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Agrément Certificate
06/4309
Product Sheet 4

AIRTEC AIRCRETE BLOCKS AND AIRTEC THIN-JOINT SYSTEMS

AIRTEC XL

This Agrément Certificate Product Sheet⁽¹⁾ relates to Airtec XL, general purpose, autoclaved aerated concrete (Aircrete) building blocks, for use above and below the damp-proof course in the construction of loadbearing and non-loadbearing solid internal and external walls, and the inner and outer leaves of cavity walls.

(1) Hereinafter referred to as 'Certificate'.

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

Strength and stability — the blocks have a mean compressive strength of $2.9 \text{ N}\cdot\text{mm}^{-2}$ and are suitable for use in walls designed and constructed in accordance with BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006 and their UK National Annexes, and PD 6697 : 2010 (see section 6).

Thermal performance — the thermal conductivity (λ value) of the blocks may be taken as $0.09 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ in 'protected blockwork' applications (see section 7).

(1) $0.09 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ ($\lambda_{10, \text{dry}}$), declared dry value.

Sound insulation — the blocks may be used in flanking elements to separating walls and floors (see section 8).

Properties in relation to fire — the blocks are 'non-combustible' and classified as Class A1 as defined in the national Building Regulations (see section 9).

Use below the damp-proof course — the blocks are suitable for use in situations up to and including MX3.2 as defined in BS EN 1996-2 : 2006 or A3 as defined in PD 6697 : 2010, and for use in classes DS1 and DS2 of soil and groundwater, as defined in BRE Special Digest 1 : 2005 (see section 10).

Durability — walls constructed using the blocks will have a durability equivalent to those of traditional masonry (see section 15).



The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Paul Valentine

Technical Excellence Director

Claire Curtis-Thomas

Chief Executive

Date of Fourth issue: 15 November 2018

Originally certificated on 31 March 2006

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.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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Regulations

In the opinion of the BBA, Airtec XL, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	A1	Loading
Requirement:	A2	Ground movement
Comment:	Walls designed for, and constructed from, the product can satisfy these Requirements. See sections 4, 6.1 and 6.2 and the <i>Installation</i> part of this Certificate.	
Requirement:	B3(1)(2)(3)(a)(4)	Internal fire spread (structure)
Requirement:	B4(1)	External fire spread
Comment:	The product can contribute to a construction satisfying these Requirements. See sections 9.1 to 9.3 of this Certificate.	
Requirement:	C2(a)	Resistance to moisture
Comment:	The product can contribute to satisfying this Requirement. See sections 10.1 and 10.2 of this Certificate.	
Requirement:	C2(a)	Resistance to moisture
Comment:	Suitably finished walls designed for, and constructed from, the product can contribute to satisfying this Requirement. See sections 4.4 and 11 of this Certificate.	
Requirement:	C2(c)	Resistance to moisture
Comment:	Walls designed for, and constructed from, the product will contribute to limiting the risk of condensation. See sections 12.1 and 12.2 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 designed for, and constructed from, the product can satisfy these Requirements. See sections 8.1, 8.3 and 8.4 of this Certificate.	
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:	Walls designed for, and constructed from, the product will contribute to limiting heat loss through the walls. See section 7.1 of this Certificate.	
Regulation:	7	Materials and workmanship
Comment:	The product is acceptable. See section 15 and the <i>Installation</i> part of this Certificate.	
Regulation:	26	CO ₂ emission rates for new buildings
Regulation:	26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Regulation:	26A	Primary energy consumption rates for new buildings (applicable to Wales only)
Regulation:	26B	Fabric performance values for new dwellings (applicable to Wales only)
Comment:	The product can contribute to satisfying these Regulations when compensating fabric/services measures are taken. See section 7.1 of this Certificate.	



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:	Use of the product satisfies the requirements of this Regulation. See section 15 and the <i>Installation</i> part of this Certificate.	
Regulation:	9	Building standards applicable to construction
Standard:	1.1(a)(b)	Structure
Comment:	Walls designed for, and constructed from, the product can satisfy this Standard, with reference to clauses 1.1.1 ⁽¹⁾⁽²⁾ to 1.1.3 ⁽¹⁾⁽²⁾ . See sections 4, 6.1 and 6.2 and the <i>Installation</i> part of this Certificate.	
Standard:	2.1	Compartmentation
Standard:	2.2	Separation
Standard:	2.3	Structural protection
Standard:	2.4	Cavities
Standard:	2.6	Spread to neighbouring buildings
Comment:	The product can contribute to a construction satisfying these Standards, with reference to clauses 2.1.1 ⁽²⁾ , 2.1.4 ⁽²⁾ , 2.1.5 ⁽²⁾ , 2.1.8 ⁽²⁾ , 2.1.9 ⁽²⁾ , 2.1.10 ⁽²⁾ , 2.1.11 ⁽²⁾ , 2.1.12 ⁽²⁾ , 2.1.13 ⁽²⁾ , 2.1.15 ⁽²⁾ , 2.2.1 ⁽¹⁾⁽²⁾ to 2.2.5 ⁽¹⁾⁽²⁾ , 2.2.8 ⁽¹⁾ , 2.2.10 ⁽¹⁾ , 2.3.1 ⁽¹⁾⁽²⁾ to 2.3.5 ⁽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⁾ . See sections 9.1 to 9.3 of this Certificate.	
Standard:	3.4	Moisture from the ground
Comment:	The products can contribute to satisfying this Requirement. See sections 10.1 and 10.2 of this Certificate.	
Standard:	3.10	Precipitation
Comment:	Suitably finished walls designed for, and constructed from, the product can contribute to satisfying this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ , 3.10.2 ⁽¹⁾ , 3.10.3 ⁽¹⁾⁽²⁾ and 3.10.6 ⁽¹⁾⁽²⁾ . See sections 4.4 and 11 of this Certificate.	
Standard:	3.15	Condensation
Comment:	Walls designed for, and constructed from, the product can contribute to limiting the risk of condensation, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾ , 3.15.5 ⁽¹⁾⁽²⁾ and 3.15.6 ⁽¹⁾⁽²⁾ . See sections 12.1 and 12.2 of this Certificate.	

Standard:	5.1	Noise separation
Comment:		Walls designed for, and constructed from, the product can satisfy this Standard, with reference to clauses 5.1.1 ⁽¹⁾⁽²⁾ to 5.1.5 ⁽¹⁾⁽²⁾ . See sections 8.2 and 8.3 of this Certificate.
Standard:	5.2	Noise reduction between rooms
Comment:		Walls designed for, and constructed from, the product can satisfy this Standard, with reference to clauses 5.2.1 ⁽¹⁾⁽²⁾ and 5.2.2 ⁽¹⁾⁽²⁾ . See sections 8.2 and 8.3 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		Walls designed for, and constructed from, the product can contribute to satisfying these Standards, with reference to clauses 6.1.1 ⁽¹⁾ , 6.1.2 ⁽¹⁾ , 6.1.4 ⁽²⁾ , 6.1.6 ⁽¹⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽²⁾ , 6.2.5 ⁽²⁾ , 6.2.6 ⁽¹⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽¹⁾⁽²⁾ , 6.2.9 ⁽¹⁾⁽²⁾ , 6.2.10 ⁽²⁾ , 6.2.11 ⁽¹⁾⁽²⁾ , 6.2.12 ⁽¹⁾⁽²⁾ and 6.2.13 ⁽¹⁾⁽²⁾ . See section 7.1 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The product can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for the product under Regulation 9, Standards 1 to 6, 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) 2012 (as amended)

Regulation:	23(a)(i)(iii)(b)	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 15 and the <i>Installation</i> part of this Certificate.
Regulation:	28	Resistance to moisture and weather
Comment:		Suitably finished walls designed for, and constructed from, the product can contribute to satisfying this Regulation. See sections 4.4, 10.1, 10.2 and 11 of this Certificate.
Regulation:	29	Condensation
Comment:		Walls designed for, and constructed from, the product will contribute to limiting the risk of condensation. See section 12.2 of this Certificate.
Regulation:	30(a)	Stability
Comment:		Walls designed for, and constructed from, the product can satisfy this Regulation. See sections 4, 6.1 and 6.2 and the <i>Installation</i> part of this Certificate.
Regulation:	35	Internal fire spread – Structure
Regulation:	36(a)	External fire spread
Comment:		The product can contribute to a construction satisfying these Regulations. See sections 9.1 to 9.3 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Comment:		Walls designed for, and constructed from, the product will contribute to limiting heat loss through the walls. See section 7.1 of this Certificate.
Regulation:	40(2)	Target carbon dioxide emission rate
Comment:		Walls designed for, and constructed from, the product can contribute to satisfying this Regulation. See section 7.1 of this Certificate.
Regulation:	49	Protection against sound from other parts of the building and from adjoining buildings
Comment:		Walls designed for, and constructed from, the product can satisfy this Regulation. See sections 8.1 and 8.4 of this Certificate.
Regulation:	50(a)	Protection against sound within a dwelling or room for residential purposes
Comment:		Walls designed for, and constructed from, the product may be used to satisfy this Regulation. See sections 8.1 and 8.4 of this Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 1 *Description* (1.2) and 3 *Delivery and site handling* (3.1) of this Certificate.

Additional Information

NHBC Standards 2018

In the opinion of the BBA, Airtec XL, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapters 5.1 *Substructure and ground bearing floors*, 6.1 *External masonry walls* and 6.3 *Internal walls*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 771-4 : 2011. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Constructive Details Ltd

The blocks described in this Certificate have been included in an assessment of thermal bridging details from Constructive Details Ltd (CDL). The handbooks containing these details are free to download from CDL's website at www.constructivedetails.co.uk.

Technical Specification

1 Description

1.1 Airtec XL is a general purpose Aircrete block comprising cement, lime and pulverised fuel ash, with aluminium powder used as an aerating agent.

1.2 The characteristics are given in Table 1 and the dimensions in Table 2.

Table 1 Characteristics

Characteristic (unit)	Value
Gross dry density* ($\text{kg}\cdot\text{m}^{-3}$)	460
Dry density range ($\text{kg}\cdot\text{m}^{-3}$)	410 to 510
Mean compressive strength* ($\text{N}\cdot\text{mm}^{-2}$)	2.9
Minimum individual block compressive strength ($\text{N}\cdot\text{mm}^{-2}$)	2.32

Table 2 Dimensions

Block type	Face size (mm)	Thickness (mm)
Airtec XL ⁽¹⁾	620 x 215	100 to 215 ⁽²⁾

(1) Also available with a thickness of 75 mm and in large format of 620 x 430 x 100 mm.

(2) The typical weight of a 620 x 215 x 100 mm block is 6.3 kg (at typical moisture content when laid).

1.3 Coursing units are also available.

2 Manufacture

2.1 The blocks are manufactured by mixing the raw materials into a slurry, discharging into moulds and, when set, cutting into blocks. The blocks are cured in autoclaves before packaging.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Thomas Armstrong (Concrete Blocks) Ltd has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by the BSI (Certificate FS 665648).

3 Delivery and site handling

3.1 The blocks are supplied shrink-wrapped in standard packs or banded to pallets (by order) for off-loading by mechanical grab or fork-lift truck.

3.2 The blocks must be stored clear of the ground on a firm, level surface and protected from rain and water from the ground. 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 Airtec XL.

4 Use



4.1 Airtex XL blocks are satisfactory 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.

4.2 The blocks comply with the requirements of BS EN 771-4 : 2011.

4.3 The blocks should be specified in accordance with BS EN 771-4 : 2011 and BS 6073-2 : 2008.

4.4 Walls must be designed and constructed in accordance with BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006 and their UK National Annexes, and PD 6697 : 2010.

5 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

6 Strength and stability

General



6.1 Coursing should be set out so that bearings are not less than 100 mm in length or the length required by the design calculation, whichever is the greater. 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



6.2 Increased local stresses may be permitted in the masonry provided that 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 EN 1996-1-1 : 2005, clause 6.1.3 and its UK National Annex.

6.3 For low-rise buildings, the design of masonry walls should be in accordance with BS 8103-2 : 2013.

6.4 Joist hangers may be used provided that:

- when designed in accordance with BS EN 1996-1-1 : 2005 and its UK National Annex and/or PD 6697 : 2010, the full effect of the maximum eccentric load at the joist hanger detail is taken into account. It should be assumed that joist hangers are not effectively rigid when calculating the local bearing stress under single hangers, and the effective load applied via the hanger should be determined by an acceptable elastic theory
- they are compatible with Aircrete blocks with mean compressive strengths* of $2.9 \text{ N}\cdot\text{mm}^{-2}$ or above. The dimensions used in the design and the manufacture from appropriate materials are set out in BS EN 845-1 : 2013 and BS EN 1996-2 : 2006, Annex C, Table C1 and its UK National Annex
- supervision and quality of work⁽¹⁾ are adequate to ensure that:
 - installation is in accordance with the hanger manufacturer's instructions
 - the masonry 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 the BRE Good Building Guide 21 (1996) : Joist hangers.

6.5 The characteristic initial shear strength of designed masonry mortars in combination with the blocks must be as follows, in accordance with BS EN 998-2 : 2016:

- $0.15 \text{ N}\cdot\text{mm}^2$ for general purpose and lightweight mortar
- $0.3 \text{ N}\cdot\text{mm}^2$ for thin layer mortar.

6.6 Flexural strength values f_{xk1} and f_{xk2} to be used for general purpose mortars are given in BS EN 1996-1-1 : 2005 and its UK National Annex, Table NA.6.

7 Thermal performance



7.1 Thermal transmittance (U value) calculations of walls should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report BR 443 : 2006. The conductivity of the blocks should be taken as $0.09 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ for 'protected blockwork', $0.10 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ for external blockwork exposed (eg not protected by a cladding system) or below dpc but above ground level, and $0.17 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ for blockwork below ground level.

7.2 Walls incorporating the blocks will need to incorporate thermal insulation as necessary to achieve or improve on (as appropriate) the following mean design U values specified in:

England — 0.18 - 0.35 W·m⁻²·K⁻¹

Wales — 0.15 - 0.35 W·m⁻²·K⁻¹

Scotland — 0.19 - 0.30 W·m⁻²·K⁻¹

Northern Ireland — 0.26 - 0.35 W·m⁻²·K⁻¹

7.3 The products can contribute to maintaining continuity of thermal insulation at junctions between elements and around openings. Guidance on limiting heat loss by air infiltration can be found in the documents supporting the national Building Regulations.

7.4 Further information can be found in the NHBC Foundation's *A practical guide to building airtight dwellings* (NF16) (September 2010).

8 Sound insulation

Walls flanking a separating wall or floor



8.1 The blocks can form the inner leaf of an external masonry cavity wall where any leaf surface mass, excluding finishes, is acceptable, eg where a separating wall is not present, as described in:

England and Wales — Approved Document E, sections 2 and 3

Northern Ireland — Technical Booklet G, sections 2 and 3.



8.2 The blocks can form the inner leaf of an external masonry wall flanking a Type 2 separating wall without a flanking floor and with a minimum block density of 450 kg·m⁻³, as described in the Building Standards Division Publication *Example construction and generic internal constructions*, section *Generic Internal Constructions*, referred to in the Technical Handbooks, clause 5.1.3.

Internal walls — new buildings and conversions



8.3 Internal walls between a bedroom or a room containing a toilet and other rooms (England and Wales), or between an apartment in a dwelling and a room in a residential building capable of being used for sleeping, are acceptable as follows:

England and Wales — a wall type D described in Approved Document E, paragraph 5.20, and a wall meeting the minimum sound insulation values in Approved Document E, Table 0.2

Scotland — wall types 4 and 4A as described in the *Generic Internal Constructions* referred to in the Technical Handbooks, clause 5.2.2, and a wall meeting the minimum sound insulation values given in the Technical Handbooks, clause 5.2.1.



8.4 The blocks can form an internal partition abutting a Type 1, 2 or 4 separating wall or a Type 1 or 2 separating floor if the minimum surface mass, excluding finishes, of the partition is not less than 120 kg·m⁻². Guidance on circumstances (eg where a separating floor is not present) where any surface mass can be acceptable can be found in:

England and Wales — Approved Document E, sections 2 and 3

Northern Ireland — Technical Booklet G, sections 2 and 3.

9 Properties in relation to fire



9.1 The fire resistance of walls constructed with Aircrete masonry can be determined by reference to:

- BS EN 1996-1-2 : 2005, Annex B, Table NB 4.6, and its UK National Annex, Tables NA 4.1, NA 4.2 and NA 4.6
- BRE Report BR 128 : 1988.

9.2 The blocks have a reaction to fire classification of A1* in accordance with BS EN 13501-1 : 2007 and are classified as 'non-combustible' as defined in the national Building Regulations.

9.3 With regard to the placing of cavity barriers, the surface of the blocks may be taken as Class 0.

9.4 The fire performance and suitability of wall ties and anchors for a specific construction should be confirmed with the manufacturer of those products.

10 Use below the damp-proof course



10.1 The blocks are resistant to the freeze-thaw conditions likely to occur below the damp-proof course and are suitable for use in situations up to and including MX3.2 as defined in BS EN 1996-2 : 2005, Annex A, Table A1 and its UK National Annex.

10.2 The blocks are suitable for use in classes DS1 and DS2 of soil or groundwater as defined in BRE Special Digest 1 : 2005 *Concrete in aggressive ground, Part C Assessing the aggressive chemical environment*.

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

11 Resistance to moisture



11.1 Walls built from the blocks should be designed and constructed in accordance with:

England and Wales — Approved Document C

Scotland — Mandatory Standard 3.10, clauses 3.10.1 to 3.10.4 and 3.10.6

Northern Ireland — Technical Booklet C.

11.2 For single-leaf constructions, the minimum block thicknesses to be used in solid rendered external walls are given in Table 3.

Table 3 Minimum block thickness⁽¹⁾

Exposure ⁽²⁾	Minimum block thickness (mm)
Severe	215
Moderate	190
Sheltered	90

(1) Increased thicknesses may be necessary to meet other requirements such as structural stability, or thermal or sound insulation (see sections 4.4, 6, 7 and 8).

(2) Exposure as defined in PD 6697 : 2010.

12 Condensation risk



12.1 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $0.7 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ ($1.2 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ in Scotland) at any point and the junctions with floors, roof and openings comply with section 7.3.



12.2 Walls will adequately limit the risk of interstitial condensation when they are constructed in accordance with BS 5250 : 2011 (Section 4 and Annexes D and G). For the purpose of calculations, the block's water vapour resistance factor (μ) may be taken as 10 (a resistivity of $50 \text{ MN}\cdot\text{s}^{-1}\cdot\text{g}^{-1}\cdot\text{m}^{-1}$), as given in BS EN ISO 10456 : 2007, Table 4.

12.3 The water vapour resistance (μ) for the block is $5^{(1)}/10^{(2)}$ in accordance with BS EN 1745 : 2012.

(1) The diffusion behaviour is into a building block.

(2) The diffusion behaviour is out of the building block.

12.4 Additional guidance can be found in BRE Report BR 262 : 2002.

13 Movement

13.1 The maximum declared moisture movement* of the blocks may be taken as a nominal value of $0.4 \text{ mm}\cdot\text{m}^{-1}$.

13.2 Movement may be accommodated using movement joints or bed joint reinforcement, or a combination of the two. When bed joint reinforcement is intended to contribute towards accommodation of movement, it should be designed and installed strictly in accordance with the Certificate holder's instructions.

13.3 Movement joints must be provided in accordance with clause 2.3.4 of BS EN 1996-2 : 2006 and clause NA.2.1 of its UK National Annex; Table NA.1 of PD 6697 : 2010; and the Certificate holder's instructions.

14 Maintenance

As the blocks are generally concealed and have suitable durability (see section 15), maintenance is not required.

15 Durability



Autoclaved aerated concrete (Aircrete) is a durable material. Walls constructed from the product will have durability equivalent to those of traditional masonry and will fulfil their intended function for the life of the building in which they have been installed.

Installation

16 General

16.1 Installation of Airtec XL blocks must be carried out strictly in accordance with BS 8000-3 : 2001, the Certificate holder's instructions and this Certificate.

16.2 Mortar must not be stronger than the blocks, as defined by either:

- BS EN 1996-1-1 : 2005 and its UK National Annex, Table NA.2, or
- PD 6697 : 2010, Table 15.

17 Chasing

17.1 The maximum depth of horizontal and vertical chases allowed without calculation is given in clauses 8.6.1 to 8.6.3 of BS EN 1996-1-1 : 2005 and Tables NA.11 and NA.12 of its UK National Annex.

17.2 In accordance with BS EN 1996-1-2 : 2005, vertical chases in the 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.

18 Rendering and plastering

Rendering and plastering must be carried out in accordance with BS EN 13914-1 : 2016 and BS EN 13914-2 : 2016. The Certificate holder should be consulted regarding suitable finishes and low water vapour permeability renders. The moisture condition of the blocks should be considered before the finishes are applied.

19 Fixings

19.1 Cut nails or proprietary nails may be used for lightweight fixtures. Screws and plugs, nailable expansion fixings or helical fixings should be used for heavier fixtures. All fixings must penetrate to a minimum depth of 50 mm into the blocks.

19.2 Fixings must be selected and installed in accordance with the fixing manufacturer's instructions, paying particular attention to drilling depth, drill bit diameter, minimum spacings and minimum edge distance.

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

Technical Investigations

20 Tests

20.1 Tests were conducted on Airtec XL blocks and the results assessed to determine:

- drying shrinkage
- density
- compressive strength
- dimensional accuracy
- thermal properties
- behaviour in fire
- risk of condensation and pattern staining
- assessment of freeze-thaw resistance.

20.2 An assessment was made of the durability of the products, based upon data leading to the issue of previous Agrément Certificates.

21 Investigations

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

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

Bibliography

- BRE Report BR 128 : 1988 *Guidelines for the construction of fire-resisting structural elements*
- BRE Report BR 262 : 2002 *Thermal performance : avoiding risks*
- BRE Report BR 443 : 2006 *Conventions for U-value calculations*
- BRE Special Digest 1 : 2005 *Concrete in aggressive ground*
- BS 5250 : 2011 *Code of practice for control of condensation in buildings*
- BS 6073-2 : 2008 *Precast concrete masonry units — Guide for specifying precast concrete masonry units*
- BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*
- BS 8103-2 : 2013 *Structural design of low-rise buildings — Code of practice for masonry walls for housing*
- BS EN 771-4 : 2011 *Specification for masonry units — Autoclaved aerated concrete masonry units*
- BS EN 845-1 : 2013 *Specification for ancillary components for masonry — Wall ties, tension straps, hangers and brackets*
- BS EN 998-2 : 2016 *Specification for mortar for masonry — Masonry mortar*
- BS EN 1745 : 2012 *Masonry and masonry products — Methods for determining thermal products*
- BS EN 1996-1-1 : 2005 *Eurocode 6: Design of masonry structures — General rules for reinforced and unreinforced masonry structures*
- NA to BS EN 1996-1-1 : 2005 UK National Annex to Eurocode 6: Design of masonry structures — General rules for reinforced and unreinforced masonry structures
- BS EN 1996-1-2 : 2005 *Eurocode 6: Design of masonry structures — General rules — Structural fire design*
- NA to BS EN 1996-1-2 : 2005 UK National Annex to Eurocode 6: Design of masonry structures — General rules — Structural fire design
- BS EN 1996-2 : 2006 *Eurocode 6: Design of masonry structures — Design considerations, selection and execution of masonry*
- NA to BS EN 1996-2 : 2006 UK National Annex to Eurocode 6: Design of masonry structures — Design considerations, selection and execution of masonry
- BS EN 1996-3 : 2006 *Eurocode 6 — Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*
- NA to BS EN 1996-3 : 2006 UK National Annex to Eurocode 6 — Design of masonry structures — Simplified calculation methods for unreinforced masonry structures
- BS EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*
- BS EN 13914-1 : 2016 *Design, preparation and application of external rendering and internal plastering — External rendering*
- BS EN 13914-2 : 2016 *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 : 2015 *Quality management systems — Requirements*
- BS EN ISO 10456 : 2007 *Building materials and products — Hygrothermal properties — Tabulated design values and procedures for determining declared and design thermal values*
- Constructive Details A Handbook of thermal bridging details incorporating aircrete blocks:
Book 1 *Thermal bridging solutions for external wall partial fill cavity details and full fill party wall details*
Book 2 *Thermal bridging solutions for external wall full fill cavity details*
Book 3 *Thermal bridging solutions for externally insulated solid wall details*
- PD 6697 : 2010 *Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2*

22 Conditions

22.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
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22.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and 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.

22.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

22.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

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