PHYSICAL PROPERTIES

Block Size mm	'R' Value m²k/W	Walled Weight kg/m² See Note 1	Sound Reduction Rw, dB See Note 2	Block Weight kg See Note 3	Fire Resistance Hours See Note 4
100	0.31	118	44	10.7	4
140	0.44	165	47	15.0	4

PACK DETAILS

Block Size mm	Blocks per pack	m² per pack
100	72	7.2
140	48	4.8

1. Walled weight is for a single-leaf wall, plastered on both sides.
2. Sound Reduction Rw values are based on wall mass and assumes a plastered finish on both sides.
3. The block weights quoted above are approximate and include the typical additional weight from the equilibrium (3%) moisture content of the block. Received block weights will be significantly higher and are variable due to moisture content.
4. Fire resistance periods to BS EN 1996-1-2 for a single-leaf, non-loadbearing plastered wall.

Pack sizes and quantities vary slightly between manufacturing locations. Always check details with your nearest sales office.

INSULITE

Medium Density Aggregate Blocks

Insulite blocks are the perfect all-round building block. They are cost effective, simple to use and provide an ideal background for accepting renders and plasters. Insulite blocks incorporate a significant proportion of high quality recycled and reclaimed raw material.

They are available in Standard and 'Premier' paint-grade finishes.

Note: Insulite blocks made at our former Sellite Blocks Ltd factory are known as 'Thermal Blocks'.

TECHNICAL PROPERTIES

Property	Value
Face Size (BS EN 771-3):	440mm x 215mm
Dimensional Tolerance (BS EN 772-16):	Category D1
Gross Dry Density (BS EN 772-13):	1450 - 1550 kg/m³
Mean Compressive Strength (BS EN 772-1):	3.6, 4.2, 7.3 N/mm² Higher strengths are available to order
Manufacturing Category (BS EN 771-3):	Category II
Thermal Conductivity (BS EN 1745):	0.49 W/mK (Protected inner leaf) 0.54 W/mK (Exposed outer leaf)
Moisture Movement (BS EN 772-14):	< 0.6 mm/m
Fire Resistance (BS EN 13501-1):	Class A1 Reaction to Fire
Configuration (BS EN 1996-1-1):	Solid - Group 1
Available Texture finish:	Standard & Premier paint grade

APPLICATIONS

- Inner & outer leaf of external cavity walls up to 3 storeys (7.3 N/mm² or above).
- Internal partition walls.
- Block & beam floor infill (7.3 N/mm² or above).
- Walls below dpc (7.3 N/mm² or above).
- Acoustic separating walls to Part E of the Building Regulations and Robust Details.
- Standard texture finish provides an excellent surface for mortars, renders and plasters. Premier close textured finish available for internal paint-grade applications.
- Not suitable for unfinished external applications.

PHYSICAL PROPERTIES

Block Size mm	'R' Value m²k/W	Walled Weight kg/m² See Note 1	Sound Reduction Rw, dB See Note 2	Block Weight kg See Note 3	Fire Resistance Hours See Note 4
75	0.15	117	44	11.0	2
100	0.20	157	46	14.6	4
140	0.29	219	49	20.5	4

PACK DETAILS

Block Size mm	Blocks per pack	m² per pack
75	96	9.6
100 (Void Pack)	72 or 90 (84 or 86)	7.2 or 9.0 (8.4 or 8.6)
140 (Void Pack)	60 (56)	6.0 (5.6)

1. Walled weight is for a single-leaf wall, plastered on both sides.
2. Sound Reduction Rw values are based on wall mass and assumes a plastered finish on both sides.
3. The block weights quoted above are approximate and include the typical additional weight from the equilibrium (3%) moisture content of the block. Received block weights will be significantly higher and are variable due to moisture content.
4. Fire resistance periods to BS EN 1996-1-2 for a single-leaf, non-loadbearing plastered wall.

Pack sizes and quantities vary slightly between manufacturing locations. Always check details with your nearest sales office.

DENSE

Solid Dense Concrete Blocks

Dense Concrete blocks are the most durable and resilient block type in our range of products. Perfect for applications requiring high loadbearing capacity, high acoustic performance and internal paint-grade applications.

Dense blocks are manufactured from high quality Class 2 aggregates and utilise a significant proportion of high quality recycled raw material.

Available in Standard and Paint Grade finishes.

TECHNICAL PROPERTIES

Property	Value
Face Size (BS EN 771-3):	440mm x 215mm
Dimensional Tolerance (BS EN 772-16):	Category D1
Gross Dry Density (BS EN 772-13):	1850 - 2100 kg/m³
Mean Compressive Strength (BS EN 772-1):	7.3, 10.4 N/mm² Higher strengths are available to order
Manufacturing Category (BS EN 771-3):	Category II
Thermal Conductivity (BS EN 1745):	1.17 W/mK (Protected inner leaf) 1.26 W/mK (Exposed outer leaf)
Moisture Movement (BS EN 772-14):	< 0.6 mm/m
Fire Resistance (BS EN 13501-1):	Class A1 Reaction to Fire
Configuration (BS EN 1996-1-1):	Solid - Group 1
Available Texture finish:	Standard & Paint Grade

APPLICATIONS

- Inner & outer leaf of external cavity walls over 3 storeys.
- Internal partition walls.
- Block & beam floor infill.
- Walls below dpc.
- Acoustic separating walls to Part E of the Building Regulations and Robust Details.
- Standard texture provides an excellent surface for mortars, renders and plasters. Paint Grade close textured finish available for internally painted applications.
- Not suitable for unfinished external applications.

PHYSICAL PROPERTIES

Block Size mm	'R' Value m²k/W	Walled Weight kg/m² See Note 1	Sound Reduction Rw, dB See Note 2	Block Weight kg See Note 3	Fire Resistance Hours See Note 4
75	0.06	143	46	13.5	2
100	0.09	190	48	18.0	4
140	0.12	266	51	25.2	4

PACK DETAILS

Block Size mm	Blocks per pack	m² per pack
75	96	9.6
100 (Void Pack)	72 (86)	7.2 (8.6)
140 (Void Pack)	48 (44)	4.8 (4.4)

1. Walled weight is for a single-leaf wall, plastered on both sides.
2. Sound Reduction Rw values are based on wall mass and assumes a plastered finish on both sides.
3. The block weights quoted above are approximate and include the typical additional weight from the equilibrium (3%) moisture content of the block. Received block weights will be significantly higher and are variable due to moisture content.
4. Fire resistance periods to BS EN 1996-1-2 for a single-leaf, non-loadbearing plastered wall.

Pack sizes and quantities vary slightly between manufacturing locations. Always check details with your nearest sales office.

MIDI

Small Format Solid Dense Concrete Blocks

MIDI blocks offer the same characteristics of a 140mm solid dense concrete block but at only 66% of the weight. This means a lighter block with easier manual handling.

MIDI blocks are manufactured from high quality Class 2 aggregates and utilise a significant proportion of high quality recycled raw material.

Available in Standard and Paint Grade finishes.

TECHNICAL PROPERTIES

Property	Value
Face Size (BS EN 771-3):	290mm x 215mm
Dimensional Tolerance (BS EN 772-16):	Category D1
Gross Dry Density (BS EN 772-13):	1850 - 2100 kg/m³
Mean Compressive Strength (BS EN 772-1):	7.3, 10.4 N/mm² Higher strengths are available to order
Manufacturing Category (BS EN 771-3):	Category II
Thermal Conductivity (BS EN 1745):	1.17 W/mK (Protected inner leaf) 1.26 W/mK (Exposed outer leaf)
Moisture Movement (BS EN 772-14):	< 0.6 mm/m
Fire Resistance (BS EN 13501-1):	Class A1 Reaction to Fire
Configuration (BS EN 1996-1-1):	Solid - Group 1
Available Texture finish:	Standard & Paint Grade

APPLICATIONS

- Inner & outer leaf of external cavity walls over 3 storeys.
- Internal partition walls.
- Walls below dpc.
- Acoustic separating walls to Part E of the Building Regulations and Robust Details.
- Standard texture provides an excellent surface for mortars, renders and plasters. Paint Grade close textured finish available for internally painted applications.
- Lower weight, safer handling
- Not suitable for unfinished external applications.

PHYSICAL PROPERTIES

Block Size mm	'R' Value m²k/W	Walled Weight kg/m² See Note 1	Sound Reduction Rw, dB See Note 2	Block Weight kg See Note 3	Fire Resistance Hours See Note 4
290 x 215 x 140	0.12	266	51	17.0	4

PACK DETAILS

Block Size mm	Blocks per pack	m² per pack
290 x 215 x 140	72	4.8

1. Walled weight is for a single-leaf wall, plastered on both sides.
2. Sound Reduction Rw values are based on wall mass and assumes a plastered finish on both sides.
3. The block weights quoted above are approximate and include the typical additional weight from the equilibrium (3%) moisture content of the block. Received block weights will be significantly higher and are variable due to moisture content.
4. Fire resistance periods to BS EN 1996-1-2 for a single-leaf, non-loadbearing plastered wall.

Pack sizes and quantities vary slightly between manufacturing locations. Always check details with your nearest sales office.

CELLULAR

Dense Concrete Blocks

Cellular Dense blocks offer a lower weight alternative to solid Dense blocks with improved thermal properties. Blinded cells on the upper face allows for a full bed of mortar and easier build.

Cellular Dense blocks are manufactured from high quality Class 2 aggregates and utilise a significant proportion of high quality recycled raw material.

Available in Standard and Paint Grade finishes.

TECHNICAL PROPERTIES

Property	Value
Face Size (BS EN 771-3):	440mm x 215mm
Dimensional Tolerance (BS EN 772-16):	Category D1
Net Dry Density (BS EN 772-13):	1850 - 2100 kg/m³
Mean Compressive Strength (BS EN 772-1):	7.3 N/mm²
Manufacturing Category (BS EN 771-3):	Category II
Thermal Conductivity (BS EN 1745):	0.88 W/mK (Protected inner leaf) 0.92 W/mK (Exposed outer leaf)
Moisture Movement (BS EN 772-14):	< 0.6 mm/m
Fire Resistance (BS EN 13501-1):	Class A1 Reaction to Fire
Configuration (BS EN 1996-1-1):	Cellular - Group 2
Available Texture finish:	Standard & Paint Grade

APPLICATIONS

- Inner & outer leaf of external cavity walls up to 3 storeys.
- Internal partition walls.
- Standard texture provides an excellent surface for mortars, renders and plasters. Paint Grade close textured finish available for internally painted applications.
- Lower weight, safer handling, easy to cut and accepts most standard and heavy-duty fixings.
- Not suitable for unfinished external applications.

PHYSICAL PROPERTIES

Block Size mm	'R' Value m²k/W	Walled Weight kg/m² See Note 1	Sound Reduction Rw, dB See Note 2	Block Weight kg See Note 3	Fire Resistance Hours See Note 4
100	0.11	165	47	15.5	2
140	0.16	204	49	19.0	4

PACK DETAILS

Block Size mm	Blocks per pack	m² per pack
100	90	9.0
140 (Void Pack)	60 (56)	6.0 (5.6)

1. Walled weight is for a single-leaf wall, plastered on both sides.
2. Sound Reduction Rw values are based on wall mass and assumes a plastered finish on both sides.
3. The block weights quoted above are approximate and include the typical additional weight from the equilibrium (3%) moisture content of the block. Received block weights will be significantly higher and are variable due to moisture content.
4. Fire resistance periods to BS EN 1996-1-2 for a single-leaf, non-loadbearing plastered wall.

Pack sizes and quantities vary slightly between manufacturing locations. Always check details with your nearest sales office.

HOLLOW

Dense Concrete Blocks

Hollow Dense blocks are ideal for agricultural, industrial and commercial applications. Strong reinforced walls can be constructed quickly and economically.

Hollow Dense blocks are manufactured from high quality Class 2 aggregates and utilise a significant proportion of high quality recycled raw material.

Available in Standard and Paint Grade finishes.

TECHNICAL PROPERTIES

Property	Value
Face Size (BS EN 771-3):	440mm x 215mm
Dimensional Tolerance (BS EN 772-16):	Category D1
Net Dry Density (BS EN 772-13):	1850 - 2100 kg/m³
Mean Compressive Strength (BS EN 772-1):	7.3 N/mm²
Manufacturing Category (BS EN 771-3):	Category II
Thermal Conductivity (BS EN 1745):	0.88 W/mK (Protected inner leaf) 0.92 W/mK (Exposed outer leaf)
Moisture Movement (BS EN 772-14):	< 0.6 mm/m
Fire Resistance (BS EN 13501-1):	Class A1 Reaction to Fire
Configuration (BS EN 1996-1-1):	Hollow - Group 2
Available Texture finish:	Standard & Paint Grade

APPLICATIONS

- Agricultural and commercial applications where large, external wall panels are required, e.g. sheds, bunkers and retaining walls.
- Some or all of the cores can be filled with poured concrete and steel rebar to form extremely strong reinforced walls with high resistance to lateral loads. Ideal for lining swimming pools, ponds etc.
- Standard texture provides an excellent surface for mortars, renders and plasters. Paint Grade close textured finish available for internally painted applications.
- Half the equivalent weight of a solid block of the same thickness.

PHYSICAL PROPERTIES

Block Size mm	'R' Value m²k/W	Walled Weight kg/m² See Note 1	Sound Reduction Rw, dB See Note 2	Block Weight kg See Note 3	Fire Resistance Hours See Note 4
140	0.16	193	48	19.6	4
215	0.24	257	51	26.0	4

PACK DETAILS

Block Size mm	Blocks per pack	m² per pack
140	60	6.0
215	40	4.0

1. Walled weight is for a single-leaf wall, plastered on both sides.
2. Sound Reduction Rw values are based on wall mass and assumes a plastered finish on both sides.
3. The block weights quoted above are approximate and include the typical additional weight from the equilibrium (3%) moisture content of the block. Received block weights will be significantly higher and are variable due to moisture content.
4. Fire resistance periods to BS EN 1996-1-2 for a single-leaf, non-loadbearing plastered wall.

Pack sizes and quantities vary slightly between manufacturing locations. Always check details with your nearest sales office.

ARMSTART

Medium Density Aggregate Foundation Blocks

Armstart Foundation blocks are available in a range of width and length combinations to provide solid foundation walls for a variety of wall thicknesses.

Solid foundation walls are quicker, more cost-effective and safer to construct than cavity foundation walls and all Armstart blocks weigh less than 20kg for ease of manual handling.

TECHNICAL PROPERTIES

Property	Value
Face Size (BS EN 771-3):	300mm x 275mm x 140mm 350mm x 250mm x 140mm 350mm x 215mm x 140mm
Dimensional Tolerance (BS EN 772-16):	Category D1
Gross Dry Density (BS EN 772-13):	1450 - 1550 kg/m³
Mean Compressive Strength (BS EN 772-1):	7.3 N/mm² Higher strengths are available to order
Manufacturing Category (BS EN 771-3):	Category II
Design Thermal Conductivity (BS EN 1745):	0.49 W/mK
Moisture Movement (BS EN 772-14):	< 0.6 mm/m
Fire Resistance (BS EN 13501-1):	Class A1 Reaction to Fire
Configuration (BS EN 1996-1-1):	Solid - Group 1
Available Texture finish:	Standard finish only

APPLICATIONS

- Solid foundation walls from 250mm - 350mm thick to suit cavity widths of 75mm - 150mm.
- Each block offers 2 alternative widths.
- A simple and safer alternative to cavity foundation walls; no wall ties required, cavity filling or danger of collapsed cavities, faster build rates, less mortar and repetitive manual handling required.
- Suitable for use in soil conditions up to DS-3 as defined in BRE Special Digest 1.
- Higher strengths available to order to suit both low an high-rise buildings.
- All Armstart blocks are below 20kg in weight to comply with HSE and CDM guidelines on repetitive manual handling safety.

PHYSICAL PROPERTIES & PACK DETAILS

Size mm	Block weight,kg See Note 1	Blocks per Pack	Blocks per m²	Linear m per pack	Laying Orientation
		See Note 2			
300 x 275	17.7	72 / 63	21.5 23.4	22.3 / 19.5 20.5 / 18.0	If walled 300mm length (a 275mm wide wall) If walled 275mm length (a 300mm wide wall)
350 x 250	18.8	48 / 56	18.5 25.6	17.3 / 20.2 12.5 / 14.6	If walled 350mm length (a 250mm wide wall) If walled 250mm length (a 350mm wide wall)
350 x 215	16.2	70	29.6	15.8	Walled 215mm length (a 350mm wide wall)

1. Block weights quoted are approximate and include the additional weight from the natural equilibrium moisture content although this can vary slightly. Received block weights will be significantly higher and variable due to moisture content.
2. Pack size quantities may vary between manufacturing locations. Always check details with your nearest sales office.

BRICKS

Coursing Blocks & Concrete Commons

We produce Insulite, Dense Concrete 'Common' and Airtec coursing units for infill around openings and adjustment of coursing heights reducing the need to cut down whole blocks.

Furthermore, by supplying coursing units in all block grades, continuity of material type can be maintained throughout the build helping to avoid differential movement problems and maximise thermal performance.

Individual datasheets on all brick types available from our website.

TECHNICAL PROPERTIES

Property	Insulite Brickettes	Concrete Commons	Airtec Brickettes
Face Size:	65mm x 215mm	65mm x 215mm 73mm x 215mm	65mm x 215mm
Dimensional Tolerance:	Category D1		
Gross Dry Density:	1450 - 1450 kg/m³	1850 - 2100 kg/m³	460, 530 & 730 kg/m³
Mean Compressive Strength:	7.3, N/mm²	21.0 N/mm²	2.9, 3.6 & 7.3 N/mm²
Manufacturing Category:	Category II		Category I
Thermal Conductivity:	0.49 W/mK	1.17 W/mK	0.09, 0.11, 0.17 W/mK
Moisture Movement:	< 0.6 mm/m		
Fire Resistance:	Class A1 Reaction to Fire		
Configuration:	Solid Group 1	Frogged upper face	Solid Group 1
Available Texture, Finish:	Standard only		

APPLICATIONS

- Inner and outer leaf of external cavity walls over 3 storeys.
- Internal partition walls.
- Walls below dpc.
- Acoustic separating walls to Part E of the Building Regulations and Robust Details.
- Standard texture finish provides an excellent surface for mortars, renders and plasters.
- A range of thicknesses available to suit most typical wall types.
- Not suitable for unfinished external applications.

PHYSICAL PROPERTIES & PACK DETAILS

Block Type	Blocks per pack	Block Weight kg	m² per pack	Blocks per m²	Pack details
Insulite Brickettes 100mm	520	2.3	8.67	60	Non-void pack on wooden pallets
	464	2.3	7.73	60	Voided pack
65mm Dense Concrete Commons	416	3.0	7.02	60	Non-void pack on wooden pallets
	424	3.0	7.07	60	Voided pack
73mm Dense Concrete Commons	360	3.3	6.67	54	Voided pack
Airtec Brickettes	520 (100mm) 416 (140mm)	0.66 - 1.05 kg 0.92 - 1.47 kg	8.78 7.02	59.26	Non-void pack on wooden pallets

Pack sizes and quantities may vary between manufacturing locations. Always check details with your nearest sales office.

Void packed coursing units are not available from all manufacturing locations. Always check details with your local sales office.

SPECIAL PRODUCTS

Slip Blocks, Infill Blocks, Rockfaced Blocks

We produce a wide range of slip blocks for maintaining coursing heights and infill blocks for block & beam flooring. When used in conjunction with our Insulite or Dense Concrete blocks, they ensure material continuity throughout the construction.

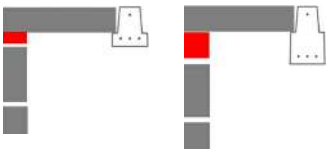
Decorative Rockfaced blocks are available from our Congleton and Aintree facilities.

SLIP BLOCKS AND SPLIT COURSING BLOCKS

Size Width x Depth x Height	Material Type	Strength N/mm²	Density kg/m³	Blocks per pack
440mm x 100mm x 38mm	Dense Concrete	7.3	1850 - 2100	294
440mm x 140mm x 40mm	Dense Concrete	7.3	1850 - 2100	252
"150" Split Coursing blocks 380mm x 100mm x 38mm	Dense Concrete	7.3	1850 - 2100	304
"225" Split Coursing blocks 380mm x 100mm x 113mm	Dense Concrete	7.3	1850 - 2100	128

APPLICATIONS

Slip blocks used to maintain coursing height on adjoining masonry wall for 150mm and 225mm high T-beams.



The "225" split coursing block can be used to course when using a 225mm high beam on a 100mm block wall.

380mm long split coursing blocks are used to close the space between the beams at the ends (for blocks laid 440mm wide and a 525mm beam spacing).

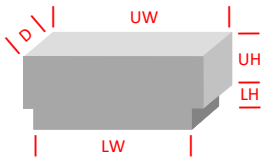
For a 150mm high beam

For a 225mm beam

REBATED INFILL CLOSURE BLOCKS 7.3N/mm² For use with 150mm high T-Beams

Overall Size Width x Depth x Height	Detailed Dimensions (mm)	Blocks per pack	Weight per block (kg)	Weight per pack (T)
530mm x 100mm x 138mm	**UW:** 530 **UH:** 100 **LW:** 480 **LH:** 38 **D:** 100	108	15.0	1.62
530mm x 140mm x 138mm	**UW:** 530 **UH:** 100 **LW:** 480 **LH:** 38 **D:** 140	60	21.0	1.26
335mm x 100mm x 138mm	**UW:** 335 **UH:** 100 **LW:** 285 **LH:** 38 **D:** 100	108	11.0	1.19
505mm x 100mm x 140mm	**UW:** 505 **UH:** 90 **LW:** 448 **LH:** 50 **D:** 100	96	14.5	1.39
205mm x 100mm x 140mm	**UW:** 205 **UH:** 90 **LW:** 148 **LH:** 50 **D:** 100	192	7.0	1.33

KEY: **UW** = Upper width **LW** = Lower width **D** = Depth **UH** = Upper height **LH** = Lower height



All blocks are manufactured in accordance with BS EN 771-3:2011, Category II manufacturing and to dimensional tolerance category D1 +3mm / -5mm on all dimensions.

Packs are banded horizontally and, where necessary, vertically. Packs are supplied on non-returnable wooden pallets

ROCKFACED BLOCKS Light coloured decorative facing blocks

Size	Material	Strength N/mm²	Density kg/m³	Blocks per pack
440mm x 215mm x 100mm	Dense Concrete	10.4	2000 - 2100	56

AIRTEC

Aerated Concrete Blocks

Airtec blocks possess unrivalled technical properties and physical characteristics. They have the lowest available thermal conductivity values of any UK manufactured block and the tightest possible mortar designation TLMB (Thin Layer Mortar B).

All Airtec blocks are BBA certified, Category I manufactured to BS EN 771-4, ISO 9001 Quality assured, ISO 14001 Environmentally accredited and hold BES 6001 Responsible Sourcing certification. Class A1 Reaction to Fire.

TECHNICAL PROPERTIES

	Airtec XL	Airtec Standard	Airtec Party Wall	Airtec Seven
Dry Density, kg/m³	460	530	600	730
Compressive Strength, N/mm²	2.9	3.6	3.6	7.3
Thermal Conductivity, W/mK *Inner leaf (Outer leaf)*	0.09 (0.10)	0.11 (0.13)	0.13 (0.15)	0.17 (0.19)
Available Thicknesses, mm	100 - 215	100 - 215	100	100 - 215
Suitable for block & beam floor infill				●
Large Format blocks available		●		●
Solid Foundation blocks available		●		●

APPLICATIONS

- Inner and outer leaves of external cavity walls. Not suitable for unfinished external applications.
- Internal partition walls.
- Walls below dpc.
- Acoustic separating walls to Part E of the Building Regulations and Robust Details.
- Standard texture finish provides an excellent surface for mortars, renders and plasters.
- Very low weight, safer handling, easy to cut, drill & chase.

PHYSICAL PROPERTIES (selected blocks; please refer to website & datasheets for full details)

Block Size mm	'R' Value m²K/W	Walled Weight kg/m² See Note 1	Sound Reduction Rw, Db See Note 2	Block Weight kg See Note 3	Fire Resistance Hours See Note 4
100mm Airtec XL	1.11	56	40	6.3	4
100mm Airtec Standard	0.91	62	41	7.3	4
100mm Airtec Seven	0.59	82	44	10.0	4
140mm Airtec XL	1.56	78	44	8.8	4
140mm Airtec Standard	1.27	87	45	10.2	4
140mm Airtec Seven	0.82	115	47	14.0	4
100mm Party Wall Block	0.77	72	43	8.6	4

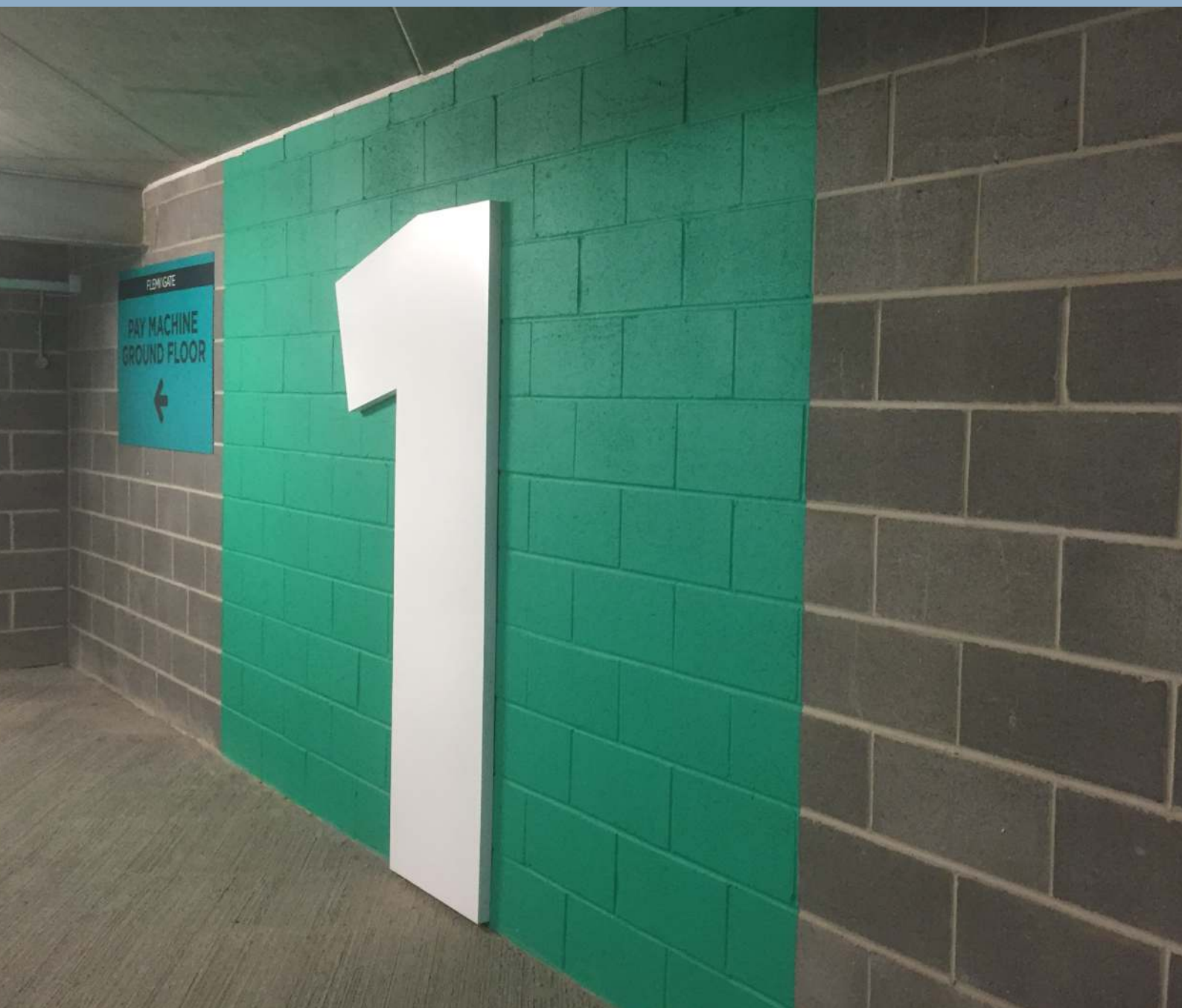
1. Walled weight is for a single-leaf wall, plastered on both sides.
2. Sound Reduction Rw values are based on wall mass and assumes a plastered finish on both sides.
3. The block weights quoted above are approximate and include the typical additional weight from the equilibrium (3%) moisture content of the block. Received block weights will be significantly higher and are variable due to moisture content.
4. Fire resistance periods to BS EN 1996-1-2 for a single-leaf, non-loadbearing plastered wall.

PACK DETAILS

Block Size mm	Blocks per pack	m² per pack
100	56	7.94
140	40	5.67
275 x 140 Foundations	30	2.84
300 x 140 Foundations	30	2.84
275 x 215 Foundations	20	2.84
300 x 215 Foundations	20	2.84
Airtec Large 620 x 430 x 100	28	7.47

Airtec Seven 7.3N blocks are scored at one end with a vertical line to help identification

Technical Performance



Fire

Historically, buildings formed from masonry have proven time and again to be among the safest and most reliable fire-resistant building methods available. This is true both during the construction phase and for the entire lifetime of the building. All of the concrete blocks in our range are non-combustible with zero spread of flame and are classed as Class A1 in accordance with BS EN 13501-1.

The tables below show the notional fire-resistance periods for various block types using general purpose mortar.

Ultralite Blocks & Insulite Blocks

Block mm	Loadbearing Wall (Criteria REI)		Non-loadbearing Wall (Criteria EI)		Cavity Wall (One leaf loaded REI)	
	No Finish	VG Plaster	No Finish	VG Plaster	No Finish	VG Plaster
100	2 hours	4 hours	4 hours	4 hours	2 hours	4 hours
140	3 hours	4 hours	4 hours	4 hours	-	-
215 *(see note)*	4 hours	4 hours	4 hours	4 hours	-	-

Note: 215mm high wall block laid flat

Solid Dense Blocks (including MIDI blocks)

Block mm	Loadbearing Wall (Criteria REI)		Non-loadbearing Wall (Criteria EI)		Cavity Wall (One leaf loaded REI)	
	No Finish	VG Plaster	No Finish	VG Plaster	No Finish	VG Plaster
100	2 hours	4 hours	4 hours	4 hours	2 hours	4 hours
140	3 hours	4 hours	4 hours	4 hours	-	-
215 *(see note)*	4 hours	4 hours	4 hours	4 hours	-	-

Note: 215mm high wall block laid flat

Hollow & Cellular Dense Blocks

Block mm	Loadbearing Wall (Criteria REI)		Non-loadbearing Wall (Criteria EI)		Cavity Wall (One leaf loaded REI)	
	No Finish	VG Finish	No Finish	VG Finish	No Finish	VG Plaster
100	1 hour	1.5 hours	1 hour	2 hours	2 hours	2 hours
140	3 hours	3 hours	4 hours	4 hours	-	-
215	4 hours	4 hours	4 hours	4 hours	-	-

Airtec Aerated Blocks

Block mm	Loadbearing Wall (Criteria REI)		Non-loadbearing Wall (Criteria EI)		Cavity Wall (One leaf loaded REI)	
	No Finish	VG Plaster	No Finish	VG Plaster	No Finish	VG Plaster
100	2 hours	4 hours	4 hours	4 hours	2 hours	2 hours
140	3 hours	4 hours	4 hours	4 hours	-	-
215	4 hours	4 hours	4 hours	4 hours	-	-

Criteria EI = Separating only Criteria REI = Separating and Loadbearing

R – Mechanical resistance E – Integrity I - Insulation

Notes:

1. These tables are only valid for walls complying with BS EN 1996-1-1, BS EN 1996-2 and BS EN 1996-3.
2. Values are based on values given in the National Annex to BS EN 1996-1-2.
3. The thicknesses given are for the masonry alone, excluding finishes.
4. Plaster is assumed to be a minimum of 10mm thick on both faces of a single-leaf wall or on the fire-exposed face of a cavity wall.
5. Sand-cement plaster is not considered to increase the fire resistance of the wall.
6. "VG" refers to vermiculite / gypsum plaster or pearlite / gypsum plaster.
7. These figures are based on mortars using OPC cement and may differ if a non-OPC cement is used in the wall construction.
8. The information given here is only for basic guidance and cannot possibly take account of every scenario regarding fire safety. Expert guidance must be sought wherever possible.

Chimneys

Concrete blocks are not suitable for use in areas where they are subjected to cycles of excessive heating such as fireplaces. Blocks can be used to form the structure of chimneys but must be fully shielded and separated from the heat and exhaust fumes by the use of suitable flue and fire linings.

In accordance with NHBC guidance, our solid Insulite or solid Dense blocks are suitable for use in chimney structures. Airtec and Ultralite blocks are not recommended.

Thermal

Part L 2021 of the Building Regulations came into force in June 2022 as a stepping-stone to another round of significant changes in 2025 when the 'Future Homes Standard' takes effect.

The Future Homes Standard aims to significantly reduce carbon emissions from dwellings by focusing on, among other things, getting the fabric energy efficiency of the building as good as possible before relying on other technologies.

The transitional arrangements for Part L 2021 only apply to homes where building work has commenced on each individual plot before 15th June 2023. This is significant as previous Part L changes could be avoided if work had already started on a site. With Part L 2021 the new regulations apply to any plots that have not yet started.

Part L 2021 Requirements

There are now four separate targets for Part L 2021 supported by the new SAP 10 method of assessment:

1. Primary energy target
2. CO_2 emission rate
3. Fabric Energy Efficiency Standard (FEES)
4. Minimum standards for fabric and fixed building services

Fabric Energy Efficiency Standard (FEES)

Getting the fabric of the building right at the design stage will make achieving compliance easier. There are two u-value categories to be taken into account:

- **Notional u-values** (aka 'nominal' u-values)
- **Limiting u-values** (aka 'backstop' u-values)

The new SAP 10 method of assessment software creates a 'notional' dwelling based on the inputted information and calculates how much energy the proposed construction will use. By achieving the notional u-values, your dwelling should meet the requirements for CO_2 emissions and comply with the requirements.

In cases where notional building element u-values values cannot be achieved, the limiting / backstop u-values can be used. This will however make compliance far more difficult to achieve and must be offset elsewhere in the dwelling thereby adding cost and complexity to the overall design.

New Dwellings

Building Element	Notional (nominal) Value	Limiting (backstop) Value
External Walls	0.18 W/m²K	0.26 W/m²K
Floors	0.13 W/m²K	0.18 W/m²K
Party Walls	0.00 W/m²K	0.20 W/m²K
Roofs	0.11 W/m²K	0.16 W/m²K
Air Permeability	5.0 m³/hr/m²	8.0 m³/hr/m²

Achieving the 'Limiting Value' targets will pass Building Regulations but SAP compliance will be extremely unlikely. Aiming for the Notional Targets is strongly advised!

Existing Dwellings - Extensions

Building Element	Limiting Value
External Walls	0.18 W/m²K
Floors	0.18 W/m²K
Roofs	0.15 W/m²K

There are no limiting / backstop values for existing buildings / extensions and the limiting values shown in this table must be met!

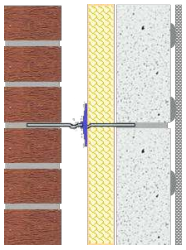
Notes:

- Party wall compliance is achieved by fully-filling the cavity and ensuring effective edge-sealing.
- Air permeability testing must be carried out on each and every dwelling. A sampling approach is no longer allowed.

Linear Thermal Bridging

- Thermal bridging at junctions account for 15-50% of heat losses through the fabric of a new home.
- To meet the TFEE, it is no longer feasible to use a default y-value.
- Heat losses from thermal bridges need to be accurately accounted for in SAP assessments.
- Designers must generally incorporate recognised details that have modelled thermal bridging psi values, or commission psi values to be calculated for a particular detail.
- The energy assessor must calculate the heat losses at these bridges.
- The builder must follow the construction details closely on site.
- We have a complete range of calculated y-values for our entire range of Airtec aerated, Ultralite, Insulite and Dense aggregate concrete blocks.

Example u-value solutions to meet Part L 2021



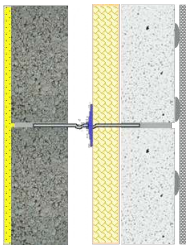
Partial Fill Cavity

Brick outer leaf

50mm (min) clear cavity

100mm block

Drylining on dabs / skim



Partial Fill Cavity

Rendered block outer leaf

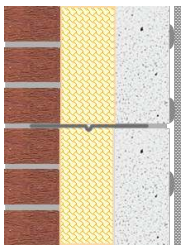
50mm (min) clear cavity

100mm block

Drylining on dabs / skim

Block Type	Notional Target 0.18 W/m²K	Backstop Limit 0.26 W/m²K	Notional Target 0.18 W/m²K	Backstop Limit 0.26 W/m²K
Airtec XL 2.9N	65mm PIR/PU @ 0.018 80mm PIR/PU @ 0.022	35mm PIR/PU @ 0.018 45mm PIR/PU @ 0.022	65mm PIR/PU @ 0.018 75mm PIR/PU @ 0.022	35mm PIR/PU @ 0.018 45mm PIR/PU @ 0.022
Airtec Standard 3.6N	65mm PIR/PU @ 0.018 80mm PIR/PU @ 0.022	40mm PIR/PU @ 0.018 50mm PIR/PU @ 0.022	65mm PIR/PU @ 0.018 80mm PIR/PU @ 0.022	40mm PIR/PU @ 0.018 45mm PIR/PU @ 0.022
Airtec Seven 7.3N	70mm PIR/PU @ 0.018 85mm PIR/PU @ 0.022	45mm PIR/PU @ 0.018 55mm PIR/PU @ 0.022	70mm PIR/PU @ 0.018 85mm PIR/PU @ 0.022	45mm PIR/PU @ 0.018 50mm PIR/PU @ 0.022
Ultralite	75mm PIR/PU @ 0.018 90mm PIR/PU @ 0.022	50mm PIR/PU @ 0.018 60mm PIR/PU @ 0.022	75mm PIR/PU @ 0.018 90mm PIR/PU @ 0.022	45mm PIR/PU @ 0.018 55mm PIR/PU @ 0.022
Insulite	75mm PIR/PU @ 0.018 95mm PIR/PU @ 0.022	50mm PIR/PU @ 0.018 60mm PIR/PU @ 0.022	75mm PIR/PU @ 0.018 90mm PIR/PU @ 0.022	50mm PIR/PU @ 0.018 60mm PIR/PU @ 0.022
Solid Dense	80mm PIR/PU @ 0.018 95mm PIR/PU @ 0.022	50mm PIR/PU @ 0.018 65mm PIR/PU @ 0.022	80mm PIR/PU @ 0.018 95mm PIR/PU @ 0.022	50mm PIR/PU @ 0.018 60mm PIR/PU @ 0.022

The thickness of insulation quoted is the minimum required to meet the target but may not be available as a standard size. The next available size up should be used.

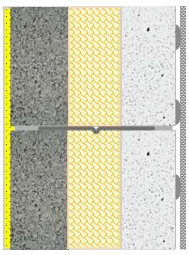


Full Fill Cavity

Brick outer leaf

100mm block

Drylining on dabs / skim



Full Fill Cavity

Rendered block outer leaf

100mm block

Drylining on dabs / skim

Block Type	Notional Target 0.18 W/m²K	Backstop Limit 0.26 W/m²K	Notional Target 0.18 W/m²K	Backstop Limit 0.26 W/m²K
Airtec XL 2.9N	95 (+5mm) batt @ 0.021 125mm batt @ 0.032	100mm batt @ 0.037	95 (+5mm) batt @ 0.021 125mm batt @ 0.030	100mm blown @ 0.039
Airtec Standard 3.6N	95 (+5mm) batt @ 0.021	100mm batt @ 0.034	95 (+5mm) batt @ 0.021	100mm batt @ 0.037
Airtec Seven 7.3N	95 (+5mm) batt @ 0.021	100mm batt @ 0.032	95 (+5mm) batt @ 0.021	100mm blown @ 0.032
Ultralite	95 (+5mm) batt @ 0.021	100mm batt @ 0.030 125mm batt @ 0.037	95 (+5mm) batt @ 0.021 + 27mm insulated drylining	100mm batt @ 0.032
Insulite	150mm batt @ 0.030	100mm batt @ 0.030 125mm batt @ 0.037	95 (+5mm) batt @ 0.021 + 27mm insulated drylining	100mm batt @ 0.030 125mm batt @ 0.037
Solid Dense	150mm batt @ 0.030	125mm batt @ 0.034	95 (+5mm) batt @ 0.021 + 27mm insulated drylining	125mm batt @ 0.034

Insulated Drylining: Overall thickness is quoted, based on extruded polystyrene insulation @ 0.030 W/mK

Indicative examples only and assume taped batts and correction level 0. For a more extensive range of example u-values, a brochure containing 100's of detailed solutions is freely available to download from our website.

Acoustic

Our extensive range of block types offer effective, proven and cost-effective solutions to acoustic performance requirements whether it be achieving compliance with Building Regulations, Robust Details or higher-level performance criteria.

Requirements : Part E of the Building Regulations

The table below is extracted from Approved Document E1 (ADE) of the building regulations and shows the current performance values required of internal walls.

	Airborne sound insulation (minimum values) $D_{nT,w} + C_{tr}$	Impact sound insulation (maximum values) $L'_{nT,w}$
DWELLING HOUSES and FLATS – Purpose Built		
Separating Walls	45 dB	-
Separating Floors & Stairs	45 dB	62 dB
DWELLING HOUSES and FLATS – Formed by a material change of use		
Separating Walls	43 dB	-
Separating Floors & Stairs	43 dB	64 dB
RESIDENTIAL BUILDINGS – Purpose Built		
Separating Walls	43 dB	-
Separating Floors & Stairs	45 dB	62 dB
RESIDENTIAL BUILDINGS – formed by a material change of use		
Separating Walls	43 dB	-
Separating Floors & Stairs	43 dB	64 Db
NON-ACOUSTIC SEPARATING ELEMENTS: INTERNAL WALLS AND FLOORS - Dwellings or Rooms for Residential Purposes - Purpose Built or Formed by a material change of use. Airborne Sound Insulation Rw (minimum values)		
Internal Walls and Floors	40 dB	
SCHOOLS – New Build		
Internal Walls and Floors: Refer to guidance on meeting the requirements given in Building Bulletin 93 'The Acoustic Design of Schools' published by DfES		

Terms: "Dwelling" = Houses and Flats;
"Residential" = Hotels, hostels, residential care homes, halls of residence, boarding houses

Route to Compliance : Pre Completion Testing, PCT

PCT is intended to demonstrated compliance with requirement e E1 of Approved Document E of the Building Regulations. This applies to dwellings and residential buildings. Approved Document E includes a number of example wall and floor constructions which, if constructed in accordance with the guidance, should achieve the acoustic performance in order to comply to the regulations. PCT must however be carried out to demonstrate compliance.

For large developments there is a sampling approach that can be used so that not every single separating wall or floor needs to be tested. The developer needs to liaise with their local building control who will determine the necessary sampling regime.

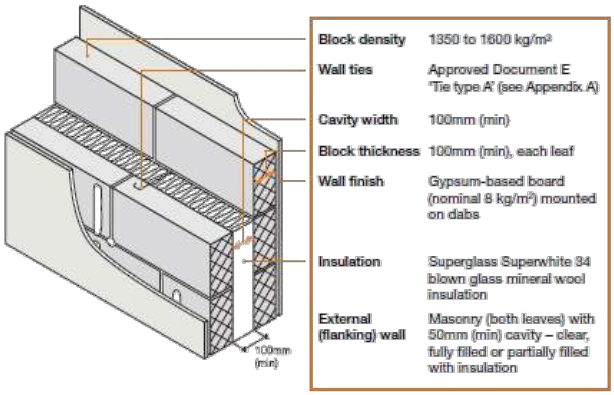
Route to Compliance : Robust Standard Details, RSD's

Robust Standard Details are a collection of various new-build separating wall and floor constructions which, if registered and built in strict accordance with the detail (often referred to as a 'pattern'), eliminates the need for PCT.

The principle behind the Robust Details approach is that each of these patterns have been extensively tested in real-life builds and have been shown to exceed the Building Regulation's minimum requirements by at least 5dB. RSD constructions have been made as practical and simple as possible and are being constantly updated and added to as requirements and regulations change.

In order to utilize the Robust Details approach, an application must be registered with Robust Details Limited and a fee paid. Further details with the complete pattern handbook, free of charge, can be found at www.robustdetails.com.

The example illustration below shows Robust Detail E-WM-33, suitable for Insulite Blocks.
There is a wide range of RSD's available for which are blocks are suitable.
Please contact our Technical Department for further information.



Decibel Ratings

The following table shows the single-figure predicted Airborne sound reduction Rw value of single-leaf masonry walls using each of our block types. These figures are solely based on wall mass and are intended for indicative purposes only. These figures are based on only one structural parameter (i.e. wall mass) and should therefore be used only as an early estimate at the design stage. Actual tested performance may vary significantly and will be affected by multiple factors including workmanship, wall ties, finishes, floors, roofs & flanking junctions and the transmission of sound from other parts of the building and neighbouring structures.

Indicative, predicted airborne sound reduction values for our blocks based on calculation:

Block Type	Thickness mm & Configuration	Approx. Block Wt (at 3% moisture) kg	Wall Mass (at 3% moisture) kg/m²	Predicted Airborne Sound Reduction (Single Leaf) Rw, dB			Robust Details Available?
				Unfinished	Plastered	Dry Lined	
Ultralite	100	10.7	118	43	44	44	
	140	15.0	165	46	47	47	
Insulite	75	11.0	117	43	44	44	
	100	14.6	157	45	46	46	Yes
	140	20.5	219	48	49	49	Yes
	215 (block laid flat)	14.6	340	52	53	53	
Dense	75	13.5	143	44	46	45	
	100	18.0	190	47	48	48	Yes
	100 Cellular	15.5	165	46	47	47	
	140	25.2	266	50	51	51	Yes
	215 (block laid flat)	18.0	409	54	55	55	
	140 MIDI	16.6	266	50	51	51	Yes
Airtec Standard	100	7.3	62	38	41	41	
	140	10.2	87	42	45	44	
	190	13.8	119	46	48	47	
	215	15.6	134	47	49	49	
Airtec Party Wall	100	8.6	72	40	43	42	Yes
Airtec Seven	100	10.0	82	41	44	44	Yes
	140	14.0	115	45	47	47	Yes
	190	19.0	155	49	51	50	
	215	21.5	176	51	52	52	

NOTES:

- For Airtec blocks, the aerated concrete mass law calculation is used.
- For non-aerated blocks, the mass law calculation in BS 8233 is used.
- An equilibrium moisture content for internal walls of 3% is used when calculating the wall mass.

Air Tightness

In Part L 2021, the requirement is for all new build properties to be tested for air-tightness; a sampling approach is no longer allowed.

Masonry block walls using any type of Thomas Armstrong concrete block have been shown to easily achieve these figures provided that high standards of workmanship during the build are maintained. Figures of around 5 $m^3/hr/m^2$ or less are commonplace and routinely achieved in practice.

Part L 2021 requirements for air permeability	Notional (nominal) Value	Limiting (backstop) Value
	5.0 $m^3/hr/m^2$	8.0 $m^3/hr/m^2$

Air Permeability of Our Blocks
Blocks tested at 50 pascals; units in $m^3/hr/m^2$

Block Type	100mm	140mm
Insulite Premier (unfinished)	2.67	2.17
Insulite Standard (unfinished)	2.37	1.76
Insulite Standard (painted)	< 0.16	< 0.23
Dense Standard (unfinished)	3.18	3.64
Dense Standard (painted)	0.49	0.73
Airtec Standard (unfinished)	0.22	0.26
Airtec Standard (painted)	< 0.1	< 0.1

In practice, good air tightness of a building comes down to good workmanship and site practice as much as the building materials used.

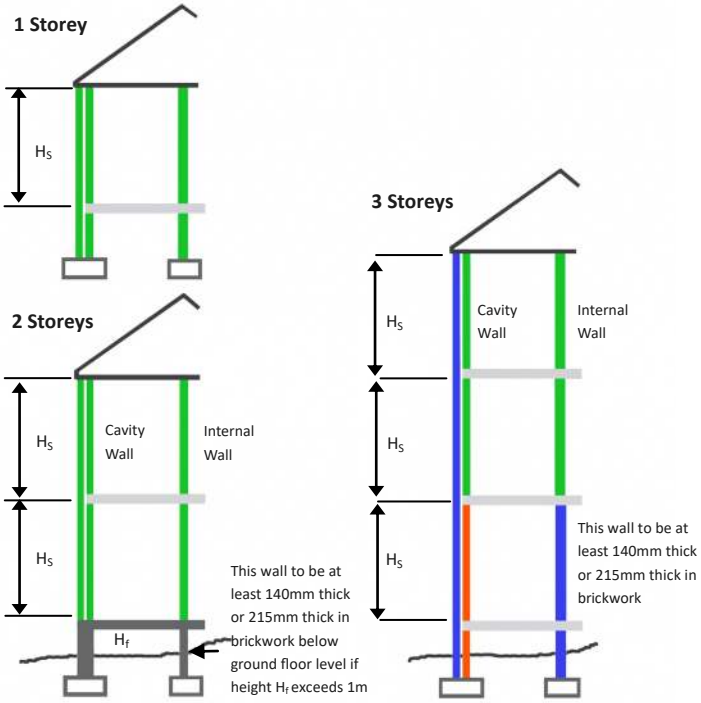
A parge coat on the internal faces can contribute to exceptionally low air permeability figures of 2.0 or less helping to achieve Passivhaus or similar requirements. However, the designer has to be aware that the air quality may deteriorate posing health risks for occupants and mechanical ventilation systems may have to be employed to avoid condensation and associated risks.

Structural

All of the products in our range are suitable for use in meeting the UK structural Building Regulations and codes currently in use:

- **Approved Document A of the Building Regulations**
- **BS 5628 (Code of Practice for Use of Masonry)**
- **BS EN 1996-1 (aka "Eurocode 6")**
- **BS 8103 (Structural Design of Low Rise Buildings)**

The following rules of thumb for selecting block strength to storey height is taken from Approved Document A of the Building Regulations England & Wales:



Aggregate & Aerated Concrete Masonry Unit Strength to BS EN 771-3 & 771-4

	Condition A	Block Strength at least 2.9 N/mm^2
	Condition B	Block Strength at least 7.3 N/mm^2
	Condition C	Block Strength at least 7.3 N/mm^2
	Where H_f is less than or equal to 1m, Condition A Where H_f is greater than 1m, Condition B	

Notes

1. If H_S is not greater than 2.7m, the compressive strength of bricks or blocks should be used as indicated in the 'key' table above.

2. If H_S is greater than 2.7m, the compressive strength of bricks or blocks used in the wall should be at least Condition B, or as indicated by the key, whichever is the greater.

3. If the external wall is solid construction, the masonry units should have a compressive strength of at least that shown for the internal leaf of a cavity wall in the same position.

4. The guidance given in the diagram for walls for 2 & 3 storey buildings should only be used to determine the compressive strength of masonry units where the roof construction is of timber.

Characteristic Compressive Strength, f_k

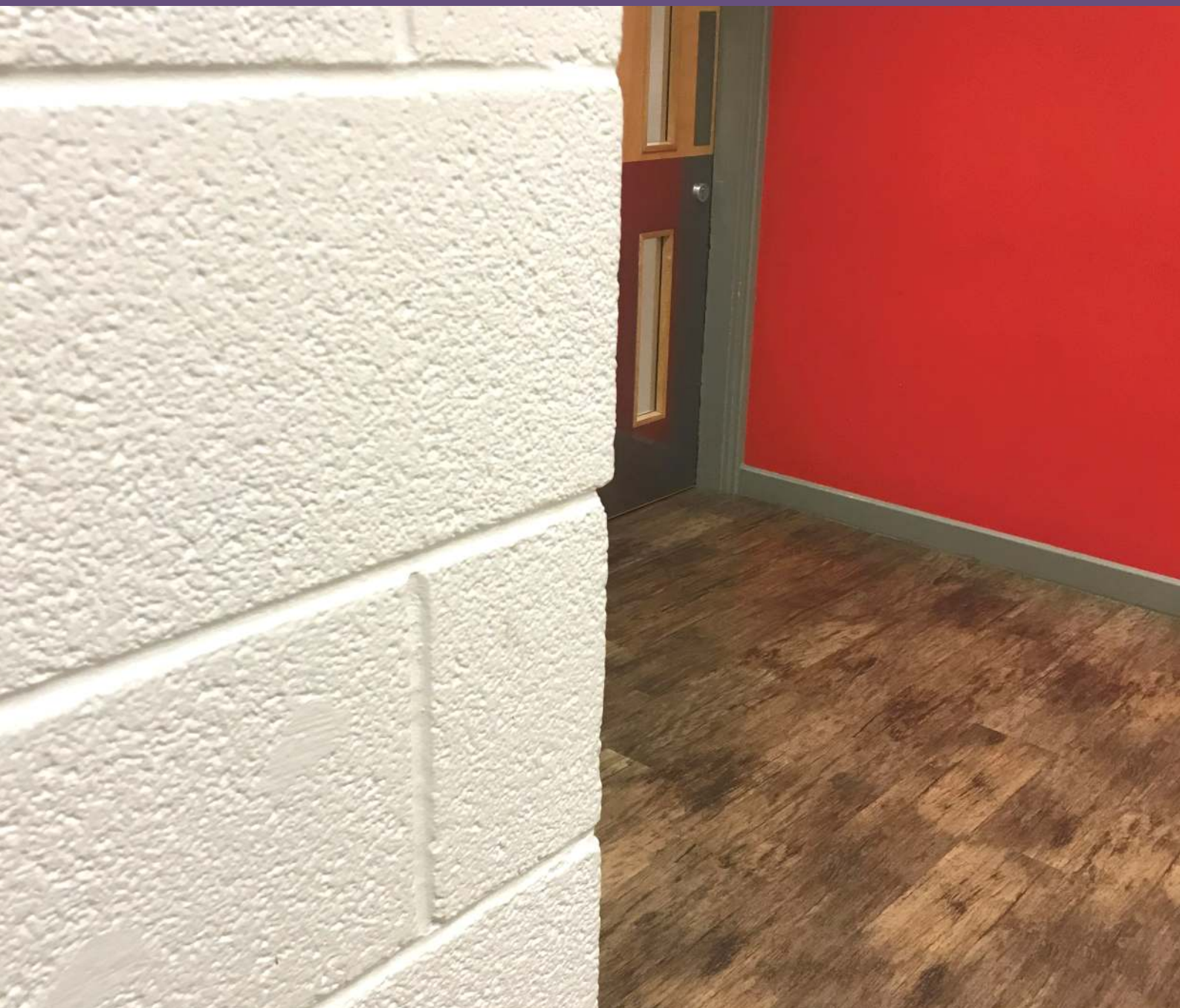
Selected aggregate block types using Designation iii (M4) general purpose mortar :

	Mean Compressive Strength of Block, N/mm²				
Block Size	**2.9**	**3.6**	**7.3**	**10.4**	**15.0**
Solid (Group 1) blocks					
100mm	3.0	3.5	5.7	7.3	9.5
140mm	2.9	3.3	5.5	7.0	9.1
Cellular/Hollow (Group 2) blocks					
100mm	2.8	3.3	5.3	6.8	8.8
140mm	2.7	3.1	5.1	6.6	8.5
215mm	2.5	2.9	4.7	6.1	7.8
Blocks laid flat to form a 215mm thick wall					
100mm	2.0	2.4	3.9	5.0	6.4

Other Physical Properties of our blocks (all types)

- Coefficient of linear expansion:
  8×10^{-6} K
- Specific Heat Capacity:
  1.05 kJ / kg / K

Design & Detailing



Foundations & Below dpc

Our range of concrete blocks are resilient and durable products most of which are perfectly suitable for use below dpc and as solid or cavity foundation wall blocks. They are resilient to frost attack in the absence of mobile groundwater and are suitable for use in most soil conditions encountered in the UK. Use of blocks below ground should be carried out in accordance with the recommendations contained in BS 5628 - Part 3 and BS EN 1996.

Criteria for suitability for use below ground

The following block types are suitable for use below dpc in soil conditions up to DS-3 as defined in BRE Special Digest 1:

- Airtec Seven (Airtec Standard up to DS-2 only)
- Ultralite blocks of 7.3 N/mm² compressive strength or above
- Insulite blocks of 7.3 N/mm² compressive strength or above
- Dense Concrete blocks of any strength

Not suitable for use below dpc:

- Airtec XL 2.9N/mm² aerated blocks
- Ultralite, Insulite blocks of less than 7.3N/mm²

The presence of mobile water regularly peculating through the blocks can lead to eventual deterioration of the blocks and must be avoided.

Height of foundation walls

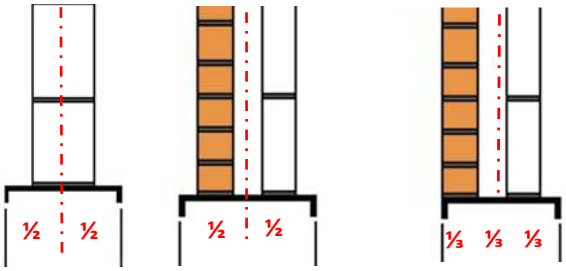
Approved Document A of the Building Regulations suggests that blockwork below dpc may be built to a maximum height of 2.7m provided that the wall is restrained at ground floor level and both sides of the wall is backfilled at the same time to ensure stability. If the wall below dpc is greater than 1m height, the block strength should be at least 7.3N/mm².

Sulphate Soil Conditions

Current building practice is such that wherever masonry is used below ground level it is usually limited to the top 1 meter depth. At the same time, sulphate levels in the top 1 meter of UK soils are rarely more severe than class DS-1. It follows that the depth at which samples are taken to enable the sulphate soil classification to be determined should be indicative of the depth where the masonry is being used. BRE Special Digest 1 draws attention to this.

Research by the BRE and the Concrete Block Association has shown that surface carbonation of aggregate blocks enhances their sulphate resistance, the requirement being that blocks are surface carbonated for a minimum of 10 days. Such exposure to air and surface carbonation will always take place without any special provisions between the time of manufacture of the block and back-filling after construction.

Positioning of walls on solid foundation blocks



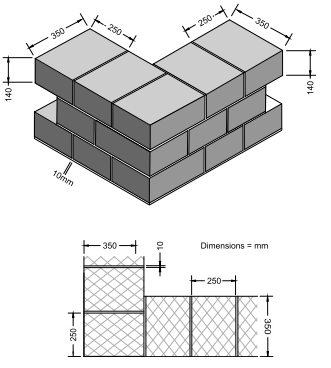
In general, walls should be positioned so that the vertical centre line of the wall aligns with the vertical centre line of the foundation wall as shown on the diagram above.

Where the external face of the wall is at or near to the edge of the foundation block, it is sufficient to ensure that the vertical centre line of the wall is within the middle third of the foundation width.

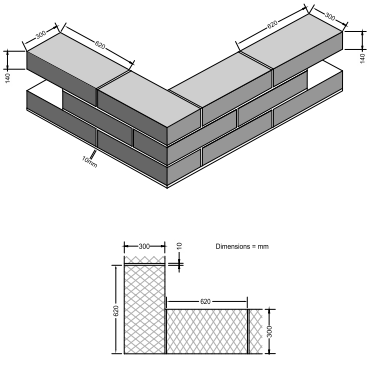
Bonding of foundation blocks

Blockwork is normally built in stretcher bond with the vertical joints in successive courses overlapping the preceding one. A regular bond pattern should be maintained with a minimum overlap of 0.4 x the height of the block recommended in BS EN 1996-1-1.

- For 215mm high blocks this equates to an 86mm overlap.
- For 140mm high blocks this equates to a 56mm overlap.



Example corner detail: 350 x 250 Armstart aggregate foundation block



Example corner detail: 620 x 300 Airtec aerated foundation block

Floors

Suspended block & beam floors are the most popular, simple and cost-effective form of ground floor construction in the UK. We offer a complete range of concrete blocks, bricks and slip blocks for use in suspended block & beam floors including Part E and Robust Standard Detail acoustic separating floors.

Block & beam floors possess a number of distinct advantages over other forms of floor construction:

- Exactly the same blocks may be used for walls and floors therefore simplifying the build process.
- Long spans are readily achieved without intermediate support resulting in cost-savings and a quicker build.
- Requirements for thermal, acoustic and fire resistance are easily achieved.
- A proven and reliable construction technique which eliminates the effects of ground heave or shrinkage.
- A versatile method which may be used for ground floors and intermediate floors. A safe method; once installed, the floor may be used as a working platform.

Specification of blocks suitable for use in floors

Insulite and Dense Concrete blocks:

Solid (Group 1) Insulite or Dense Concrete wall blocks of nominal dimensions 440mm x 100mm x 215mm with a compressive strength of 7.3 N//mm² or above (when tested in normal block-laying aspect).

Dimensional tolerance category D1: +3mm / -5mm on all dimensions

Airtec aerated blocks:

Airtec Large Format blocks with dimensions 620mm x 100mm x 430mm, Airtec Seven 7.3 N/mm² blocks with dimensions 620mm x 100mm x 215mm, are suitable for use as infill blocks for block & beam flooring.

The following block types are not suitable for use as block & beam floor infill:

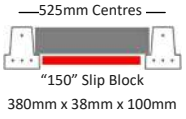
- Ultralite blocks of any strength
- Insulite or Dense Concrete blocks of less than 7.3 N/mm² compressive strength
- Cellular or Hollow Concrete blocks
- Airtec XL 2.9N, Airtec Standard 3.6N or Airtec Party Wall blocks

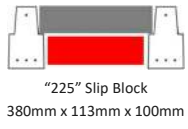
Our Range of Special Floor Products

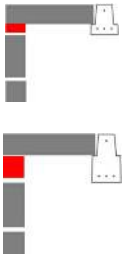
We offer a number of coursing and infill blocks to suit most standard 150mm and 225 deep T-beams. The diagrams below show sections for blocks laid 440mm wide and 215mm wide.

See page 18 for further details on our Special Products.

Slip Blocks / Split Course Blocks







Slip blocks used to maintain coursing height on adjoining masonry wall for 150mm and 225mm high T-beams.

Rebated Infill Closure Blocks

We offer a range of rebated closure blocks for use at the ends of a block and beam floor to maintain airtightness, acoustic insulation and avoid thermal bridging problems.

Laying of Flooring Blocks

Flooring blocks are defined as NR (non-resisting) and do not perform a significant mechanical function to the overall structural strength of the floor. The beams themselves provide the structural strength of the floor system. The infill blocks simply provide a base for the application of subsequent screed and insulation layers.

For this reason, during the laying phase blocks must not be stood on or subjected to impact or point-loading in their laid-flat state. Walking boards must be used across the beams to provide a safe working platform whilst working on the floor. The floor will only achieve full strength and integrity once the blocks are grouted into place and the subsequent layers applied.

Wall Types

Our extensive range of blocks offer solutions for all types of masonry walls, from internal partition walls to high performance acoustic separating party walls compliant with Part E of the Building Regulations and Robust Standard Detail walls.

There are a number of basic rules of thumb to follow when constructing various wall types which are outlined here.

Internal Walls & Partitions

Any block from our range is suitable for the construction of internal partition walls and will provide a durable and robust building.

All blocks within our range are non-combustible and are categorised as Class A1 fire resistance in accordance with the very latest standards and will provide fire-resistant internal walls.

Separating Party Walls

We recommend the use of solid blocks for use in party walls although cellular blocks may be used as long as pre-completion acoustic testing is carried out. If using Robust Standard Detail party walls however, only solid blocks may be used.

Party walls should always be constructed without vertical movement joints. Movement can be accommodated by the use of horizontal bed-joint reinforcement across the length of the entire wall at every other course.

Party walls should not be chased and only approved Part E or Robust Detail wall ties should be used.

See the 'Acoustic' section for further details.

External Walls

All blocks within our range can be used for external walls. They are not suitable to be left unfinished and exposed to the weather as they are not fully resistant to moisture. Repeated freeze-thaw cycling will lead to long-term damage. Therefore, external walls should be fully protected from exposure by weatherproof rendering or cladding.

If blocks are to be left unfinished on an externally exposed wall, we recommend the use of 215mm Hollow concrete blocks filled with concrete which will provide better resistance to rain penetration than thinner, solid blocks. This is commonplace in agricultural buildings for example.

To aid resistance to moisture ingress, all mortar joints must be fully filled and preferably tooled. Un-tooled and recessed mortar joints are more susceptible to rain penetration.

Solid Walls

Blocks can be laid flat (i.e. a 215mm thick wall) to form a high-mass solid wall without any deterioration in strength. Airtec blocks should not be laid flat and should only be used in their intended orientation to achieve their full compressive strength. Airtec blocks are available in 190mm and 215mm thickness for solid wall construction.

Solid walls can be used for internal walls, party walls and are particularly effective when used for externally insulated (EWI) solid walls also known as Super-insulated Masonry (SIM) walls.

SIM walls can eliminate cold bridging entirely, have zero interstitial condensation risk, provide a completely watertight barrier and can achieve exceptionally low u-values using only 2 main layers.

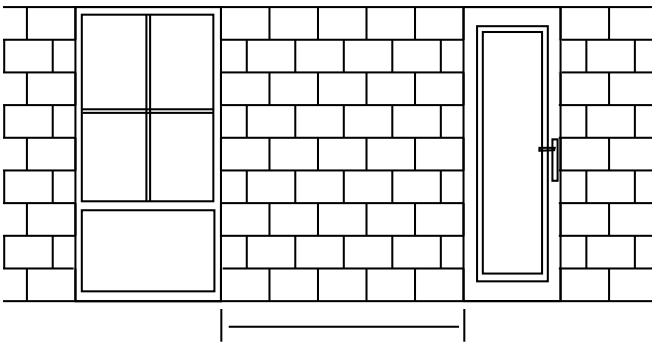
Movement Control & Wall Ties

Vertical Movement Joints

Concrete blocks are subject to movement as they age and dry out. These products shrink as they age. Movement joints are particularly suitable at the interfaces between dissimilar materials; at intersecting walls for example. For acoustic party walls, vertical movement joints should never be used.

Wherever possible, blockwork should be designed as a series of 'panels' separated by movement joints. Generally length should not exceed 3 x height of the panel, except where bedjoint reinforcement is incorporated.

Care must be taken when introducing wide window openings as the blockwork immediately above and below may exceed the 3 to 1 length/height ratio. Where possible storey height openings should be designed, forming the masonry into discrete panels without interfering with the overall design aspect. (See diagram below).



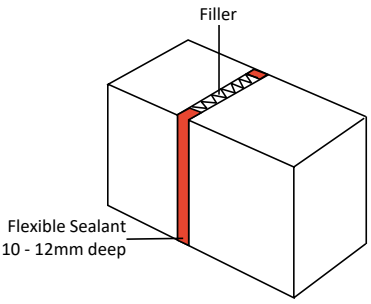
Not to exceed recommended maximum length/height ratio

General Guidelines for Vertical Movement Joints:

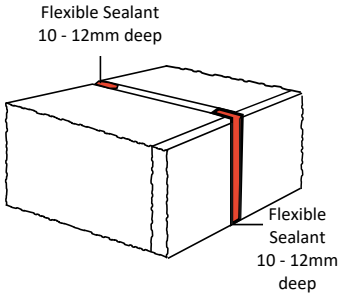
- Dense Concrete block walls should be divided into approximately 7-9m long panels for internal and external walls.
- For Airtec, Ultralite and Insulite block walls, the panels should be no longer than 6m in length whether internal or external.
- Each panel should be separated by a suitable vertical movement joint placed in an unobtrusive location.
- The first movement joint should not be more than 3m distance from the end of the wall or an internal / external corner or angle.
- Movement joints should wherever possible carry up the full height of the wall and avoid passing through openings.
- The adverse effects of movement can be minimised by protecting the blockwork from the extremes of moisture during and after construction.
- Overly strong mortars should be avoided to reduce the effect of movement and to prevent the blocks from cracking. This is especially important for Airtec block walls.
- Additional wall ties should be placed within 150mm of either side of the movement joint at every block course up the length of the joint.
- Movement joint should not pass through openings due to the difficulty in continuing the joint between the frames and masonry and around the ends of the lintels.

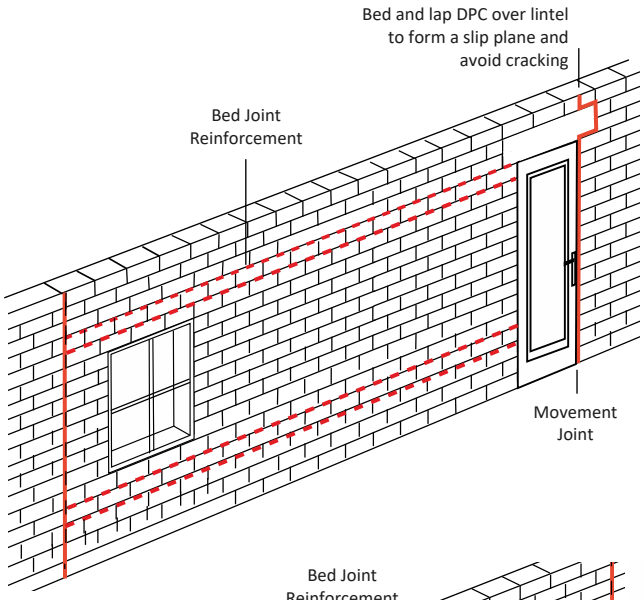
Movement joints can be formed by butting the block up against a 10mm strip of pre-compressed filler which is able to expand as the blocks dry and shrink.

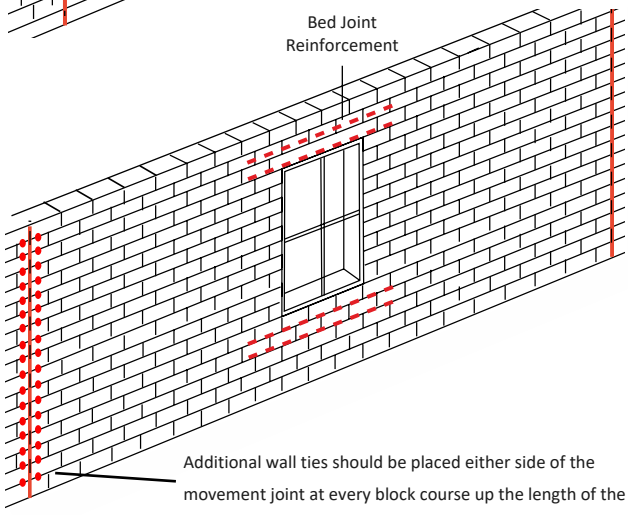
Flexible sealing is required on both faces, placed at least 10mm deep to ensure a good bond to the blockwork. The sealant should not bond to the filler. Stop beads should be used at the ends of the joint.



Movement joints should be carried through external the render layer if used and formed using stainless steel render stop beads.







Additional wall ties should be placed either side of the movement joint at every block course up the length of the joint and within 150mm of the joint.

Horizontal Movement Control

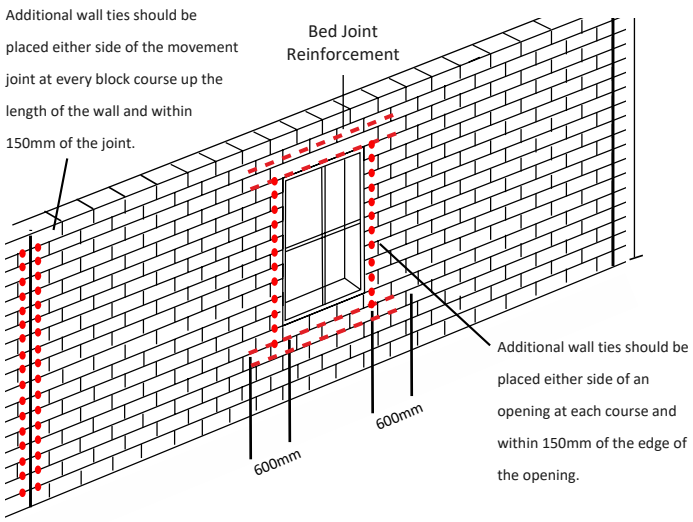
Bed joint reinforcement is particularly suitable for houses and low-rise dwellings wherever a vertical movement joint is impractical and for acoustic separating party walls where vertical movement joints are prohibited.

Horizontal movement control can be in the form of steel ladder-type mesh or flexible movement control mesh (particularly designed for use with Airtec thin-joint mortar construction).

Horizontal movement control is particularly effective at relieving stresses around areas of point loading such as joists and lintels as well as above and below openings such as doors and windows.

General Guidelines for horizontal movement control:

- Horizontal movement control should be placed in the 2 courses above and below any opening and below any area of higher stress such as lintels and floor joists.
- The reinforcement should extend at least 600mm beyond the width of the opening into adjacent blockwork. (See diagram below).
- Ideally, the reinforcement should be of a suitable length so that any stresses are transmitted to vertical movement joints or adjacent areas of blockwork.
- Reinforcement should normally have a mortar cover of at least 13mm on the face of the internal blockwork and 25mm on the external blockwork faces.
- Where a wall is supported by a floor, the first two courses above the floor junction should be bed-joint reinforced.
- Masonry grade reinforcement should be used. Plastering grades are not suitable.
- Reinforcement must never bridge a vertical movement joint.
- A piece of dpc placed immediately below lintel bearings and joists will provide a slip plane and additional protection from cracking in these areas of higher stress.



Wall Ties

Wall ties should be flexible enough to accommodate the relative movement between both leaves of a cavity wall and stiff enough to transmit axial loads. Selection of ties should be in accordance with BS EN 845-1.

General Guidelines for Wall Ties:

- For conventional 10mm mortar construction, butterfly or double triangle type stainless steel wall ties should be embedded at least 50mm into the mortar joint on each leaf.
- When using partial-fill internal cavity insulation, suitable retaining devices should be used to support the cavity insulation batts in position.
- The leaves should be coursed so that the ties slope slightly down towards the outer leaf and the drip is facing downwards in order to prevent water penetration across the cavity to the inner leaf.

Wall Tie Spacing and Positioning

- Wall tie spacing and positioning should be in accordance with the table below with a minimum tie density of 2.5 ties per m² of wall.
- Ties should be evenly distributed over the entire wall area using a staggered pattern when both leaves are greater than 90mm thick.
- The distance from a vertical movement joint or the vertical edge of any opening (e.g. door, window) should be no greater than 150mm (see diagram opposite).

Leaf Thickness mm	Cavity Width mm	Horizontal Spacing	Vertical Spacing	Ties per m²
Less than 90mm	50 – 75	450 mm	450 mm	4.9
Over 90mm	50 - 150	900 mm	450 mm	2.5

Site Work

Storage and Laying of Blocks

Storage of Blocks

General Good Practice for Site Storage of Blocks

- We can deliver on a variety of vehicles from 6-wheeler rigid wagons to articulated crane and flat vehicles. Always be sure to check that the site can safely accommodate the vehicle type requested.
- Minimise repeated handling and lessen the potential for damage to product by storing in positions as near to the point of use as possible.
- Packs may vary in size and quantity depending on where they are manufactured and may or may not be delivered on wooden pallets.
- Some of our factories can supply voided packs for handling with forks without the need for a wooden pallet.
- Always check load and pack details with your sales office to ensure that the site is equipped with the correct offloading and handling equipment.
- Blocks must be protected from the weather by waterproof sheeting to preserve their quality whether they be unused or walled blocks.

Safety & Manual Handling

- Packs should be stored on firm, level ground no more than 2 packs high.
- Packs are banded and care must be taken when removing these bands as individual blocks may fall out. Never un-band packs above shoulder height.
- In the absence of a revised version of the HSE guidance given in their withdrawn Construction Sheet 37 'Handling Building Blocks' the following principles should be followed: There is a risk of injury in the repetitive handling of blocks heavier than 20kg. Repetitive manual handling of blocks over 20kg should be subject to a risk assessment and a safe system of work should be established before block-laying commences.
- Load units out to above knee height.
- When cutting, drilling or chasing blocks, ensure that suitable eye protection is worn and if using mechanical cutting, suitable dust suppression and extraction measures should be provided on site.
- Never stand on flooring blocks laid flat in suspended beam & block floors. *See page 30 for further details.*

Void packs are available for fork-truck handling without the need for wooden pallets

Block Laying

General Good Practice for block laying

- Blocks should not be laid if the temperature is at or below 3°C and falling unless it is at 1°C and rising.
- Remove all dirt and debris from the block surfaces.
- Blocks should always be laid on a full bed of mortar and the vertical perpend joints filled.
- There is no need to wet the blocks before applying mortar. The consistency of the mortar mix should be adjusted to suit the suction of the block. A slightly thinner mortar suits Airtec blocks whose suction is higher than that of an Ultralite, Insulite or Dense Concrete block.
- When building cavity walls, both leaves should be brought up together. However, if constructing using Airtec with thin-joint mortar, the inner leaf can be built ahead of the outer leaf for external cavity walls.
- Unrestrained , untied single-leaf walls must be suitably propped up and supported to avoid collapse in high winds during construction.

Block Bonding

Blocks should be laid to achieve a good bond normally not less than one quarter of the length of the block. Other patterns may require the inclusion of bed joint reinforcement.

Protection of Finished Blockwork

Blockwork which remains unfinished and exposed must be protected from the weather with suitable sheeting which must be properly tied down. Care must be taken to cover all of the newly laid blockwork particularly if there is any possibility of extreme hot or cold weather. If blocks remain wet in frosty or freezing conditions there is the possibility of damage through repeated freeze-thaw cycling. Unused blocks stored for prolonged periods must be protected. If untied single-leaf walls are exposed to high winds, they must be adequately supported and propped to prevent accidental collapse.

Chasing

Vertical chasing should be restricted to ⅓ the depth of the block thickness and for horizontal chasing, ⅙ the depth of the block. Chasing is not permitted in acoustic separating party walls and always avoid ‘back to back’ chases in any type of wall.

Efflorescence

Efflorescence on concrete blocks takes the form of a white crystalline deposit on the block surface and is caused by natural water soluble salts drying out on the surface. This is a completely natural and harmless effect than can occur when concrete blocks are left exposed. These effects diminish over time as the soluble salts are washed away. Efflorescence is more common in the winter months.

Dry surface deposits can be removed using a stiff brush and then any residues washed away with clean water preferably under pressure. Prevention of moisture ingress into the blockwork will minimise efflorescence occurring.

Mortars & External Renders

Mortars

Airtec, Ultralite, Insulite and Dense Concrete block surfaces offer an excellent substrate for accepting mortars provided that the block surfaces are clean and free of dust and debris. Generally in order to avoid unsightly cracking, the weakest mortar mixture appropriate to the structural requirements should be selected as per BS EN 1996-1-1. For most applications above dpc, we recommend that a Class iii (M4) designation mortar is used.

There is no need to wet the blocks before applying mortar. The consistency of the mortar mix should be adjusted to suit the suction of the block. For example, a slightly thinner mortar mix would suit Airtec blocks whose suction is higher than that of an Ultralite, Insulite or Dense Concrete block. A slightly weaker mortar mix should always be used with Airtec blocks.

The following table shows the recommended mortar mixes for our blocks. These recommendations are for general guidance only and consideration of exposure conditions must always be taken into account where stronger mixes may be more appropriate. Further details can be found on Table 15 of PD 6697.

	Mortar Class EN 1996-1-1	Recommended Mix Proportions of materials by volume (as per BS EN 998-2)	
Above DPC	(iii) M4	1 : 1 : 5½ 1 : 5½ 1 : 4½ 1 : 3½ to 4	Cement : Lime : Sand Cement : Sand Masonry Cement : Sand (with non-lime filler) Masonry Cement : Sand (with lime filler)
Below DPC	(ii) M6	1 : ½ : 4 to 4½ 1 : 3½ 1 : 3 1 : 3½ to 4	Cement : Lime : Sand Cement : Sand Masonry Cement : Sand (with non-lime filler) Masonry Cement : Sand (with lime filler)
Airtec aerated blocks: Use a weaker Class (iii) M4 mix, e.g. 1 : 1 : 6 Cement : Lime : Sand			

Important note:
In the case of building a brick outer leaf and Airtec block inner leaf where one material demands a stronger mix than the other, great care should be taken not to use the same mix on both leaves thus compromising one of the leaves!

Thin Joint Mortar for Airtec Blocks

Airtec aerated block walls can be constructed using either conventional 10mm mortar joints with mixes as shown in the table above, or using 2mm Thin Joint mortar.

Thin Joint mortar is widely available in the form of 25kg bags of dry, pre-mixed powder. Mixing is simply done by adding water to the powder according to the instructions on the bag and if made correctly and applied with the correct tools, will ensure that the correct mortar strength is achieved for use with aerated blocks.

Further details of Thin Joint construction can be found on our website and in our Thin Joint brochure which is available to download from www.thomasarmstrongconcreteblocks.co.uk

External Rendering

Blocks of any type or grade are not waterproof or weatherproof and must be rendered or cladded if used on an external leaf.

Traditional renders should be applied in 2 coats. The first coat should not exceed 15mm thickness and the second coat should be 5-7mm. The first coat should be slightly stronger than the second coat. Render designation M4/iii should be used. Recommended proportions are:

Cement : Lime : Sand with or without air entrainment	Cement : Sand with or without air entrainment	Masonry Cement : Sand with cement filler other than lime	Masonry Cement : Sand with lime cement filler
1 : 1 : 5 or 6	1 : 5 or 6	1 : 4 or 5	1 : 3½ to 4

Good Practice for Applying External Renders

- Preparation of the background should be carried out depending on block type - see opposite for details.
- Clean all dirt and debris from the block surfaces.
- Rake back mortar joints to provide an additional mechanical key, particularly if using closer textured blocks. Mortar joints should be left rough and not struck off or tooled.
- Movement joints in the background blockwork should be carried through the render and be formed using stainless steel stop beads.
- Provision should be made for external fixings, brackets and supports prior to commencing rendering work.
- Corner beads and stop beads suitable for external work should be used.
- Cement, lime, sand mixes without air entrainment are preferred.
- Sands in accordance with BS EN 13139 should be used. Sands that are too fine tend to have high water demand.
- Mixes should be accurately gauged, the ingredients being thoroughly mixed before adding the water. The minimum amount of water required to provide a workable mix should be used.
- Design detailing should ensure that there are good overhangs at eaves, sills and other projections in order to throw rain away from walls (e.g. bellcasts).
- Rendering must not bridge the dpc.
- A wavy 'serpentine' scratch pattern on the first coat of render is known to be beneficial for aerated block walls and help reduce hairline shrinkage cracks. This method also relies on correct movement control built into the wall.
- If full reinforcement mesh is not been used throughout, ensure that mesh is applied to higher-stress vulnerable areas such as around openings, sills, doors, windows.

Weather Conditions

The bonding and durability of rendered finishes is affected by the weather conditions at the time of application.

In hot weather or where the wind can dry out the render too quickly, the applied render should be kept damp for the first 3 days with the use of protective sheeting.

The same protection is needed from driving rain and freezing conditions. Where sheets are used, ensure that they are hung so as not to contact the applied render and cause chafing and scuffing.

Pretreatment of walls using close-textured blocks
(Airtec, Premier Insulite & Dense Paint Grade blocks)

These blocks have a close texture and therefore have less mechanical key for the render to adhere to than a Standard texture block. The following steps can assure render adhesion even on the smoothest surfaces.

Pre-treatments or raking back mortar joints are advised on closer textured blocks. Aggregate blocks need not be wetted prior to the application of coatings whereas Airtec blocks can be lightly wetted prior to applying renders in dry, warm conditions to overcome their natural suction and prevent the render from drying out too quickly. Proprietary pre-rendering treatments such as Rend-Aid can be applied if desired.

Block Type	Background pre-treatment	Number of rendering coats
Ultralite, Insulite & Dense Standard	None	2
Insulite Premier	Stipple or spatterdash coat	2 + pre-treatment
Dense Paint Grade	Stipple or spatterdash coat	2 + pre-treatment
Airtec	Wet, stipple or spatterdash coat	2 + pre-treatment

Stipple coat: A stipple coat mix should be prepared using one part of cement with one and a half parts of sharp sand made into a consistency of a slurry with water and a bonding agent such as styrene butadiene rubber (SBR). The mixture should be pushed into the surface with a coarse brush and then dabbed with a re-filled brush to give a coarse finish which should be protected from rapid drying out for a day and then left for an addition day or two to harden before applying the first render coat.

Spatterdash coat: A spatterdash coat mix should be prepared using one part of cement to 2 parts of coarse sand with just sufficient water containing a bonding agent such as styrene butadiene rubber (SBR) to form a thick slurry. The spatterdash should be thrown against the background with a small scoop to form a layer of 3-5mm thickness. The mix should be stirred regularly to prevent settlement. The spatterdash layer should be protected from rapid drying out for a day and then left for an additional day or two to harden before applying the first render coat.

Proprietary one & two-coat Render Systems

For proprietary render products, the manufacturer's literature should be consulted for base coat and final coat recommended thicknesses.

Proprietary single coat renders should be used with caution. These often work well but on occasion single coat proprietary renders can fail as their strength is not suitable to the blockwork background. Too strong a mix can result in crazing and cracking. We strongly recommend that the render manufacturer is contacted to establish:

a). Is there is any history of problems with their product on masonry?

b). The exact preparation and application guidance recommendations?

c). Is the product strength no greater than the blocks and can they supply a lower-strength product to suit the blocks if necessary?

d). Is a key-coat, suction-control coat or finishing sealer required?

Internal Finishes

Plasters

Airtec, Ultralite, Insulite and Dense Concrete blocks provide an excellent background for accepting plasters. Cement, lime, sand plasters provide a tough surface against impact damage and enhanced sound insulation. To obtain a smooth finish, the final coat should be gypsum plaster because a cement, lime, sand mix does not generally provide a smooth enough finish coat. Before applying the plaster, the block surfaces must be cleaned and free of dust and debris. Adhesion can also be improved by raking back mortar joints to provide an additional mechanical key. For closer-textured blocks, a proprietary bonding agent can be used if desired.

	Base Coat Cement: lime: plastering sand	**Finish Coat**	**Notes**
Dense Plaster	1:2:9 1:1:6 Approx 10mm thick	A skim coat of gypsum plaster Approx 3mm thick	Avoid rapid drying out of base coat
Light-weight Plaster	Proprietary gypsum plasters requiring only the addition of water for both base and finish coats are available. Manufacturer's instructions must be strictly followed.		Never mix Portland cement and gypsum plaster.

Drylining

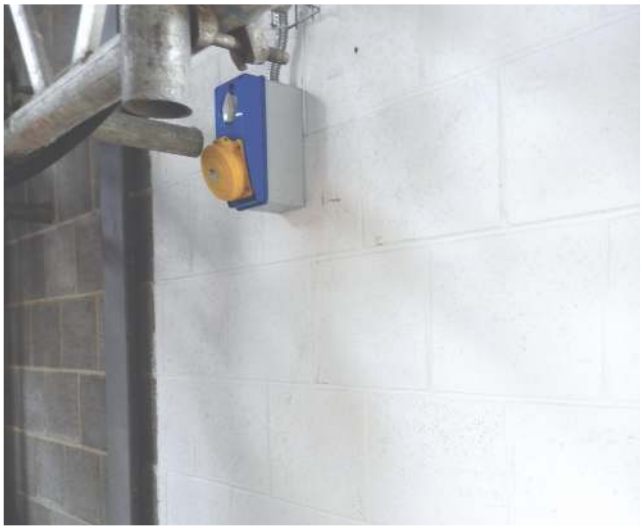
Standard plasterboard and thermal laminate drylining boards can be applied directly to blockwork using dabs or other proprietary adhesive. The adhesive manufacturer's instructions and recommendations should always be followed to ensure correct adhesion.

Painting

Insulite Premier and Dense Paint-Grade blocks can be painted directly. Standard internal water based emulsions can be used although masonry paints offer better durability, flexibility and breathability. Standard texture blocks and Airtec blocks will accept paint but will not result in a smooth, paint-grade finish.

Newly built walls will be slightly damp and should be left to dry out before applying paint. Some general good practice points for painting are:

- Surfaces should be clean and free of dust and debris.
- Masonry paints (e.g. Pliolite-based) are the preferred option whose breathability and durability are better suited to blocks than standard internal emulsion paints.
- The first coat can be thinner (no more than 10%) and left to dry. The use of heavily watered-down mist coats is not recommended as this can introduce extra moisture into the blockwork and cause additional drying shrinkage issues. The final coat should be normal thickness.



Tiling

A 1 : 5 cement : sand render mix applied in 2 coats with a final scratched surface provides a suitable and strong background to adhere tiles to. No special preparation of the standard-texture block surfaces is required before applying the render although for close-textured surfaces, pretreatment of walls may be necessary (see previous page). The cement : sand render should be left to dry out for around 2 weeks before applying the tiles.

Fixings

Fixings can be used on all of our products wherever they be solid, cellular or hollow. However, considerations should be given to the use of solid blocks wherever heavy-duty fixings are required. Ultralite, Insulite and Dense blocks have good pullout strength and provide good grip using common expanding wall plugs. For Airtec blocks, fixings designed especially for use with aerated concrete blocks should always be used.

The following table shows a selection of block types vs application and suitable fixings from Fischer and Hilti. There are other fixing manufacturers available whose equivalent products would be suitable. Please contact our Technical Department for information.

General Good Practice Points for Fixings

- For heavy duty applications involving potential loading and vibration cycles, substitute any hollow blocks for solid blocks in the specific areas prone to high stresses.
- Avoid placing the fixing within 50mm of the edge or top of the wall wherever possible.
- Avoid fixing into mortar joints. If using chemical resin anchors, always follow the manufacturer's instructions.
- For Airtec aerated blocks, drill holes using HSS drill bits on a steady constant speed without hammer-action. Masonry drill bits are not recommended for Airtec blocks.

Block Type	Light-duty Applications	Medium-duty Applications	Heavy-duty Applications
Airtec (all grades)	Fischer : SXS / SXR / UX Nylon Plugs Hilti :HRD	Fischer : GB Anchor / Turbo Anchor Hilti : HLC	Fischer : PBB Resin (FIS V360) Anchor System Hilti : HY 70 Resin Anchor System
Ultralite 7.3 N	Fischer : SXS / SXR / UX Nylon Plugs with wood screws Hilti :HRD	Fischer : SXR / FUR with Fischer safety screws Hilti : HLC / HRD	Fischer : FIS V360s with M8 Studs Hilti : HY 70 Resin Anchor System
Insulite 7.3 N	Fischer : SXS / SXR / UX Nylon Plugs with wood screws Hilti :HRD	Fischer : SXR / FUR with Fischer safety screws Hilti : HLC / HRD	Fischer : FIS V360s with M8 Studs Hilti : HY 70 Resin Anchor System
Solid Dense 7.3 N	Fischer : SXS / SXR / UX Nylon Plugs with wood screws Hilti :HRD	Fischer : SXR / FUR with Fischer safety screws Hilti : HLC / HRD	Fischer : FIS V360s with M8 Studs Hilti : HY 70 Resin Anchor System
Solid Dense 10.4 N +	Fischer : SXS / SXR / UX Nylon Plugs with wood screws Hilti :HRD	Fischer : SXR / FUR with Fischer safety screws Hilti : HLC / HRD	Fischer : FIS V360s with M8 Studs Hilti : HY 70 Resin Anchor System
Cellular Dense 7.3 N	Fischer : SXS / UX Nylon Plugs Hilti :HRD	Fischer : FUR with Fischer safety screws Hilti : HRD	Fischer : FIS V360s with M8 Studs and Sieve Hilti : HY 70 Resin Anchor System

Download the DeWalt Fixing Guide from our website which details the best fixing for each of our block types.

Light-Duty Fixings

Standard plastic plugs and screws are perfectly acceptable for most light-duty applications such as fixing shelves and standard wall units. For Airtec blocks non-expandable fixings designed especially for aerated concrete blocks must be used.

Medium-Duty Fixings

Plastic plug and screws are perfectly acceptable for most medium-duty applications such as fixing kitchen units, frame fixing and external fixings. For Airtec blocks fixings designed especially for aerated concrete blocks must be used.

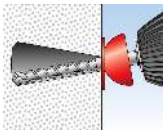
Airtec aerated concrete blocks

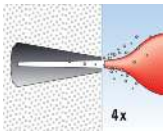
Due to the cellular structure of Airtec aerated blocks, fixings specifically designed for use with aerated concrete blocks must be used.

Standard expandable wall plugs are not suitable for use with Airtec blocks.

Heavy Duty Fixings

Wherever heavy-duty fixings are required, solid Dense concrete blocks should be considered where possible. However, resin anchor systems will satisfy heavy-duty requirements for all of our block types and provide excellent, irreversible anchorage. Expanding anchors are not recommended for heavy-duty applications.





Useful Information

Health & Safety

DESCRIPTION:	Lightweight aggregate, dense concrete and autoclaved aerated (Airtec) building blocks for walls, foundations and flooring applications manufactured in various grades of strength and density and a range of sizes for use in the construction industry.
COMPOSITION:	Ultralite: Cement, expanded clay aggregate, pumice Insulite: Cement, Furnace Bottom Ash, Glass Sand, Limestone. Dense: Cement, Class 2 natural aggregates, Glass Sand Airtec: Cement, Lime, Pulverised Fuel Ash, Anhydrite, Sand
GENERAL HAZARDS:	All blocks are inert and can be regarded as non-hazardous within the meaning of the Health and Safety at Work Act 1974 and COSHH Regulations 1988. Suitable PPE (hard hat, gloves and safety footwear) should be worn as a matter of course when building constructions using concrete blocks.
EYE:	Avoid dust getting into the eyes by wearing suitable eye protection when carrying out any cutting, drilling and chasing of blocks. First Aid measures: If dust should irritate the eyes, wash with copious amounts of clean water. Seek medical advice if irritation persists.
SKIN:	Avoid abrasion by wearing suitable gloves and clothing. First Aid Measures: wash with soap and water. Seek medical advice if irritation persists.
INHALATION:	Wear a suitable dust-mask when carrying out operations that can create dust such as cutting, drilling, chasing. If using mechanical cutting devices, adequate dust suppression and dust extraction measures should be put in place wherever possible.
INGESTION:	First Aid Measures: drink plenty of water. Do not induce vomiting as this can lead to choking.
MANUAL HANDLING:	In the absence of a revised version of the HSE guidance given in their withdrawn Construction Sheet 37 'Handling Building Blocks' the following principles should be followed: There is a risk of injury in the repetitive handling of blocks heavier than 20kg. Repetitive manual handling of blocks over 20kg should be subject to a risk assessment and a safe system of work should be established before block-laying commences.
STORAGE:	Supplied as banded packs, with or without wooden pallets and should be stored on firm, level ground. Care should be taken when un-banding the packs as individual blocks may fall over. We recommend a maximum of 2 packs high for storage on firm, level ground. On soft, loose or uneven ground do not stack higher than 1 pack. Protect all unfinished blocks and blockwork from the weather. Thomas Armstrong will not accept ant liability for damage to the product where the product has been stored differently than in these recommendations.
DISPOSAL:	Concrete blocks are inert and non-toxic and should be disposed of in accordance with local regulations.

Haulage Details

Our extensive fleet of delivery vehicles enables us to match vehicle type to customer requirements and most site conditions that can be encountered during delivery. From large articulated wagons to small rigid vehicles we have the versatility to deal with most situations and offer safe, value for money delivery of blocks.

Pack quantities for certain block types can vary between manufacturing site as can vehicle capacities. In some factories we can produce voided packs and in others we cannot. It is therefore important to check and confirm details of packs, vehicle capacities and site access with your nearest sales office before delivery. The table below shows approximate load sizes for some of our popular block types using different delivery vehicles but is by no means comprehensive and should be used for indicative purposes.

Block Type	Block Size mm	Pack Quantity	6-wheeler Rigid (16 tonnes)	8-wheeler Rigid (19.5 tonnes)	Articulated Vehicle (27 tonnes)
Ultralite	100	72 blocks ($7.2m^2$)	20 - 21 packs $144.0 - 151.2m^2$	23 - 24 packs $165.6 - 172.8m^2$	29 - 30 packs $208.8 - 216.0m^2$
Insulite	100	72 blocks ($7.2m^2$)	15 - 16 packs $108.0 - 115.2m^2$	18 - 19 packs $129.6 - 136.8m^2$	25 - 26 packs $180.0 - 187.2m^2$
		90 blocks ($9.0m^2$)	12 - 13 packs $108.0 - 117.0m^2$	13 - 15 packs $117.0 - 135.0m^2$	19 - 21 packs $171.0 - 189.0m^2$
		Void Pack 86 blocks	13 - 14 packs $111.8 - 120.4m^2$	14 - 16 packs $120.4 - 137.6m^2$	20 - 22 packs $172.0 - 189.2m^2$
	140	48 blocks ($4.8m^2$)	16 - 17 packs $76.8 - 81.6m^2$	19 - 20 packs $91.2 - 96.0m^2$	27 - 28 packs $129.6 - 134.4m^2$
		60 blocks ($6.0m^2$)	12 - 13 packs $72.0 - 78.0m^2$	15 - 16 packs $90.0 - 96.0m^2$	20 - 22 packs $120.0 - 132.0m^2$
Solid Dense	100	72 blocks ($7.2m^2$)	11 - 12 packs $79.2 - 86.4m^2$	14 - 15 packs $100.8 - 108.0m^2$	20 - 22 packs $144.0 - 158.4m^2$
		Void Pack 86 blocks	7 - 8 packs $60.2 - 68.8m^2$	10 - 12 packs $86 - 103.2m^2$	17 - 19 packs $146.2 - 163.4m^2$
	140	48 blocks ($4.8m^2$)	12 - 13 packs $57.6 - 62.4m^2$	14 - 16 packs $67.2 - 76.8m^2$	21 - 22 packs $100.8 - 105.6m^2$
Cellular Dense	100	90 blocks ($9.0m^2$)	12 - 14 packs $108.0 - 126.0m^2$	14 - 15 packs $126.0 - 135.0m^2$	19 - 21 packs $171.0 - 189.0m^2$
	140	48 blocks ($4.8m^2$)	18 - 19 packs $86.4 - 91.2m^2$	21 - 22 packs $100.8 - 105.6m^2$	29 - 30 packs $139.2 - 144.0m^2$
Hollow Dense	140	60 blocks ($6.0m^2$)	12 - 13 packs $72.0 - 78.0m^2$	15 - 16 packs $90.0 - 96.0m^2$	20 - 22 packs $120.0 - 132.0m^2$
	215	40 blocks ($4.0m^2$)	14 - 15 packs $56.0 - 60.0m^2$	16 - 18 packs $64.0 - 72.0m^2$	24 - 25 packs $96.0 - 100.0m^2$
		32 blocks ($3.2m^2$)	20 - 21 packs $64.0 - 67.2m^2$	23 - 24 packs $73.6 - 76.8m^2$	29 - 30 packs $92.8 - 96.0m^2$
Armstart	300 x 275	72 blocks (number)	12 - 13 packs 864 - 936 blocks	14 - 15 packs 1008 - 1080 blocks	20 - 21 packs 1440 - 1512 blocks

Important Delivery Terms & Conditions

- It is the customer's responsibility to ensure that the site conditions are suitable for safe delivery and offloading of blocks. We reserve the right to refuse to offload if we assess that the site conditions are not conducive to safe offloading.
- Blocks should be stored safely and protected from damage in accordance with our recommended good practice as described on pages 35 & 41. We cannot accept liability for damage caused as a result of incorrect or unsafe storage of products.
- If our delivery driver is asked to offload in a situation that he has assessed that damage to plant or property may occur as a consequence, we ask that a Disclaimer Form (carried by all of our drivers) must be signed by site personnel before offloading can commence.
- We price deliveries on full load sizes. Part-load charges will be incurred by the customer for partly filled vehicles although we will take every measure possible to try and minimise additional charges to our customers.
- If our vehicle is stood waiting to be offloaded on site for over half an hour, a Standing Time charge will be incurred and for every additional hour that the vehicle is stood waiting thereafter.
- If the customer has supplied incorrect order information to use which results in the delivery being diverted or turned away, additional charges will be incurred including transport, handling and restocking costs.
- We cannot guarantee specific time deliveries although we will always do whatever we can to satisfy our customer's requirements as far as possible.
- When delivery has been agreed for a specific date, we cannot accept liability for a failure to deliver if unplanned events beyond our control such as accidents, congestion, severe weather and breakdown results in a cancelled load.

Index

Thomas Armstrong (Holdings) Limited

Workington Road, Flimby, Maryport, Cumbria. CA15 8RY

Established 1830

Our block manufacturing locations and regional sales offices

Whinfield Road, Rowlands Gill, Newcastle upon Tyne. NE39 1EH :	Tel: 01207 544214	Fax: 01207 541800	blocks@thomasarmstrong.co.uk
Pickhill, Thirsk, North Yorkshire. YO7 4JQ :	Tel: 01845 567282	Fax: 01845 567606	blocks@thomasarmstrong.co.uk
Blackdyke, Silloth, Cumbria. CA7 4PD :	Tel: 01900 68114	Fax: 01900 66136	cumbriablocksales@thomasarmstrong.co.uk
Bridge Road, Brompton on Swale, Richmond, North Yorkshire. DL10 7HW :	Tel: 01748 810204	Fax: 01748 813950	airtecsales@thomasarmstrong.co.uk
Unit G1, Park Road, Blackhill, Consett, Co Durham. DH8 5SP :	Tel: 01207 505655	Fax: 01207 592345	blocks@thomasarmstrong.co.uk
Knowsthorpe Gate, Cross Green, Leeds. LS9 0NP :	Tel: 0113 2320022	Fax: 0113 2870839	leedssales@thomasarmstrong.co.uk
Heysham Road, Aintree, Merseyide. L30 6UF :	Tel: 0151 5255991	Fax: 0151 5301676	aintreesales@thomasarmstrong.co.uk
Brook Street, Congleton, Cheshire. CW12 1RH :	Tel: 01260 273170	Fax: 01260 298150	aintreesales@thomasarmstrong.co.uk
North Lakes Business Park, Flusco, Penrith. CA11 0JB :	Tel: 01900 68114	Fax: 01900 66136	cumbriablocksales@thomasarmstrong.co.uk
Long Lane, Great Heck, North Yorkshire. DN14 0BT	Tel: 01977 661631	Fax: 01977 622155	gthecksales@thomasarmstrong.co.uk

www.thomasarmstrongconcreteblocks.co.uk