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Agrément Certificate
14/5145
Product Sheet 1

NBT CONSTRUCTION SYSTEMS

NBT THERMOPLAN SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the NBT Thermoplan System, a thin-bed clay block, render and coating system for use in the construction of external solid loadbearing walls above damp-proof course (dpc) level.

(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

Thermal performance — the thermal conductivity (λ value) of the blocks may be taken as $0.09 \text{ m}^{-1} \cdot \text{K}^{-1}$ *(see section 6).

Strength and stability — the system has adequate resistance to impact damage and cracking. The blocks have a mean compressive strength of $7.5 \text{ N} \cdot \text{mm}^{-2}$ * 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 7).

Performance in relation to fire — the render and coating system has achieved an A2-s1, d0 surface spread of flame classification in accordance with BS EN 13501-1 : 2007 and the blocks have a reaction to fire Class A1 (see section 8).

Weather resistance — the system resists water penetration and can be used in all exposure zones including 'very severe' category in accordance with PD 6697 : 2010 (see section 9).

Durability — when installed and maintained in accordance with the Certificate holder's recommendations and this Certificate, the render and coating system is expected to have a life in excess of 30 years (see section 14).

The BBA has awarded this Certificate to the company named above for the system described herein. This system 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

Simon Wroe
Head of Approvals — Materials

Claire Curtis-Thomas
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, the NBT Thermoplan System, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting 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
Comment:	Walls built from the system are capable of meeting this Requirement. See sections 4.3, 11.1 and 11.2 of this Certificate.
Requirement: B3(1)(2)	Internal fire spread (structure)
Comment:	The system can contribute to meeting this Requirement. See section 8 of this Certificate.
Requirement: B4(1)	External fire spread
Comment:	The system can meet or contribute to meeting this Requirement. See section 8 of this Certificate.
Requirement: C2(b)	Resistance to moisture
Comment:	Walls built with the system can satisfy this Requirement. See sections 4.3, 9.1 and 9.4 of this Certificate.
Requirement: C2(c)	Resistance to moisture
Comment:	Walls designed and constructed from the system will contribute to limiting the risk of condensation. See section 10 of this Certificate.
Requirement: L1(a)(i)	Conservation of fuel and power
Comment:	The system can contribute to meeting this Requirement. See sections 6.2 to 6.4 of this Certificate.
Regulation: 7	Materials and workmanship
Comment:	The system is acceptable. See section 14 and the <i>Installation</i> part of this Certificate.
Regulation: 26	CO₂ emission rates for new buildings
Comment:	The system can contribute to meeting this Regulation when compensating fabric and/or service measures are taken. See section 6.2 to 6.4 of this Certificate.
Regulation: 26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Comment:	The system can contribute to meeting this Regulation when compensating fabric measures are taken. See section 6.2 to 6.4 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation: 8(1)(2)	Durability, workmanship and fitness of materials
Comment:	The system can contribute to a construction meeting this Regulation. See sections 13 and 14 and the <i>Installation</i> part of this Certificate.
Regulation: 9	Building standards applicable to construction
Standard: 1.1	Structure
Comment:	Walls constructed from the system can comply with this Standard, with reference to clause 1.1.1 ⁽¹⁾⁽²⁾ . See sections 4.3, 11.1 and 11.2 of this Certificate.
Standard: 2.3	Structural protection
Standard: 2.6	Spread to neighbouring buildings
Standard: 2.7	Spread on external walls
Comment:	The render and blocks are classified as 'non-combustible' and are therefore unrestricted by these Standards, with reference to clauses 2.3.1 ⁽¹⁾⁽²⁾ , 2.3.5 ⁽¹⁾⁽²⁾ , 2.6.1 ⁽¹⁾⁽²⁾ , 2.6.4 ⁽¹⁾⁽²⁾ , 2.6.5 ⁽¹⁾⁽²⁾ , 2.6.6 ⁽²⁾ and 2.7.1 ⁽¹⁾⁽²⁾ . See section 8 of this Certificate.
Standard: 3.10	Precipitation
Comment:	The system can satisfy the requirements of this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ , 3.10.2 ⁽¹⁾⁽²⁾ and 3.10.3 ⁽¹⁾⁽²⁾ . See sections 4.3, 9.1 and 9.4 of this Certificate.
Standard: 3.15	Condensation
Comment:	Walls designed and constructed using the system can contribute to satisfying this Standard, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.4 ⁽¹⁾⁽²⁾ and 3.15.5 ⁽¹⁾⁽²⁾ . See section 10 of this Certificate.
Standard: 6.1(b)	Carbon dioxide emissions
Standard: 6.2	Building insulation envelope
Comment:	Walls designed and constructed from the system 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 sections 6.2 to 6.4 of this Certificate.
Standard: 7.1(a)(b)	Statement of sustainability
Comment:	The system 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. In addition, the system can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾], 7.1.6 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾] and 7.1.7 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾]. See sections 6.2 to 6.4 of this Certificate.
Regulation: 12	Building standards applicable to conversions
Comment:	All comments given for this system 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

Regulation:	23(a)(b)	Fitness of materials and workmanship
Comment:		The system is acceptable. See section 14 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The system will contribute to meeting this Regulation. See sections 4.3, 9.1 and 9.4 of this Certificate.
Regulation:	29	Condensation
Comment:		The system can contribute to limiting the risk of condensation. See section 10 of this Certificate.
Regulation:	30(a)	Stability
Comment:		Walls designed and constructed from the system can meet this Regulation. See sections 4.3, 11.1 and 11.2 and the <i>Installation</i> part of this Certificate.
Regulation:	35(1)(2)	Internal fire spread (structure)
Regulation:	36(a)	External fire spread
Comment:		The system can contribute to a construction meeting this Regulation. See section 8 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Comment:		Walls designed and constructed from the system can contribute to limiting heat loss through walls. See sections 6.2 to 6.4 of this Certificate.
Regulation:	40(2)	Target carbon dioxide Emissions Rate
Comment:		Walls designed and constructed from the system can contribute to meeting this Regulation. See sections 6.2 to 6.4 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 section: 3 *Delivery and site handling* and 16 *Mixing* (16.3) of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of the NBT Thermoplan System, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards, Part 6 Substructure (excluding roofs), Chapter 6.1 External masonry walls*.

CE marking

The Certificate holder has taken the responsibility of CE marking the ZV09 blocks in accordance with harmonised European Standard BS EN 771-1 : 2011 and the Baunit Bayosan FL68, Baunit MC 55 W and Baunit Bayosan Decor Finishes SEP 01, 02, 03 and 04 in accordance with BS EN 998-1 : 2010. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 The NBT Thermoplan System consists of Thermoplan ZV9 clay-fired blocks finished with a mesh-reinforced render system. The blocks have the following specification:

- length (mm) — 247
- width (mm) — 365, 425
- height (mm) — 249
- gross dry density ($\text{kg}\cdot\text{m}^{-3}$) — 630*
- dry density range ($\text{kg}\cdot\text{m}^{-3}$) — 610 - 650*
- mean compressive strength ($\text{N}\cdot\text{mm}^{-2}$) — 7.5*
- thermal conductivity ($\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$) — 0.09*.

1.2 The blocks are used with Baunit Dünnbettmörtel Type III, a thin-bed mortar for horizontal joints, and Glasgitter Weiss, a reinforcing mesh available in a range of widths to suit the wall thickness.

1.3 The render system consists of:

- Baunit Bayosan FL68 — a basecoat render
- Baunit DG 27 — a basecoat primer used with Baunit Bayosan FL68 as a bonding agent prior to the application of the topcoat render
- Baunit MC 55 W — an intermediate render incorporating a polypropylene mesh for use in very severe and severe exposure zones

- Baunit Bayosan Decor Finishes SEP 01, 02, 03 and 04 — a range of top coat renders with various aggregate sizes ranging from 1 to 4 mm, available in a range of colours
- SilikonColour — a silicon paint finish available in a range of colours.

1.4 Baunit Bayosan LM21 is used to bond and repair vertical joints in cut blocks and as a repair mortar. This product is outside the scope of this Certificate.

2 Manufacture

2.1 The blocks are manufactured by an extrusion process to produce a column of clay which is then sliced by an automatic cutter to create individual bricks. The wet bricks are dried in a chamber before being fired in a kiln. The render products are manufactured by batch blending measured quantities of component materials.

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 the render manufacturer has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by TUV (Certificates 12 100 6767 TMS and 12 100 104 6767 TMS).

3 Delivery and site handling

3.1 The blocks are supplied shrink-wrapped in standard packs, suitable for off-loading with mechanical grabs or fork-lift trucks, and must be stored clear of the ground on a firm, level surface protected from rain and ground water. The shrink-wrapping should be left in place until the blocks are required for use.

3.2 Baunit Bayosan FL68, Baunit MC 55 W and SEP 01, 02, 03 and 04 are delivered in paper sacks weighing 30 kg, 25 kg and 25 kg respectively. Each sack is printed with the date and time of manufacture and batch number. The products are cementitious materials and must be stored in dry conditions, off the ground, in a secure store and protected from frost. To avoid 'warehouse set' caused by compaction, the height of bags stacked on a pallet must not exceed one metre and no more than four pallets should be stacked. Renders should be used in the order in which they are received and each delivery should be kept separate to avoid confusion. When stored unopened the products have a shelf-life of 6 months from the date of manufacture.

3.3 Baunit Bayosan FL68, Baunit MC 55 W and SEP 01, 02, 03 and 04 are classified as 'irritant', under *The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (CHIP4)/Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation) 2009*. The cementitious materials must be handled using the routine precautions for Portland cement.

3.4 The reinforcing mesh is supplied in rolls 50 m long by 1 m wide.

3.5 Baunit DG 27 is supplied in 10 litre plastic tubs. SilikonColour paint is supplied in 5 and 25 litre plastic tubs. The products have a shelf-life of 12 months, and must be protected from frost on site and during transit.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the NBT ThermoPlan System.

Design Considerations

4 Use

4.1 The NBT ThermoPlan System is satisfactory for use in the construction of external load bearing walls above the damp-proof course.

4.2 The ThermoPlan ZV9 blocks are manufactured to comply with the requirements of BS EN 771-1 : 2011.

 4.3 Walls must be designed and constructed in accordance with the relevant recommendations of PD 6697 : 2010, BS EN 1996-2 : 2006 and its UK National Annex, and BS EN 13914-1 : 2005. The designer should select a construction appropriate to its location, paying due attention to design, detailing and workmanship and the materials to be used.

4.4 It is essential that walls are designed and constructed to prevent moisture penetration and the formation of condensation.

4.5 The render system has only been assessed for use on ThermoPlan ZV9 blocks. Use on other substrates is outside the scope of this Certificate.

4.6 The effect of the installation of the system on the acoustic performance of a construction is outside the scope of this Certificate.

5 Practicability of installation

The system should only be installed by installers who have been trained and approved by the Certificate holder.

6 Thermal performance

6.1 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE Report BR 443 : 2006. For the purpose of calculation, the thermal conductivity (λ value) of the blocks may be taken as $0.09 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.

Table 1 External wall thermal properties

Property	Value	
Block thickness (mm)	365	425
Thermoplan ZV9 blocks ($\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$)	0.09	0.09
Mortar % (thin-joint 1 mm joint)	0.4 ⁽¹⁾	0.4 ⁽¹⁾

(1) Mortar conductivity may be taken as $0.88 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$.



6.2 The U values of the 365 mm and 425 mm blocks are $0.23 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ and $0.20 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$ respectively.

6.3 Walls constructed from the blocks may need to incorporate thermal insulation as necessary to achieve, or improve on, the following 'mean' design U values specified in:

England – 0.18 to $0.35 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$

Scotland – 0.19 to $0.30 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$

Northern Ireland – 0.26 to $0.35 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$.

6.4 The system 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:

England and Wales – Accredited Construction Details (version 1.0)

Scotland – Accredited Construction Details (Scotland)

Northern Ireland – Accredited Construction Details (version 1.0).

7 Strength and stability

7.1 The blocks have the compressive strength given in section 1.1.

7.2 Compressive and flexural design strengths should be calculated in accordance with BS EN 1996-1-1 : 2005, BS EN 1996-2 : 2006 and PD 6697 : 2010.

7.3 The render has adequate resistance to impact damage and cracking.

7.4 It is essential that the Thermoplan ZV9 blocks are clean and have a sound mechanical key to ensure a satisfactory bond between the substrate and the render.

8 Performance in relation to fire



8.1 When tested on a calcium silicate board substrate and classified in accordance with BS EN 13501-1 : 2007, a system comprising:

- Baunit FL68 Basecoat
- Baunit MC55W intermediate render coat with reinforcing mesh
- DG27 primer
- Baunit SEP topcoat render
- a white silicon paint finish

achieved a reaction to fire classification of A2-s1, d0. This classification applies to the full range of finish paint colours.

8.2 Requirements under the various national Building Regulations are:

England, Wales and Northern Ireland – the render is considered suitable for use on or at any distance from the boundary, provided the wall meets the fire resistance requirements in Table A2

Scotland – the render is classified as non-combustible.

8.3 The blocks and mortar have a reaction to fire Class A1 to BS EN 13501-1 : 2007 and are classified as non-combustible as defined in the national Building Regulations.

8.4 When tested to BS EN 1365-1 : 1999, a 365 mm thick block incorporating a 20 mm thickness of external render and a 15 mm internal plaster layer achieved a fire resistance classification of REI 90 (F90-A) to BS EN 13501-2 : 2007.

9 Weather resistance



9.1 The system resists water penetration and can be used in all exposure zones including 'very severe' category as defined in table 13 and 14 in PD 6697 : 2010. The local wind-driven rain index should be calculated in accordance with BS 8104 : 1992.

9.2 Walls must be designed and constructed in accordance with local exposure conditions to minimise the incidence of rain penetration.

9.3 The render will tend to shed water and will considerably reduce the amount of water absorbed during rain.



9.4 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⁽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.

10 Risk of condensation



10.1 Designers must ensure that an appropriate condensation risk analysis has been carried out for all parts of construction, including openings and penetrations. The recommendations of BS 5250 : 2011 should be followed.

10.2 The system will adequately limit the risk of 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, roofs and openings comply with sections 6.2 and 6.3.

10.3 The system will adequately limit the risk of interstitial condensation when used in walls constructed in accordance with BS 5250 : 2011 (Section 4 and Annexes D and G).

11 Structural aspects

General



11.1 Construction must be in accordance with BS EN 1996-1-1 : 2005, BS EN 1996-2 : 2006 and PD 6697 : 2010. Coursing should be set out such that bearings are not less than 100 mm in length or the length required by the design calculation, whichever is greater. Where possible the masonry should be set out to provide a full block under a bearing. Thermoplan lintels should be used with the system, and should have a minimum bearing of 125 mm. Blockwork above the lintel should be fully mortared within the compression zone as per the Certificate holder's instructions.

Concentrated loads

11.2 Increased local stresses may be permitted in the masonry provided that the member applying the load is suitably 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.

11.3 Joist hangers may be used provided that:

- when designing 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 according to a recognised acceptable elasticity theory
- they are compatible with products of average compressive strengths greater than $7.5 \text{ N}\cdot\text{mm}^{-2}$. The dimensions used in the design and the manufacture from appropriate materials are set out in BS EN 845-1 : 2003 and BS EN 1996-2 : 2006, Table C1 and its UK National Annex
- supervision and workmanship⁽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
 - there is no gap between the end of the joist and the back plate
 - 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 has set before any load is applied to the hanger.

(1) Further guidance may be obtained from BRE Good Building Guide 21 (1996) *Joist hangers*.

12 Movement

12.1 Movement may be accommodated using movement joints or bed joint reinforcement, or a combination of the two. Bed joint reinforcement should be designed and installed strictly in accordance with the Certificate holder's instructions.

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

12.3 In external walls containing openings, movement joints may need to be provided at more frequent intervals, or the masonry above and below the opening may need to be reinforced to restrain movement. Particular attention should be paid to long, low horizontal runs of masonry, eg those under windows.

13 Maintenance

 13.1 Regular maintenance checks should be carried out on external plumbing and fittings to ensure that they are functioning correctly and to prevent water penetration into the constructed wall. The render may be discoloured by water runs, and care should be taken to ensure that normal architectural details for shedding water clear of the building are present and functioning, and that gutters and downpipes are in good condition.

13.2 As the blocks are concealed and have suitable durability, maintenance is not required.

14 Durability

 14.1 Clay-fired blocks such as Thermoplan ZV9 are durable materials. Unexposed sections of walls which have been constructed from the blocks and which are above the damp-proof course will have a 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.

14.2 The render and coating, when applied to the blocks, will perform satisfactorily for a period in excess of 30 years, provided that any damage to the surface finish is repaired immediately and regular maintenance is undertaken. This should include checks on joints and on external plumbing fittings to identify leakage of rainwater into the system, enabling steps to be taken to correct defects if necessary.

14.3 The render may become discoloured with time, the rate depending on the local environment. Appearance can normally be restored by cleaning with water, mild detergent and a stiff bristle brush. In industrial atmospheres light colours should be avoided.

14.4 In common with traditional renders the system may be subject to lime bloom. The occurrence of this may be reduced by providing adequate protection and avoiding application in winter or in adverse weather conditions. The effect is less noticeable on lighter colours.

14.5 There will be a gradual change in colour of the SilikonColour coating which will not be excessive, but the coating will be discoloured by water runs and care must be taken to ensure that normal architectural details for shedding water are present and functioning.

Installation

15 General

Blocks

15.1 Installation of the Thermoplan blocks must be carried out strictly in accordance with the provisions detailed in this Certificate and BS 8000-3 : 2001. Technical advice should be sought from the Certificate holder for particular installations, as required.

Wall construction

15.2 The thin-layer mortar (Baumit Dünnbettmörtel Type III) should be mixed according to the Certificate holder's instructions. Once mixed, the mortar should not be re-tempered and should be spread using the special tool supplied to provide a finished thickness of 1 mm ± 0.5 mm.

15.3 Bonded anchors should be fully bedded in and completely covered by thin-layer mortar.

15.4 The reinforcing mesh must not protrude over the edge of the blocks, and must be trimmed off or repositioned prior to mortar cure.

15.5 Subsequent courses of blocks must be positioned with the interlocking profiles no more than 5 mm apart. Joints larger than this (up to a maximum of 25 mm) must be filled with Baumit LM 21 insulation mortar.

Render

15.6 Prior to application of the render to the blocks a specification must be prepared for the building indicating:

- the position of beads
- detailing around windows and doors and at eaves
- damp-proof course (dpc) level
- exact position of expansion joints
- areas where flexible sealants must be used
- any alterations to external plumbing
- where required, the position of fire barriers.

15.7 Application of the render system must be carried out strictly in accordance with this Certificate, the Certificate holder's instructions and specifications, and the relevant recommendations of BS EN 13914-1 : 2005.

15.8 The system should not be applied in rain or mist, at temperatures below 5°C or above 35°C, or if exposure to frost is likely to occur during curing. In common with other sand/cement renders, the system must not be applied to frost-bound surfaces.

15.9 In sunny weather, work should commence on the shady side of the building and be continued round following the sun to prevent the render drying out too rapidly.

15.10 To minimise colour shade variations and avoid dry line jointing, continuous surfaces should be completed without a break. If breaks cannot be avoided they should be made where services or architectural features such as drainpipes, reveals or lines of doors and windows will help mask cold joints. Where long, uninterrupted runs are planned, bags of the material should be checked for batch numbers. Bags with different batch numbers should be checked for colour consistency.

16 Mixing

16.1 The system components are added to clean water at a rate of 5.5 to 6.5 litres of water per 25 kg of the product, and are thoroughly mixed using a drill and paddle or free fall mixer for a minimum of five minutes until the correct workability is achieved.

16.2 Baunit Primer DG27 must be thoroughly mixed using an electric hand mixer before application. Where required a minimal amount of water can be added to improve workability.

16.3 Where excessive concentrations of dust may accumulate, the measures defined in the Health and Safety Executive Publication EH40/2005 *Workplace exposure limits for unlisted substances* should be adhered to. It should be ensured that the current edition is being followed.

16.4 In common with traditional renders, slumping of the material may occur if the mix is too wet, and will increase the risk of settlement cracks developing.

16.5 The products will remain workable throughout the day, but may require re-mixing prior to application. They must not be remixed after they have begun to set.

17 Application

17.1 Render beads and expansion beads are fixed in accordance with the render bead supplier's instructions and the Certificate holder's recommendations.

17.2 The FL68 Basecoat render is applied by hawk and trowel or by spray onto the blocks to a thickness of 15 to 20 mm. Once stiffened the surface should be roughened using a grid float or similar and allowed to cure for 1 day per mm thickness applied.

17.3 For very severe and severe exposure zones, a coat of MC55 W is applied to a thickness of 5 mm and combed through with a brush while wet. The Glasgitter Weiss reinforcing glass mesh is embedded across the entire area of the basecoat, overlapping by 100 mm where necessary.

17.4 Baunit DG27 is then applied with a brush or roller and is left to dry for 24 hours before applying further coatings.

17.5 Baunit Bayosan Decor Finish SEP is then applied and painted with SilikonColour finish.

18 Curing

18.1 The products must be protected from rain, mist or cold (less than 5°C on a falling thermometer) conditions to prevent an excessively prolonged drying period.

18.2 The use of a hessian mesh is recommended during drying and curing when the render is exposed to direct sun, drying wind and rain. The hessian mesh should hang clear of the wall and be welted down in very hot situations.

19 Finishing

On completion of the installation, the surface must be checked to ensure an even coverage of render and textured finish.

20 Repair

Damage to the system must be repaired immediately in accordance with the relevant recommendations of BS EN 13914-1 : 2005 using conventional rendering techniques and materials. The advice of the Certificate holder should be sought for particular installations.

21 Fixings

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

22 Tests

22.1 Tests were carried out on the complete system and results assessed to determine the effect of:

- thermal cycling
- freeze/thaw
- accelerated ageing on impact resistance
- accelerated ageing on bond strength.

22.2 An assessment was made of test data on the blocks which included:

- density
- compressive strength
- dimensional accuracy
- thermal properties
- fire resistance.

22.3 Tests were carried out on the render system to determine water vapour permeability.

22.4 Tests were carried out on the paint finish to assess colour change following UV ageing and resistance to algal growth.

23 Investigations

23.1 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.

23.2 Visits were carried out to a site in progress to assess the practicability of installation.

23.3 A survey of known users of the system was conducted.

Bibliography

BS 5250 : 2011 *Code of practice for control of condensation in buildings*

BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*

BS 8104 : 1992 *Code of practice for assessing exposure of walls to wind-driven rain*

BS EN 771-1 : 2011 *Specification for masonry units — Clay masonry units*

BS EN 845-1 : 2003 *Specification for ancillary components for masonry — Ties, tension straps, hangers and brackets*

BS EN 998-1 : 2010 *Specification for mortar for masonry — Rendering and plastering mortar*

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 of materials and execution of masonry*

NA to BS EN 1996-2 : 2006 UK National Annex to *Eurocode 6 — Design of masonry structures — Design considerations, selection of materials 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 test data from reaction to fire tests*

BS EN 13501-2 : 2007 *Fire classification of construction products and building elements — Classification using data from fire resistance tests, excluding ventilation services*

BS EN 13914-1 : 2005 *Design, preparation and application of external rendering and internal plastering — External rendering*

BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — calculation method*

Conditions of Certification

24 Conditions

24.1 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
- 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.

24.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

24.3 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.

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

24.5 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:

- 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
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

24.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal 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, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue 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.