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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
07/4466
Product Sheet 1

STONE PANELS INC CLADDING PRODUCTS

STONELITE CLADDING PANELS

This Agrément Certificate Product Sheet(1) relates to StoneLite(2) Cladding Panels, for use as protective and decorative cladding on external and internal walls of buildings of masonry or steel frame construction.

(1) Hereinafter referred to as 'Certificate'.

(2) Stonelite is a registered trademark of Stone Panels Inc.

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 product will withstand the pressures imposed by wind forces likely to be experienced in the UK and have good impact resistance (see section 6).

Behaviour in relation to fire — a cladding system incorporating the product may be regarded as having a Class 0 surface or 'low risk' as defined in the Building Regulations (see section 7).

Weathertightness — the product minimises water penetration and the risk of damage to the inner wall (see section 8).

Durability — the product has adequate durability and should have a service life of over 60 years (see section 10).

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

Date of Second issue: 28 April 2016

Originally certificated on 30 November 2007

Brian Chamberlain
Head of Technical Excellence

Claire Curtis-Thomas
Chief Executive

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

Regulations

In the opinion of the BBA, StoneLite Cladding Panels, 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
Comment:		The product is acceptable for use as set out in sections 4.4 and 6.2 to 6.6 of this Certificate.
Requirement:	B2	Internal fire spread (linings)
Comment:		The product meets the Class 0 requirements. See sections 7.1 to 7.3 and 7.5 to 7.7 of this Certificate.
Requirement:	B4(1)	External fire spread
Comment:		The product meets the Class 0 requirements. See sections 7.1 to 7.3 and 7.5 to 7.7 of this Certificate.
Requirement:	C2(b)(c)	Resistance to moisture
Comment:		Cladding systems incorporating the product will resist the passage of rainwater to the supporting structure. See section 8 of this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The product is acceptable. See sections 10.1 and 10.2 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		The use of the product satisfies the requirements of this Regulation. See sections 9, 10.1 and 10.2 and the *Installation* part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	1.1(a)(b)	Structure
Comment:		The product is acceptable, with reference to clause 1.1.1[(1)(2)]. See sections 4.4 and 6.2 to 6.6 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The product can contribute to satisfying this Standard, with reference to clause 2.6.4[(1)(2)]. See section 7 of this Certificate.
Standard:	2.7	Spread on external walls
Comment:		The product can contribute to satisfying this Standard, with reference to clause 2.7.1[(1)(2)]. See section 7 of this Certificate.
Standard:	3.10	Precipitation
Comment:		Cladding systems incorporating the product will resist the passage of rainwater to the supporting structure, with reference to clauses 3.10.1[(1)(2)] to 3.10.3[(1)(2)]. See section 8 of this Certificate.
Standard:	7.1(a)	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)(ii)	Fitness of materials and workmanship
Comment:		The product is acceptable. See sections 10.1 and 10.2 and the *Installation* part of this Certificate.
Regulation:	28(b)	Resistance to ground moisture and weather
Comment:		Cladding systems incorporating the product are not watertight but will resist the passage of rainwater to the supporting structure. See section 8 of this Certificate.
Regulation:	30	Stability
Comment:		The product is acceptable as set out in sections 4.4 and 6.2 to 6.6 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The product meets the Class 0 requirements. See sections 7.1 to 7.3 and 7.5 to 7.7 of this Certificate.

Construction (Design and Management) Regulations 2015

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

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

See sections: 1 *Description* (1.1) and 3 *Delivery and site handling* (3.5) of this Certificate.

Additional Information

NHBC Standards 2016

NHBC accepts the use of StoneLite Cladding Panels, provided they are installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Part 6 *Superstructure (excluding roofs)*, Chapter 6.9 *Curtain walling and cladding*.

Technical Specification

1 Description

1.1 StoneLite Cladding Panels are composite panels comprising a solid natural stone veneer facing adhesively fixed to an aluminium alloy honeycomb core, with an attachment plate embedded within the honeycomb core. There are two models of panel available: SP-1-6-3 and SP-1-10-3, corresponding to a cell diameter of the aluminium honeycomb core of 6 mm and 10 mm respectively. The panels have a nominal overall thickness of 23.5 to 27.5 mm, depending on stone thickness and core (see Table 1 for composite panel specification).

Table 1 StoneLite Cladding Panel specification

Characteristic (unit)	Stone veneer	Glassfibre mesh and aluminium honeycomb
Maximum width (mm)	1500	1500
Maximum length (mm)	3000	3000
Thickness (mm)	4.5 to 8.5	19.3
Approximate mass per unit area ($kg \cdot m^{-2}$)	12 to 22[1]	–
Cell wall thickness (mm)	–	0.127

(1) Weight dependent on density and thickness of stone.

1.2 The panels incorporate the following components:

Facing

Composite panels are faced with 4.5 mm to 8.5 mm thick solid natural stone veneer. The facing is available in:

- limestone
- onyx
- dolomite
- sandstone
- marble
- travertine
- granite
- slate.

The stone veneers are available in polished, honed, flamed, sand-blasted and bush-hammered finishes. They are bonded to the core with epoxy resin adhesive.

Core

The panel core is made of 6 mm or 10 mm cell, aluminium alloy EN AW-3003 (Al Mn1Cu) honeycomb, temper H19 in accordance with BS EN 485-2 : 2013. This honeycomb core is faced on each side with a layer of epoxy resin-coated glassfibre mesh.

StoneLite attachment plate

Aluminium attachment plates, 88 mm square by 2 mm thick, with lugs, are bonded to the inner face and embedded in the honeycomb core with epoxy resin and are spaced at maximum centres of 600 mm. These provide fixing points for the mounting systems, which are outside the scope of this Certificate. The attachment plates incorporate fixing holes which are either circular, 7 mm in diameter, or slotted, 7 mm by 12 mm, depending on application.

1.3 Typical mountings on masonry walls and steel frame constructions are shown in Figures 1a and 1b.

Figure 1a Typical mounting detail on masonry walls

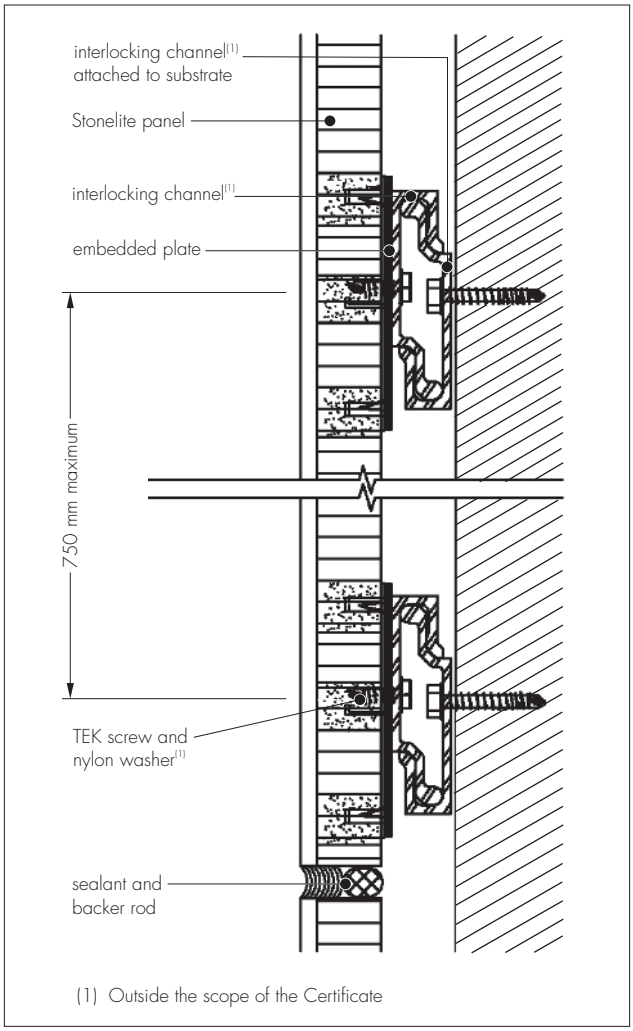
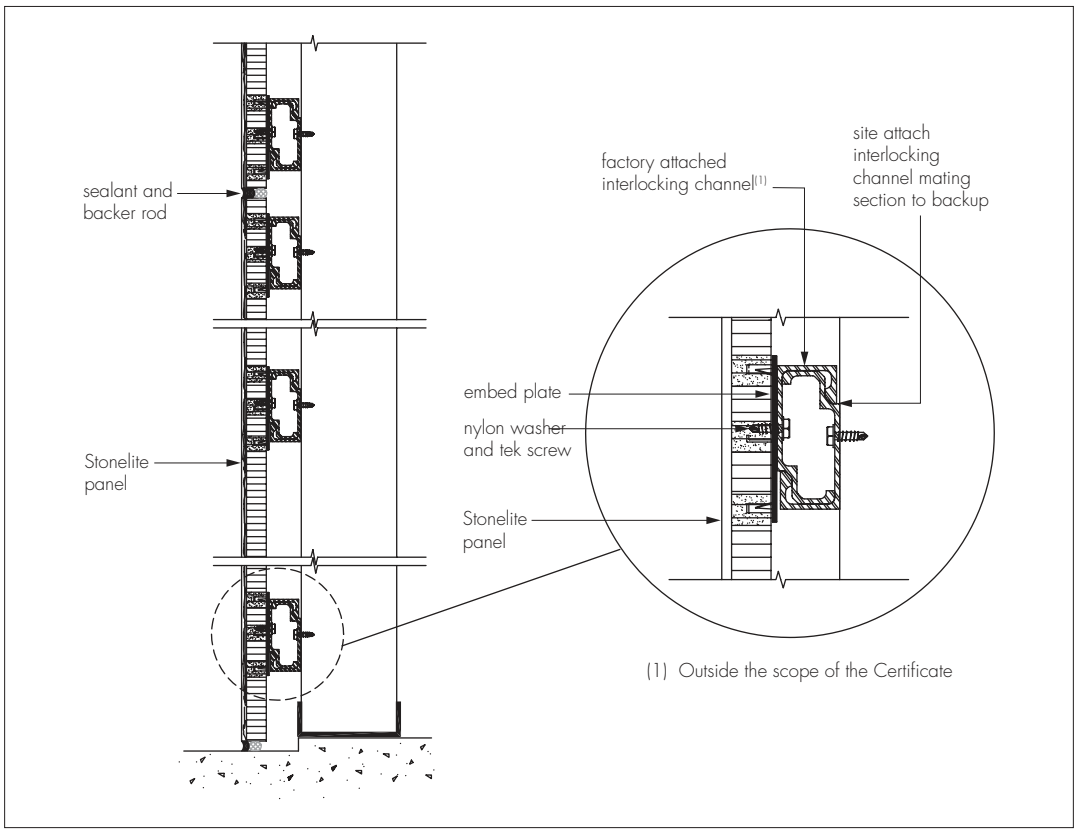


Figure 1b Typical mounting detail on steel frame constructions



1.4 Ancillary components for use with the system, but outside the scope of this Certificate, are:

- self-drilling screws — 5 mm diameter by 45 mm long stainless steel screws
- joint sealant
- joint backer rods
- cavity flashing.

2 Manufacture

2.1 The product is manufactured by lamination of the stone slabs to the aluminium honeycomb core, bonded on both sides to glassfibre mats. Aluminium attachment plates are installed to the inside of the panels.

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 product is manufactured in the USA and marketed in the UK by Brick-Works UK Ltd, International House, Brunel Drive, Newark, Nottinghamshire, NG24 2EG, United Kingdom, tel: 01636 612414, e-mail: brickwks@aol.com

3 Delivery and site handling

3.1 The panels are delivered to site packaged in wooden crates with steel strap banding. Each package bears a label showing product details such as the Certificate holder's name and address, and the BBA logo incorporating the number of this Certificate.

3.2 When stored on site, the panels must be protected from accidental damage and kept in a weatherproof environment. They should be unpacked in the order of installation to limit handling and minimise the risk of damage. Polished or honed stone panels can be manoeuvred using suction caps. Flamed, sand-blasted and bush-hammered panels require suitable lifting equipment.

3.3 The panels should be stored flat and level, clear of the ground and under cover, to prevent distortion.

3.4 When handling the panels, care should be taken to avoid damage to the surface or edges. Panels should be lifted away from, rather than slid across, underlying sheets.

3.5 When handling the panels, whether by mechanical plant or manual means, appropriate protective clothing should be worn and all Health and Safety regulations observed.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on StoneLite Cladding Panels.

Design Considerations

4 General

4.1 When installed in accordance with this Certificate, Stonelite Cladding Panels are satisfactory for use as protective and decorative cladding on external and internal walls of buildings of masonry or steel frame construction.

4.2 When planning a system incorporating StoneLite Cladding Panels, the building designer must determine the type of supporting framework, the number of fixings per panel and the type of fixings to be used (see section 6). Design guidance can be supplied by the Certificate holder.

4.3 Appropriate ventilation and drainage must be provided behind the cladding. A suitable vapour permeable layer must be used to protect the frame from water ingress (see sections 4.6, 4.8 and 8) and ventilation openings should be suitably protected or baffled to prevent the ingress of birds, vermin and rain.

4.4 The wall and the support frame to which the cladding is to be fixed should be structurally sound and constructed in accordance with the requirements of the relevant Building Regulations and European or National Standards.

4.5 The sub-frame and the support rails should be designed to limit mid-span deflections to L/200, and cantilever deflections to L/150. The maximum distance between frame members is 800 mm.

4.6 The walls to which the cladding is to be fixed should be watertight. Particular care must be taken to ensure that any water present in the cavity between the substrate wall and the cladding is deflected around any openings such as windows and doors.

4.7 Insulation behind the cladding needs to be suitably fixed to the inner leaf to resist wind suction. Insulation should be of a rigid type (eg boards or batts). The ventilation pathway behind the cladding must not be allowed to become blocked nor the insulation dislodged where it may be vulnerable to wetting.

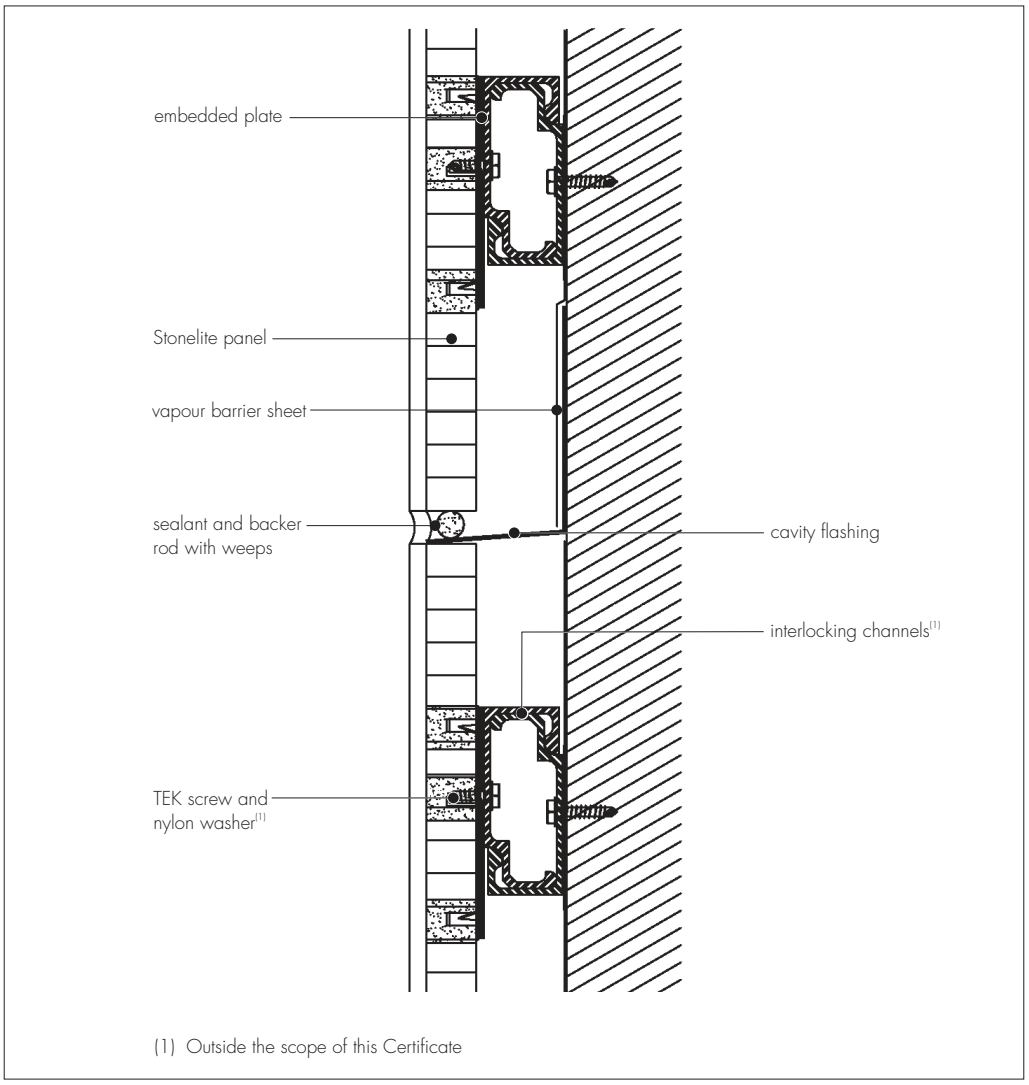
4.8 The cladding installation should ensure that water is prevented from reaching any part of the wall likely to be damaged by moisture.

4.9 Joint gaps may vary to provide adequate allowance for expansion.

4.10 The minimum joint gap to be provided between panels for thermal expansion is 3 mm per metre length of panel. The gap must not be covered by a panel.

4.11 The joint gap between panels is nominally 10 mm and is sealed with sealant and a backer rod (see Figure 2). Advice on the type of sealant to be used should be sought from the Certificate holder.

Figure 2 Typical panel-to-panel joint detail



4.12 All design aspects of the installation should be checked by a suitably-qualified engineer or other appropriately-qualified person.

5 Practicability of installation

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

6 Strength and stability

6.1 A suitably-qualified individual must ensure that the substrate wall is suitable, the support system is adequate and that an adequate number of suitable fixings are used to support each panel.

Loading

6.2 When installed in accordance with the requirements of this Certificate and the Certificate holder's instructions, systems incorporating the panels will withstand, without damage or permanent deformation, the stresses imposed by self-weight and wind loads likely to be experienced in the UK. For design purposes:

- panel deflection should be limited to 1/240 of the distance between fixings
- panels have a flexural strength of >5 MPa in accordance with BS EN 12372 : 2006

- based on testing with a safety factor of 3, the design pull-out strength of the attachment plate from the panel may be taken as:
  - — SP-1-6-3 model 2.65 kN
  - — SP-1-10-3 model 2.37 kN.

6.3 The maximum distance between fixings should be either 600 mm horizontally by 800 mm vertically, or 800 mm horizontally by 600 mm vertically.

6.4 The wind loads on the wall should be calculated in accordance with BS EN 1991-1-4 and its UK National Annex. Special consideration should be given to locations with high wind-load pressure coefficients as additional fixings may be necessary. In accordance with BS EN 1990, it is recommended that a load factor of 1.5 is used to determine the ultimate wind load to be resisted by the system.

6.5 The supporting wall must be able to take the full wind as well as any racking loads. The cladding system does not contribute in this respect and should be disregarded.

Impact loading

6.6 When installed in accordance with this Certificate, the panels have good impact resistance, and can be used in areas readily accessible to the public and others with little incentive to exercise care.

7 Behaviour in relation to fire

7.1 The reaction to fire classification for the external surface of the panel is Class 0 or 'low risk' as defined in the national Building Regulations.

7.2 There is no restriction on height or boundary for the panels when included in the following wall specification, which, when tested, met the performance criteria in Annex B of BRE Report BR 135 : 2013 *Fire performance of external thermal insulation for walls of multistorey buildings* (the components of the wall construction are outside the scope of this Certificate):

- a system comprising a 140 mm lightweight SFS steel framing system or masonry/concrete substrate fitted with stone wool insulation and overlaid by a 12 mm cement particle sheathing board covered with a vapour membrane, and StoneLite Cladding Panels secured to the substrate wall by means of an aluminium interlocking channel system which created a 34 mm cavity.

7.3 For houses in Scotland, and for all buildings in England and Wales and Northern Ireland, the panels are suitable for use on, or at any distance from, the boundary.

7.4 For flats and maisonettes and non-domestic buildings in Scotland, the panels are suitable only for use more than one metre from the boundary, with the exception of the system detailed in section 7.2 of this Certificate.

7.5 The panels are not classified as 'non-combustible', and therefore calculations for unprotected areas may apply, depending on the fire resistance characteristics of the wall, with the exception of the system detailed in section 7.2 of this Certificate where no boundary restrictions apply.

7.6 When used in conjunction with combustible materials, the whole wall construction, including the panels, must meet the requirements of BRE Report BR 135 : 2013.

7.7 To limit the risk of fire spread between floors in buildings subject to national Building Regulations, fire barriers must be incorporated in the cavity behind the panels as required under these Regulations, but should not block essential ventilation pathways. Guidance on fire barriers can be found in BRE Report BR 135 : 2013.

8 Weathertightness

8.1 The panels can be incorporated into a ventilated and drained cladding system.

8.2 The inner wall or structure supporting the cladding must be watertight.

8.3 The minimum air gap formed between the back face of the panels and the substrate wall, or insulation, should be 20 mm.

8.4 To minimise water penetration and risk of damage to the inner wall, the recommendations of BS EN 1991-1-4 : 2005 should be followed.

8.5 The stone veneer has a water absorption of <25% in accordance with BS EN 13755 : 2005.

9 Maintenance and repair

9.1 For normal soiling, the surface may be cleaned using hot water, applied with a suitable non-abrasive cleaning pad or sponge. For more difficult chemical soiling, the Certificate holder's specialist advice should be sought.

9.2 Damaged panels should be replaced as soon as is practicable, following the Certificate holder's instructions and observing all necessary health and safety precautions.

9.3 Annual maintenance inspections should be carried out to ensure that rainwater goods are complete and in good order and that flashings and seals are in place and secure. Damaged seals should be replaced and new sealant applied where necessary.

10 Durability

10.1 The durability and service life of the panel will depend upon the stone veneer chosen, and the building location and height, façade aspect, intended use of the building and immediate environmental conditions to which it is exposed.

10.2 Provided that regular maintenance is carried out as described in section 9 and in accordance with the Certificate holder's instructions, the product should have a service life of over 60 years.

10.3 In general, any colour change will be slight and uniform on any one elevation. The degree of any change will depend on the stone type and finish.

11 Reuse and recyclability

Approximately 20% by weight of StoneLite Cladding Panels is recyclable. When necessary, and if not damaged, panels can be removed and reused.

Installation

12 General

12.1 StoneLite Cladding Panels must be installed in accordance with the Certificate holder's recommendations, the requirements of this Certificate and the specification laid down by the consulting engineer.

12.2 Site tests should be conducted to ensure compatibility between the sealant used and the panels (see section 4.11).

12.3 At the design stage and at the commencement of the installation, technical advice should be sought from the Certificate holder.

12.4 The mounting brackets and rails, the support frame and its fixing to the substrate wall, and the sealants used with the panels are outside the scope of this Certificate. The sealant manufacturer will be required to conduct compatibility tests to ensure that the correct sealant is used. Details should be sought from the Certificate holder.

13 Procedure

13.1 Based on the design and method of panel attachment, the structure is prepared and the appropriate type of support system installed accordingly (see section 4). The alignment of the supports should be checked regularly during installation. Differences in alignment of more than 1 mm per metre should be compensated for by packing out the appropriate member until an acceptable tolerance is attained.

13.2 The cladding panels should be mounted to the supports working from the bottom upwards and using the appropriate fasteners, where applicable (see section 6).

13.3 When installing directly onto a masonry substrate, the surface must be sufficiently flat. Variations greater than 10 mm per 2 m should be made good before installation progresses (see section 13.1).

13.4 The panels should be sealed as described in section 4 as installation progresses. Joint gaps may vary to provide adequate allowance for expansion (see sections 4.9 to 4.11).

Technical Investigations

14 Investigation

14.1 An assessment was made of the fire resistance of a wall section clad with the panels, based on tests carried out in accordance with BS 8414-2 : 2005.

14.2 An assessment was made of the performance of installed panels.

14.3 The Certificate holder's technical literature and drawings were examined for any inconsistencies and general content.

14.4 An assessment was made of the durability of the product with particular reference to the Certificate holder's stated design life of 60 years, including a survey of users of the product with installations more than 25 years old.

14.5 An assessment was made of the product's strength and stability.

14.6 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.

Bibliography

BS 8414-2 : 2005 *Fire performance of external cladding systems — Test method for non-loadbearing external cladding systems fixed to and supported by a structural steel frame*

BS EN 485-2 : 2013 *Aluminium and aluminium alloys — Sheet, strip and plate — Mechanical properties*

BS EN 1990 : 2002 *Eurocode : Basis of structural design*

BS EN 1991-1-4 : 2005 Eurocode 1 : Actions on structures — General actions — Wind actions
NA to BS EN 1991-1-4 : 2005 UK National Annex to *Eurocode 1 : Actions on structures — General actions — Wind actions*

BS EN 12372 : 2006 *Natural stone test methods— Determination of flexural strength under concentrated load*

BS EN 13755 : 2008 *Natural stone test methods — Determination of water absorption at atmospheric pressure*

Conditions of Certification

15 Conditions

15.1 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.

15.2 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.

15.3 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.

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

15.5 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.

15.6 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.

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