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Agrément Certificate
06/4309
Product Sheet 2

AIRTEC AIRCRETE BLOCKS AND AIRTEC THIN-JOINT SYSTEM

AIRTEC SEVEN AND AIRTEC FOUNDATION SEVEN

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Airtec Seven and Airtec Foundation Seven blocks, general-purpose building blocks with a gross dry density of 730 kgm^{-3} and an average compressive strength of 7.3 Nmm^{-2} . They are for use in the construction of loadbearing and non-loadbearing solid internal and external walls, above and below the damp-proof course and the inner and outer leaves of cavity walls.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Thermal insulation — the thermal conductivity (λ value) of the blocks should be taken as $0.17 \text{ Wm}^{-1}\text{K}^{-1}$ for 'protected blockwork' (see section 5).

Sound insulation — the blocks may be used in separating walls and flanking elements to separating walls and floors (see section 6).

Properties in relation to fire — the blocks are 'non-combustible' as defined in the national Building Regulations (see section 7).

Resistance to moisture — the blocks are suitable for use in situations up to and including A3 as defined in BS 5628-3 : 2005 and for use in classes DS1 and DS2 of soil and groundwater as defined in BRE Special Digest 1 : 2005 *Concrete in aggressive ground: Part C : Assessing the aggressive chemical environment* (see section 8).

Structural aspects — walls should be designed and constructed in accordance with BS 5628-3 : 2005 (or the relevant Eurocodes) and the blocks are suitable for use in the situations detailed in these documents (see section 10).

Durability — Aircrete is a durable material, and walls will have a durability equivalent to that of traditional masonry (see section 16).



The BBA has awarded this Agrément Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément



Simon Wroe
Head of Approvals — Materials



Greg Cooper
Chief Executive

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The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, Airtec Seven and Airtec Foundation Seven Blocks, if used in accordance with the provisions of this Certificate, can meet or contribute to meet the relevant requirements of the following Building Regulations:



The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	A1	Loading
Requirement:	A2	Ground movement
Comment:		Walls built from the blocks can meet these Requirements. See sections 3.1 to 3.4, 10.1 to 10.3 and the <i>Installation</i> part of this Certificate. See also the <i>Technical Specification</i> section of this Certificate.
Requirement:	B3(1)(2)	Internal fire spread (structure)
Comment:		Walls constructed from the blocks have the estimated fire resistances detailed in sections 7.1 and 7.2 of this Certificate.
Requirement:	B4(1)	External fire spread
Comment:		Walls constructed from the blocks have fire resistances detailed in sections 7.1 and 7.2 of this Certificate.
Requirement:	C2(a)	Resistance to moisture
Comment:		Walls built from the blocks will resist ground moisture and can meet this Requirement. See sections 3.1 to 3.4, 8.1 and 8.2 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		Walls built from the blocks and suitably finished will resist wind-driven rain. See sections 3.1 to 3.4, 8.4 and 8.5 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The blocks will contribute to limiting the risk of condensation. See sections 9.1 and 9.2 of this Certificate.
Requirement:	E1	Protection against sound from other parts of the building and adjoining buildings
Requirement:	E2(a)	Protection against sound within a dwelling-house etc
Comment:		Walls built from the blocks can meet these Requirements. See sections 6.1 to 6.7 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The blocks will contribute to limited heat loss through walls. See sections 5.2 and 5.3 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The blocks are acceptable materials. They should be specified and installed in accordance with sections 3.1 to 3.4, 16 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The blocks can contribute to a construction meeting this Regulation. See sections 15 and 16 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	1.1(a)(b)	Structure
Comment:		Walls constructed from the blocks in accordance with sections 3.1 to 3.4 and 10.1 to 10.3 of this Certificate can comply with this Standard.
Standard:	2.1	Compartmentation
Standard:	2.2	Separation
Standard:	2.3	Structural protection
Standard:	2.4	Cavities
Standard:	2.5	Internal linings
Standard:	2.6	Spread to neighbouring buildings
Comment:		The blocks are non-combustible and are unrestricted by these Standards, with reference to clauses 2.1.1 ⁽²⁾ , 2.1.4 ⁽²⁾ , 2.1.5 ⁽²⁾ , 2.1.8 ⁽²⁾ , 2.2.1 ⁽¹⁾⁽²⁾ to 2.2.5 ⁽¹⁾⁽²⁾ , 2.2.6 ⁽¹⁾ , 2.2.7 ⁽¹⁾⁽²⁾ , 2.2.8 ⁽¹⁾ , 2.2.10 ⁽¹⁾ , 2.2.13 ⁽²⁾ , 2.2.15 ⁽²⁾ , 2.3.1 ⁽¹⁾⁽²⁾ to 2.3.5 ⁽¹⁾⁽²⁾ , 2.4.1 ⁽¹⁾⁽²⁾ , 2.4.2 ⁽¹⁾⁽²⁾ , 2.6.1 ⁽¹⁾⁽²⁾ , 2.6.5 ⁽¹⁾ , 2.6.6 ⁽¹⁾⁽²⁾ and 2.6.7 ⁽²⁾ respectively. See sections 7.1 to 7.3 of this Certificate.
Standard:	3.4	Moisture from the ground
Comment:		Foundation blocks can meet this Standard, with reference to clauses 3.4.1 ⁽¹⁾⁽²⁾ and 3.4.5 ⁽¹⁾⁽²⁾ . See sections 8.1, 8.2, 10.2 and 10.3 of this Certificate.
Standard:	3.10	Precipitation
Comment:		Walls designed and constructed from the blocks and suitably finished in accordance with sections 8.4 and 8.5 of this Certificate will resist wind-driven rain and can meet this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ to 3.10.5 ⁽¹⁾⁽²⁾ .
Standard:	3.15	Condensation
Comment:		Walls designed and constructed from the blocks in accordance with sections 9.1 and 9.2 of this Certificate can meet this Standard, with reference to clauses 3.15.1 ⁽¹⁾ , 3.15.4 ⁽¹⁾ and 3.15.5 ⁽¹⁾ .
Standard:	5.1	Resisting sound transmission to dwellings
Comment:		Walls built from the blocks can satisfy this Standard, with reference to clauses 5.1.1 ⁽¹⁾ and 5.1.2 ⁽²⁾ , provided the construction complies with the conditions set out in sections 6.2, 6.4 and 6.5 of this Certificate.

Standard:	6.1	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:	Walls constructed from the blocks can satisfy these Standards, with reference to clauses 6.1.1 ⁽¹⁾ , 6.1.2 ⁽¹⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾⁽²⁾ , 6.2.4 ⁽²⁾ , 6.2.9 ⁽¹⁾ , 6.2.10 ⁽²⁾ , 6.2.11 ⁽¹⁾ , 6.2.12 ⁽²⁾ and 6.2.13 ⁽¹⁾ respectively, provided construction is in accordance with a solution detailed in sections 5.2 and 5.3 of this Certificate.	
Regulation:	12	Building standards – conversions
Comment:	All comments given for these blocks under Regulation 9 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).	



The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:	The blocks are acceptable. See sections 3.1 to 3.4 of this Certificate. See also section 16 and the <i>Installation</i> part of this Certificate.	
Regulation:	B3(2)	Suitability of certain materials
Comment:	The blocks do not normally require maintenance. See section 15 of this Certificate.	
Regulation:	C4(a)	Resistance to ground moisture
Comment:	The blocks can be used in a wall to resist ground moisture to satisfy this Regulation. See sections 3.1 to 3.4 and 8.1 and 8.2 of this Certificate.	
Regulation:	C4(b)	Resistance to ground moisture
Comment:	Walls built from the blocks and suitably finished will resist wind-driven rain and can be used to satisfy this Regulation. See sections 3.1, 3.4, 8.4 and 8.5 of this Certificate.	
Regulation:	C5	Condensation
Comment:	Walls designed and constructed in accordance with section 9.2 of this Certificate will contribute to limiting the risk of condensation and can satisfy this Regulation.	
Regulation:	D1	Stability
Comment:	Walls constructed in accordance with sections 3.1 to 3.4 and 10.1 to 10.3 of this Certificate are deemed to satisfy this Regulation.	
Regulation:	E4(1)(2)	Internal fire spread – Structure
Comment:	Walls constructed from the blocks have appropriate fire resistance. See sections 7.1 and 7.2 of this Certificate.	
Regulation:	E5(a)	External fire spread
Comment:	Walls constructed from the blocks have fire resistances detailed in sections 7.1 and 7.2 of this Certificate.	
Regulation:	F2(a)(i)	Conservation measures
Comment:	The blocks will contribute to limiting heat loss through walls. See sections 5.2 and 5.3 of this Certificate.	
Regulation:	F3	Target carbon dioxide Emissions Rate
Comment:	Walls constructed from the blocks can help to satisfy this Regulation. See sections 5.2 and 5.3 of this Certificate.	
Regulation:	G2(1)	Separating walls and separating floors
Comment:	Walls built from the blocks may be used to satisfy this Regulation. See sections 6.2, 6.4 and 6.5 of this Certificate.	

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 *Description* (1.3, Table 2 footnotes 2 and 3) and 2 *Delivery and site handling*, (2.1).

Non-regulatory Information

NHBC Standards 2008

NHBC accepts the use of Airtec Seven and Airtec Foundation blocks, when installed and used in accordance with this Certificate as meeting Technical Requirement R3, in relation to *NHBC Standards*, Chapters 6.1 *Exterior masonry walls* and 6.3 *Internal walls*.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Airtec Seven and Airtec Foundation Seven blocks, when installed and used in accordance with this Certificate, satisfy the requirements of the *Zurich Building Guarantee Technical Manual*, Section 3 *Substructure*, Sub-section *Foundation* and Section 4 *Superstructure*, Sub-section *External walls – masonry*.

General

This Certificate relates to Airtec Seven and Airtec Foundation Seven blocks for use as general-purpose aerated concrete (aircrete) building blocks.

The blocks are suitable for the construction of loadbearing and non-loadbearing solid internal and external walls, above and below the damp-proof course and the inner and outer leaves of cavity walls and the foundation blocks are suitable for use below the damp-proof course in classes DS1 and DS2 of soil and groundwater.

Technical Specification

1 Description

1.1 Airtec Seven and Airtec Foundation Seven blocks comprise cement, lime and pulverized fuel ash, the proportions of which may be varied. Aluminium powder is the aerating agent. The blocks are wire-cut to the required dimensions and are cured in high-pressure steam autoclaves to increase their physical and chemical stability.

1.2 Airtec Seven Wall and Foundation blocks are supplied in the sizes detailed in Table 1.

	Seven wall blocks ⁽¹⁾	Foundation Seven blocks	
Face size (mm)	620 x 215	620 x 140	620 x 215
Thickness (mm)	100 to 215	275, 300 and 350	260, 275 and 300

(1) Also available as large format blocks with a size of 620 mm x 430 mm x 100 mm and as coursing units.

1.3 The dry density and compressive strength of the blocks when tested in accordance with BS EN 771-4 : 2003 are as detailed in Table 2.

	Airtec Seven ⁽²⁾ /Foundation ⁽³⁾
Gross dry density (kgm ⁻²)	730 ± 50
Average compressive strength (Nmm ⁻²) ⁽¹⁾	7.3
Minimum individual block compressive strength (Nmm ⁻²)	5.8

(1) Conditioned to 6% moisture and surface ground.

(2) A typical block weight for a 100 mm x 215 mm x 620 mm block is 10 kg.

(3) A typical block weight for a 275 mm x 620 mm x 140 mm block is 18 kg and for a 260 mm x 620 mm x 215 mm block is 25 kg.

1.4 The blocks are manufactured to comply with the requirements of BS EN 771-4 : 2003 and the quality control of the process is operated automatically and continuously to satisfy the requirements as defined in BS 5628-1 : 2005.

2 Delivery and site handling

2.1 The blocks are supplied in shrink-wrapped standard packs and should be unloaded using mechanical grabs. Fork-lift trucks may be used for palletised blocks.

2.2 The blocks should be stored on a dry, level area and the wrapping should be kept in place until the blocks are required for use.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Airtec Seven and Airtec Foundation Seven blocks.

Design Considerations

3 General



3.1 The blocks are suitable for the construction of loadbearing and non-loadbearing solid internal and external walls, above and below the damp-proof course and the inner and outer leaves of cavity walls.

3.2 The blocks comply with the requirements of BS EN 771-4 : 2003 and product packaging is CE Marked, accordingly.

3.3 The blocks should be specified in accordance with BS EN 771-4 : 2003 and BS 6073-2 : 1981.

3.4 Walls built from the blocks should be designed and constructed in accordance with the relevant recommendations of BS 5628-1 : 2005, BS 5628-3 : 2005 and BS 5250 : 2002.

4 Practicability of installation

The blocks should be installed by blocklayers familiar with this type of product.

5 Thermal insulation

5.1 Thermal transmittance (U value) calculations of walls should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report (BR 443) *Conventions for U-value calculations*, using the properties shown in Table 3.

Table 3 External wall thermal properties

Property	
Airtec Seven block thermal conductivity ($\text{Wm}^{-1}\text{K}^{-1}$)	0.17 ⁽¹⁾
Mortar % (thin-joint)	1.3 ⁽²⁾
Mortar % (standard 10 mm joint)	6.0 ⁽²⁾

(1) Foundation block conductivity to be taken as $0.18 \text{ Wm}^{-1}\text{K}^{-1}$, for exposed conditions.

(2) Mortar conductivity to be taken as $0.88 \text{ Wm}^{-1}\text{K}^{-1}$.



5.2 External cavity walls incorporating the Airtec Seven block and brick outer leaf will achieve calculated U values between 0.5 and $0.7 \text{ Wm}^{-2}\text{K}^{-1}$. Therefore they will need to incorporate thermal insulation as necessary to achieve, or improve on as appropriate, the following 'mean' design U values specified in:

England and Wales and Northern Ireland — 0.30 to $0.35 \text{ Wm}^{-2}\text{K}^{-1}$.

Scotland — 0.20 to $0.30 \text{ Wm}^{-2}\text{K}^{-1}$.

5.3 The blocks can contribute to maintaining continuity of thermal insulation at junctions between elements and around openings. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in:

England and Wales — *Limiting thermal bridging and air leakage. Robust constructions details for dwellings and similar buildings* TSO 2002 or Accredited Construction Details (version 1.0).

Scotland — Accredited Construction Details (Scotland).

Northern Ireland — Accredited Construction Details (version 1.0).

6 Sound insulation

Separating constructions — Robust Details



6.1 Separating walls will satisfy requirements for limiting airborne sound transmission in England and Wales when they, and their associated flanking elements, are built in accordance with a construction described in Robust Details Part E *Resistance to the passage of sound*.

Separating constructions — other



6.2 Separating walls constructed from the blocks, in conjunction with appropriate flanking elements, will also satisfy the national Building Regulations requirements for limiting airborne sound transmission when they comply with one of the following provisions:

(a) a cavity wall comprising two 100 mm thick leaves, constructed in accordance with section 6.4 or

(b) a wall constructed as described in the following documents:

England and Wales — Approved Document E, paragraphs 2.72 to 2.76, wall type 2.4 or paragraph 2.107, wall type 3

Scotland — Mandatory Standard 5.1⁽¹⁾ (wall type 3D)

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklet G, Section 1.7, wall type 3D.



6.3 Constructions described in section 6.2 are subject to pre-completion testing in England and Wales in accordance with section 1 of Approved Document E.



6.4 Constructions described in section 6.2(a) must comply with the following provisions:

- the wall cavity must not be less than 75 mm wide and must be continued into the roof space
- all vertical and horizontal joints should be filled with mortar not exceeding a strength of 1:1:6
- penetration by structural members, and services should be avoided; where such penetration is unavoidable, full sealing should be applied at the construction stage

- where joists are at right angles to the separating wall, joist hangers must be used
- wall ties should be of type A to Approved Document E or an alternative proven not to increase the transmission of airborne sound in comparison. This may be determined by test evidence or by reference to an Agrément Certificate
- electrical and TV sockets should not be placed on the wall where avoidable, and never within a block length of each other on opposite sides of the wall
- gas flues should not be built into the separating wall where avoidable; where such construction is unavoidable, full sealing should be applied at the construction stage
- the walls must be finished with plasterboard on dabs or plaster to both room faces. This finish need not be carried into the roof space
- the use of lightweight ceiling boards, for example, foam-filled, should be avoided.

External flanking walls



6.5 The following constructions may be used to produce external flanking walls to separating walls and floors:

- any Airtec Seven blockwork with a minimum thickness of 100 mm with general purpose or thin-layer mortar and finished internally with plaster or plasterboard on dabs or
- any blockwork of minimum surface mass 120 kgm^{-2} excluding finishes
- in suitable constructions as defined in Robust Details and England and Wales Approved Document E *Resistance to the passage of sound*, Scotland Technical Booklets (Domestic and Non-Domestic) Regulation 9, Mandatory Standard 5.1 *Resisting sound transmission to dwellings* using appropriate constructions and Northern Ireland Technical Booklet G *Sound*. Details of particular requirements are given in Table 4.

Table 4 Requirements for external walls flanking separating walls

Separating wall type ⁽¹⁾	England and Wales	Scotland	Northern Ireland
Wall Type 1: Solid Masonry	Condition 1 Condition 2 Condition 3 Condition 6	Condition 1 Condition 3	Condition 1 Condition 2 Condition 4 Condition 5
Wall Type 2: Cavity Masonry	Condition 1 Condition 3 Condition 6	Condition 1 Condition 6	Condition 1 Condition 3 Condition 4 Condition 5 Condition 6
Subject of current Agrément Certificate ⁽²⁾	Condition 1 Condition 3		Condition 1 Condition 3

(1) Separating wall type as defined in the Building Regulations: England and Wales, Approved Document E; Scotland, Mandatory Standard 5.1; clauses 5.1.4 and 5.1.5 (Domestic) Northern Ireland; Technical Booklet G.

(2) Where the separating wall is not the subject of an Agrément Certificate, the blocks may be used in repeating an existing acceptable construction in accordance with the provisions of Technical Booklet G, Section 2 in Northern Ireland.

Condition 1. The external wall should be bonded to the separating wall in such a way that the separating wall contributes at least 50% of the bond at the junction, or abuts the separating wall and be tied to it. In Scotland and Northern Ireland, ties should be at no more than 300 mm vertical centres.

Condition 2. The external wall should have openings on both sides of the separating wall at every storey, which are at least 1 m high and not more than 700 mm from the face of the separating wall.

Condition 3. If the external wall is a cavity wall, the cavity should be stopped with a flexible closer. In Northern Ireland this should be mineral wool. In England and Wales, a closer is not required if the cavity is fully filled with mineral wool or expanded polystyrene beads.

Condition 4. The external wall should have openings on either side of a separating wall that are not less than 650 mm apart.

Condition 5. The inner leaf of the external wall should not extend past the end of the separating wall.

Condition 6. In England and Wales, the inner leaf should have a minimum mass per unit area of 120 kgm^{-2} excluding finishes for separating wall type 2.2 or for any separating wall type where there is also a separating floor. In Scotland and Northern Ireland the inner leaf should have a minimum mass per unit area of 120 kgm^{-2} for separating wall types 2A, 2C or 2D.

Separating walls for residential rooms



6.6 For walls subject to the Building Regulations England and Wales, the requirements of Table 0.1 b of Approved Document E will be met by any construction as described in sections 6.1 and 6.2(a) and (b) of this Product Sheet where the separating floors are discontinuous or a single leaf of 215 mm thick, Airtec Seven blockwork plastered on both room faces.

Internal partitions

6.7 For internal walls subject to the Building Regulations in England and Wales, the requirements of Table 0.2 of Approved Document E will be met by:

- a minimum 90 mm blockwork of Airtec Seven finished with lightweight plaster, dense plaster or plasterboard on dabs
- a construction supported by laboratory sound insulation tests meeting the requirements of Approved Document E Table 0.2
- a minimum of 190 mm Airtec Seven blockwork with any finish, where a surface mass of 120 kgm^{-2} is required
- a wall meeting requirements for internal wall Type D in Section 5.20 of Approved Document E.

Note: These constructions are also suitable where the partitions abut a masonry separating wall specified in this Product Sheet.

7 Properties in relation to fire



7.1 Both BRE report (BR 128 : 1988) *Guidelines for the construction of fire-resisting structural elements* and BS 5628-3 : 2005 indicate that walls incorporating the blocks with standard mortar jointing can achieve fire resistance periods as follows:

2 x 100 mm cavity masonry walls	1 hour
100 mm inner leaf and brick outer (from each side)	1 hour
100 mm partitions (loadbearing and non-loadbearing)	1 hour

7.2 Constructions incorporating thin-joint mortar should be subjected to testing or assessment.



7.3 For Scotland, the Airtec Seven block is classified as 'non-combustible' and may be used in external walls less than one metre from a boundary, and to support 'non-combustible' party floors.

7.4 With regard to the placing of cavity barriers, the surface of the Airtec Seven block may be taken as Class 0.

7.5 The wall ties and anchors must be 'non-combustible'.

8 Resistance to moisture

Work below damp-proof course



8.1 The blocks are suitable for use in situations up to and including A3 as defined in BS 5628-3 : 2005, Table 13 (ie where there is a high risk of saturation with freezing).

8.2 The blocks are suitable for use in classes DS1 and DS2 of soil or groundwater as defined in BRE Special Digest 1 : 2005.

8.3 In unusual soil and/or groundwater conditions, eg soils contaminated by industrial waste or highly acid soils, expert advice should be obtained.

Work above damp-proof course



8.4 Walls built from the blocks should be designed and constructed in accordance with the relevant documents of:

England and Wales — Approved Document C

Scotland — Mandatory Standard 3.10, clauses 3.10.1⁽¹⁾⁽²⁾ to 3.10.4⁽¹⁾⁽²⁾ and 3.10.6⁽¹⁾⁽²⁾

(1) Technical Handbook (Domestic)

(2) Technical Handbook (Non-Domestic)

Northern Ireland — Technical Booklet C.

8.5 For single leaf constructions, the minimum block thicknesses to be used in solid rendered external walls (relate to exposure as defined in BS 5628-3 : 2005) are given in Table 5.

Table 5 Minimum block thicknesses⁽¹⁾

Exposure	Very severe	Severe	Moderate	Sheltered
Minimum block thickness (mm)	215	190	140	90

(1) Increased thicknesses may be necessary to meet other requirements such as structural stability (see section 3.4), *Thermal insulation* or *Sound insulation* as detailed in the *Design Considerations* section.

9 Condensation risk



9.1 Walls will limit the risk of surface condensation adequately when the thermal transmittance (U value) does not exceed $0.7 \text{ Wm}^{-2}\text{K}^{-1}$ ($1.2 \text{ Wm}^{-2}\text{K}^{-1}$ in Scotland) at any point and, the junctions with floors, roof and openings comply with section 5.3.



9.2 Walls will limit the risk of interstitial condensation adequately when they are constructed in accordance with BS 5250 : 2002 (Section 8 and Annex D). For the purpose of calculations, the blocks' water vapour resistance factor (μ) may be taken as 10 (a resistivity of $50 \text{ MNsg}^{-1}\text{m}^{-1}$), as given in BS EN 12524 : 2000, Table 2.

10 Structural aspects

General



10.1 Design and construction should be in accordance with BS 5628-3 : 2005 or relevant Eurocodes.

10.2 Supervision and workmanship should ensure that coursing is carried out such that bearings are not less than 100 mm in length or the length required by the design calculation, whichever is the greater. Lintels should not bear on short lengths of cut block. Where possible the masonry should be set out to provide a full block under a bearing. Pressed steel lintels should have a bearing of not less than 150 mm.

Concentrated Loads

10.3 Increased local stresses may be permitted in the Airtec masonry provided the member applying the load is sensibly rigid and of appropriate bearing area or a suitable spreader is introduced. Design should be in accordance with BS 5628-1 : 2005, Clause 30.

10.4 Joist hangers may be used provided that:

- when designing in accordance with BS 5628-1 : 2005, the full effect of the maximum eccentric load at the joist hanger detail should be taken into account (see Clause 27). In addition, it should be assumed that joist hangers are not effectively rigid in terms of BS 5628-1 : 2005, Clause 30 and when calculating the local bearing stress under single hangers, the effective load applied via the hanger should be determined by an acceptable elastic theory
- they are compatible with aircrete blocks with average compressive strengths of 7.3 Nmm^{-2} , or above. The dimensions used in the design and the manufacture from appropriate materials is set out in BS 5628-3 : 2005, Table 1
- supervision and workmanship⁽¹⁾ are adequate to ensure that:
 - installation is in accordance with the hanger manufacturer's instructions
 - the Airtec course to carry the hangers is level and at the correct height, any adjustments being made before the course is laid
 - the hanger bears directly on a complete block with the back plate flat against the block
 - the gap between the joist and the back plate does not exceed 6 mm
 - construction complies with the conditions used in the design and restraint type hangers are used when specified
 - the blockwork above the hanger is completed and matured before any load is applied to the hanger.

(1) Further guidance may be obtained from BRE Defect Action Sheet 58 : 1984 *Suspended timber floors : joist hangers in masonry walls – installation*.

11 Movement

11.1 The moisture movement of the blocks may be taken as a nominal value of 0.4 mm.m^{-1} . Movement joints should be designed in accordance with BS 5628-3 : 2005.

11.2 Movement may be accommodated using movement joints or bed joint reinforcement, or a combination of the two.

Movement joints

11.3 Movement joints should be provided strictly in accordance with BS 5628-3 : 2005 and the Certificate holder's instructions. Vertical movement joints should be provided (subject to section 11.2):

- at 6 m centres in long plain walls or where the aspect ratio (length/height) of a panel exceeds 2 : 1
- where internal partitions or loadbearing walls abut the inner leaf of external walls
- as necessary above and below window openings, and above door openings.

Bed joint reinforcement

11.4 Mortars should not be stronger than the blocks; using the definitions in BS 5628-3 : 2005, Tables 13 and 15, mortar designation (iii) or (iv) should be used in A1 conditions, while mortar designation (iii) may be used in A2 or A3 conditions.

12 Rendering and plastering

As with all masonry, rendering should be carried out in accordance with BS EN 13914-1 : 2005 and plastering should be carried out in accordance with BS EN 13914-2 : 2005. Suitable mixes for use with the Airtec masonry may be determined by reference to the Certificate holder; account should be taken of the moisture condition of the masonry before finishes are applied. The Certificate holder should be consulted regarding low water vapour permeability renders.

13 Chasing

In accordance with BS 5628-3 : 2005, vertical chases in the Airtec masonry should not exceed one-third of the thickness of the leaf, and horizontal chases should not exceed one-sixth of the thickness of the leaf at any point.

14 Fixings

14.1 Cut nails or proprietary nails may be used for lightweight fixtures. For heavier fixtures, screws and plugs, nailable expansion fixings or helical fixings should be used. A minimum of 50 mm penetrations into the blocks should be achieved in all cases.

14.2 Fixings must be selected and installed in accordance with the fixings manufacturer's instructions, paying particular attention to drilling depth, drill diameter, minimum spacing's and minimum edge distance.

14.3 Mean pull-out loads for certain proprietary fixings used with the blocks can be obtained from this Certificate holder. In each case a safety factor of 4 is recommended to establish a safe working load.

14.4 Guidance on some typical loads applied by relevant components (eg for services and finishing) can be obtained from BS 648 : 1964 and by common fixtures from Table 5 of BS 8200 : 1985.

15 Maintenance



As the blocks are confined and have suitable durability (see section 16), maintenance is not normally required.

16 Durability



Aircrete is a durable material. Walls will have durability equivalent to that of traditional masonry.

Installation

17 General

17.1 Installation of Airtec Seven and Airtec Foundation Seven blocks should be carried out strictly in accordance with the provisions detailed in this Certificate. Technical advice should be sought from the Certificate holder.

17.2 The blocks are resistant to damage by site handling in accordance with BS 5628-3 : 2005, Section A.4.1.3 *Handling and site storage*.

17.3 The level of supervision during installation of the Airtec masonry and the associated structure, as with all masonry, must be sufficient to ensure the quality of workmanship described in BS 5628-3 : 2005 and BS 8000-3 : 2001.

Technical Investigations

18 Tests

Independent test reports were examined and assessed, relating to:

- drying shrinkage
- density
- compressive strength
- dimensional accuracy
- thermal properties
- behaviour in fire
- risk of condensation and pattern staining
- assessment of freeze/thaw resistance to MOAT No 12 : 1977.

19 Investigations

19.1 The manufacturing process was examined, including the methods adopted for quality control and details were obtained of the quality and composition of the materials used.

19.2 Houses in various stages of erection were inspected to assess the practicability of installation and site storage.

Additional Information

The management systems of Thomas Armstrong (Concrete Blocks) Ltd have been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2000 by the British Board of Agrément (Certificate 06/Q006).

Bibliography

- BS 648 : 1964 *Schedule of weights of building materials*
- BS 5250 : 2002 *Code of practice for control of condensation in buildings*
- BS 5628-1 : 2005 *Code of practice for the use of masonry — Structural use of unreinforced masonry*
- BS 5628-3 : 2005 *Code of practice for the use of masonry — Materials and components, design and workmanship*
- BS 6073-2 : 1981 *Precast concrete masonry units — Method for specifying precast concrete masonry units*
- BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*
- BS 8200 : 1985 *Code of practice for design of non-loadbearing external vertical enclosures of buildings*
- BS EN 771-4 : 2003 *Specification for masonry units — Autoclaved aerated concrete masonry blocks*
- BS EN 12524 : 2000 *Building materials and products — Hygrothermal properties — Tabulated design values*
- BS EN 13914-1 : 2005 *Design, preparation and application of external rendering and internal plastering — External rendering*
- BS EN 13914-2 : 2005 *Design, preparation and application of external rendering and internal plastering — Design considerations and essential principles for internal plastering*
- BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*
- BS EN ISO 9001 : 2000 *Quality management systems — Requirements*
- MOAT No 12 : 1977 *The Assessment of Precast, Insulating Concrete Blocks for General use in Building*

20 Conditions

20.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

20.2 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

20.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

20.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

20.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.

