Steni UK Limited
Units 1–4
Vauxhall Industrial Estate
Ruabon
Wrexham LL14 6HA
Tel: 01978 812111 Fax: 01978 810399
e-mail: info@steni.co.uk
website: www.steni.co.uk

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
09/4662
Product Sheet 1

STENI CLADDING PANELS

STENI COLOUR AND STENI NATURE/IMAGO RAINSCREEN CLADDING PANELS

This Agrément Certificate Product Sheet(1) relates to Steni Colour and Steni Nature/Imago Rainscreen Cladding Panels, glass-fibre reinforced polymer composite boards with a surface aggregate finish or a smooth acrylic finish. The panels are fixed to a suitable timber or metal sub-frame to provide a protective/decorative cladding over the external walls of new or existing buildings.

(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 panels can be incorporated in a rainscreen cladding system suitably designed to resist the wind loads normally experienced in the UK (see section 6).

Behaviour in relation to fire — the panels when tested for reaction to fire, achieved a classification of B-s1 d0 therefore, can be incorporated in a construction meeting regulatory requirements (see section 7).

Air and water penetration — providing the joints between panels are adequately baffled, the cladding system incorporating the product will adequately protect the substrate wall (see section 8).

Durability — provided that regular maintenance is carried out in accordance with this Certificate and the Certificate holder's instructions, the system should have an ultimate service life of over 25 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: 4 June 2014

Brian Chamberlain
Head of Approvals — Engineering

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

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.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA
tel: 01923 665300
fax: 01923 665301
e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk

Regulations

In the opinion of the BBA, Steni Colour and Steni Nature/Imago Rainscreen Cladding Panels, 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:		The product is acceptable for use as set out in sections 6.1 to 6.8 of this Certificate.
Requirement:	B4(1)	External fire spread
Comment:		The product is judged to meet the Class 0 requirements. See sections 7.1 to 7.7 of this Certificate.
Requirement:	C2(b)(c)	Resistance to moisture
Comment:		The product used within a cladding system is not watertight but will resist the passage of rainwater to the supporting structure. See sections 8.1 to 8.3 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 product can contribute to a construction satisfying this Regulation. See sections 9.1 to 9.3, 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 6.1 to 6.8 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Standard:	2.7	Spread on external walls
Comment:		The product, when used in conjunction with fire-resistance materials can contribute to satisfying this Standard, with reference to clauses 2.6.4[(1)(2)] and 2.7.1[(1)(2)] respectively. See sections 7.1 to 7.7 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The product will contribute to meeting this Standard, with reference to clauses 3.10.1[(1)(2)] to 3.10.3[(1)(2)]. See sections 8.1 to 8.3 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.

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012

Regulation:	23	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 moisture and weather
Comment:		The product will contribute to meeting this Regulation. See sections 8.1 to 8.3 of this Certificate.
Regulation:	30	Stability
Comment:		The product is acceptable as set out in sections 6.1 to 6.8 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The product is judged to meet the Class 0 requirements. See sections 7.1 to 7.7 of this Certificate.

Construction (Design and Management) Regulations 2007

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

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

See sections: 3 *Delivery and site handling* (3.4) and 11 *Installation – General* (11.4), 9 *Maintenance and repair* (9.3) of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of Steni Colour and Steni Nature/Imago Rainscreen Cladding Panels, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.9 – D8 *Rainscreen cladding*.

Technical Specification

1 Description

1.1 The Steni Colour and Steni Nature/Imago Rainscreen Cladding Panels are composite panels manufactured from a glass-fibre reinforced polymer composite board with a smooth acrylic finish (Steni Colour) or a natural aggregate finish (Steni Nature/Imago). Characteristics and dimensions of the panel are given in Table 1.

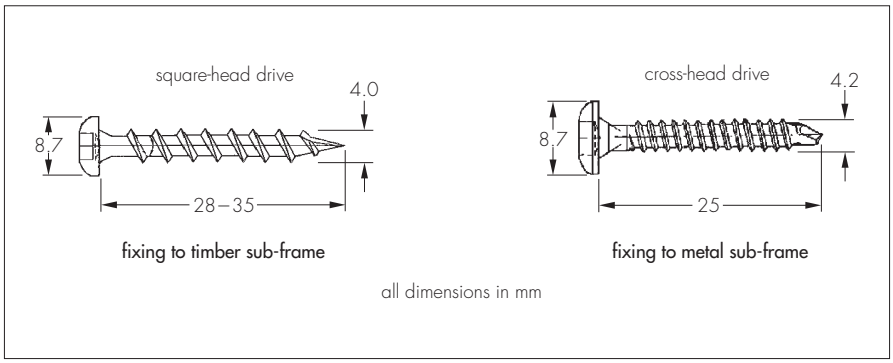
Table 1 Panel dimensions and characteristics

Characteristic	Panel type						
	Steni colour	Steni Nature/Imago					
		Type FM (Fine Micro)	Type F (Fine)	Type M (Medium)	Type C (Coarse)	Type T (Tumbled)	Imago
Width (mm)				1195			
Length (mm)	850-3500	850-3500	900-3500	900-3500	900-3500	900-3500	850-3500
Approximate overall thickness (mm)	6.0	6.0	6.5	8.0	14.0	18.0	6.0
Approximate thickness (excluding aggregate) (mm)	–	5.0	5.5	5.5	6.0	6.0	5.0
Finish	Electron cured acrylic	Crushed natural aggregate					Ceramic-coloured natural aggregate
Gloss levels	Matt, Half Matt and High Gloss	–	–	–	–	–	–
Aggregate size (mm)	–	1-3	1-3	3-5	5-8	8-12	1-2.5
Colours[1]	60	24	24	24	24	24	11
Weight (kg m^{-2})	12	11.5	12.0	15.0	18.0	25.5	11.5
Density (kg m^{-3})				2000			

(1) Other colours to special order.

1.2 The panels are attached to the sub-frame by the use of stainless steel screws of grade A4 to BS EN ISO 3506-1 : 2009 (see Figure 1).

Figure 1 Details of fixing screws



1.3 All other components used in the build-up of a cladding system using the panels are outside the scope of this Certificate. These include:

Supporting framework profiles, sub-frame, fixing brackets and associated fixings

insulation — rigid type (eg boards or batts)

cavity barriers

vapour permeable membrane.

2 Manufacture

2.1 Steni Colour and Steni Nature/Imago panels are manufactured by a continuous process whereby a substrate of glass fibre and granulated aggregate chipping is built up, resin impregnated and consolidated.

2.2 The smooth surface Steni colour panel is achieved using an electron beam cured acrylic colour surface using 100% acrylic.

2.3 During the process of making Steni Nature/Imago Panels, aggregate chippings are embedded into the fluid surface of the panel, and then oven-cured adhered.

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

- 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.

2.5 The management system of Steni AS has been assessed and registered as meeting the requirements of ISO 9001 : 2008 by Bureau Veritas (Certificate 00022).

2.6 The management system of Steni UK Limited has been assessed and registered as meeting the requirements of ISO 14001 : 2004 by ISOQAR (Certificate 1861).

3 Delivery and site handling

3.1 The panels are delivered to site shrink-wrapped onto strapped pallets. The pallets bear product details including details such as type, size, quantity, identification code, manufacturing references and colour.

3.2 The pallets should be stored off the ground on a firm dry, flat and level surface suitably protected from the weather.

3.3 The pallets must always be transported and the individual panels handled with care to avoid damage. They should be lifted and carried vertically, rather than slid across, each other.

3.4 Suitable protective equipment must be worn when working with the panels (i.e. gloves, protective footwear).

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Steni Colour and Steni Nature/Imago Rainscreen Cladding Panels.

Design Considerations

4 General

4.1 Steni Colour and Steni Nature/Imago Rainscreen Cladding Panels is suitable for use on timber and metal framework of new and existing buildings to provide an opened-jointed, back-ventilated protective cladding.

4.2 All design aspects of the installation should be checked by a suitably qualified and experienced individual in accordance with the requirements of the relevant national Building Regulations and Standards.

4.3 The cavity behind the cladding should be a minimum width of 50 mm, with a minimum ventilation area of 1000 mm^2 per metre run of cladding (see section 8). The ventilation openings should be suitably protected, or baffled, to prevent the ingress of birds, vermin and rain.

4.4 The wall and the sub-frame to which the cladding is fixed should be structurally sound and constructed in accordance with the requirements of the relevant national Building Regulations and Standards.

4.5 The substrate to which the cladding is fixed should be fire rated. No contribution from the cladding system should be assumed in this regard.

4.6 The wall to which the cladding is fixed should be watertight and resistant to the transmission of sound.

4.7 As the rainscreen is open-jointed, any insulation behind the cladding should be suitably fixed to the supporting wall, and protected, to resist the forces of wind suction. Insulation should be of a rigid type (eg boards or batts) and where its performance could be diminished by moisture, a breather membrane should be provided over its outer face. 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 To allow for expansion, the panels should be fixed to the sub-frame using the specified screw through close tolerance holes at the middle and oversized holes of appropriate diameter at the edges of the panel.

4.9 A gap of 10 mm should be provided between adjacent panels. The panels should not straddle any gaps provided for expansion between sub-frame members.

4.10 The air space between the back of the panels and the supporting wall or insulation (where specified) must be a minimum 50 mm as given in NHBC Standards 2014, Chapter 6.9, while allowing for conventional building tolerances.

5 Practicability of installation

The product is designed to be installed by a competent builder experienced with ventilated rainscreen cladding systems.

6 Strength and stability

Wind loading

6.1 Wind loads should be calculated in accordance with BS EN 1991-1-4 : 2005 + A1 : 2010 and the UK National Annex. Due consideration should be given to higher pressure coefficients applicable to corners of the building, as recommended in this Standard.

6.2 The design of the sub-frame and its attachment to the substrate wall should be in accordance with the relevant Codes and Standards, and should be such as to limit mid-span deflections to span/200 and cantilever deflections to span/150.

6.3 Details of the fasteners(1) for fixing the panel to the sub-frame are shown in Figure 1. The fixing-to-panel-edge distance should not be less than 15 mm.

(1) For details of the fixing suppliers, the Certificate holder should be consulted.

6.4 Tests were carried out to confirm the ultimate resistance to wind actions of Steni Colour Panels. The design wind pressures (positive or negative) for two nominal support spacings and three fixing centres are presented in Tables 2 and 3. These results are also valid for Steni Nature/Imago.

Table 2 Design wind pressures (Pa) — Installation to timber sub-frame

Panel(1) orientation	600 mm support spacing fixing centres (mm)			400 mm support spacing fixing centres (mm)		
	300	250	200	300	250	200
Vertical	1400	1700	2100	2300	2800	3500
Horizontal	1550	1850	2350	2850	3100	3550

(1) Nominal size 1200 mm x 2400 mm.

Table 3 Allowable wind pressures (Pa) — Installation to metal sub-frame

Fixing layout(1) V x H	600 mm support spacing fixing centres (mm)			400 mm support spacing fixing centres (mm)		
	300	250	200	300	250	200
2 x 2	930	1090	1340	1390	1640	2010
3 x 2 n x 2	1030	1220	1360	1540	1830	2260
2 x 3 2 x n	990	1170	1430	1480	1750	2140
3 x 3 n x n	1140	1370	1435	1640	1960	2420

(1) V = vertical, H = horizontal, n = number of fixings ≥3.

6.6 For design purposes, the following panel mechanical properties may be assumed:

allowable flexural stress ($N \cdot mm^{-2}$)	10
flexural modulus ($N \cdot mm^{-2}$)	5000
allowable fixing pull-through value (N):	
– middle	320
– edge	100
– corner	45.

6.7 As the cladding is open-jointed, the supporting wall must be able to resist the full wind as well as any racking loads on its own. No contribution from the cladding may be assumed in this regard.

6.8 The design of the installation should be checked by a suitably qualified engineer.

Impact

6.9 A sample of the panel supported on battens at 600 mm centres when tested for hard and soft body impacts, achieved adequate resistance for use in Categories II, III and IV as defined in ETAG 034, Part I (an extract of which is reproduced in Table 4).

Table 4 Definition of Use Categories (reproduced from ETAG 034, Part I, 6.4.4. Table 4)

Use category	Description
I	A zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use.
II	A zone liable to impacts from thrown or kicked objects, but in public locations where the height of the kit will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care.
III	A zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.
IV	A zone out of reach from ground level

Note: Category I shown for information only and not suitable for this product.

6.10 The level of safety may be increased by reducing the support studs to 400 mm centres and using thicker variants of Steni Nature (Medium, Course and Tumbled).

7 Behaviour in relation to fire

7.1 Samples of the panel, when tested for reaction to fire, achieved a classification of B-s1 d0 for Steni Colour, Steni Nature M/C/F/FM and Steni Imago, in accordance with the BS EN 13501-1 : 2007 + A1: 2009.

7.2 The panels may be regarded as having a Class 0 surface or 'low risk' material in accordance with the national Building Regulations. The unexposed side of the panel may also be regarded as having a Class 0 surface.

7.3 For houses[*] in Scotland and for all buildings in England and Wales and Northern Ireland, the system is suitable for use on, or at any distance from, the boundary.

7.4 For flats and maisonettes and non-domestic buildings in Scotland, the system is suitable only for use more than 1 m from the boundary.

7.5 For resistance to fire, the performance of a wall incorporating the rainscreen can only be determined by tests from a suitably accredited laboratory and is not covered by this Certificate.

7.6 The incorporation of combustible material behind the cladding should be avoided wherever possible; any insulation should be non-combustible.

7.7 Cavity barriers should be incorporated behind the cladding, as required under the national Building Regulations, for example, by use of intumescent cavity barriers or overhanging non-combustible breaks at each floor level. These should not block essential ventilation and drainage pathways.

8 Air and water penetration

8.1 The product is suitable for use in back-ventilated and drained rainscreen cladding systems.

8.2 The cladding is not airtight or watertight, but intentionally open-jointed, back ventilated and drained. However, the amount of water entering the cavity by wind driven rain will be minimal. Any water collecting in the cavity due to rain or condensation will be removed by drainage and ventilation.

8.3 The supporting wall must be watertight and reasonably airtight.

9 Maintenance and repair

9.1 For normal soiling, the surface may be cleaned using hot water/household detergent, applied with a suitable cleaning pad or sponge. Abrasive cleaners should not be used. For more difficult chemical soiling, the Certificate holder's specialist advice should be sought.

9.2 Annual maintenance inspections should be carried out to ensure that rainware is complete and in good order and that features such as tiles, flashings and seals are in place and secure.

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

10 Durability

10.1 The durability and service life of the cladding panels will depend upon the building location and height, intended use of the building and the immediate environmental conditions to which it is exposed. Providing regular maintenance is carried out as described in section 9 and in accordance with the Certificate holder's instructions, the system should have an ultimate service life of over 25 years.

10.2 In general, there will be a colour change and dulling of the surface. However, this is not likely to be excessive or progressive and will be uniform on any one elevation.

Installation

11 General

11.1 Steni Colour and Steni Nature/Imago Rainscreen Cladding Panels must be installed in accordance with the Certificate holder's recommendations, the requirements of this Certificate and specifications laid down by the consulting engineer.

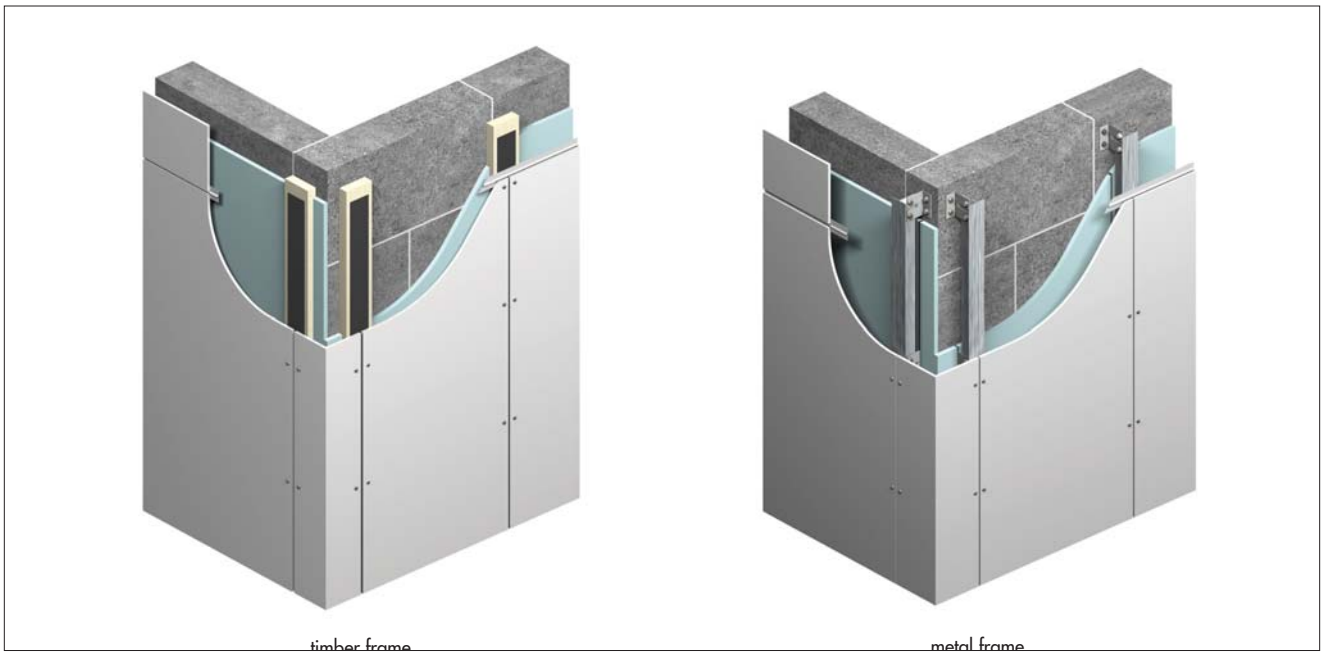
11.2 Installers must be experienced with ventilated rainscreen cladding systems. Additionally, the Certificate holder can provide technical assistance at the design stage and at the start of the installation.

11.3 If significant colour variations between batches are likely, it may be necessary to mix the boards from different pallets so as to obtain a uniform shade over the façade. Where colour match is crucial, panels for complete facades or areas should be ordered in one batch to avoid risk of placing different batches next to each other.

11.4 The panels can be cut on site using suitable cutting equipment ensuring operatives follow the relevant safety precautions (i.e. wearing face mask, goggles).

11.5 Typical installation details are given in Figure 2.

Figure 2 Steni panel installation



12 Procedure

12.1 Based upon the architectural and design details, a grid layout is first prepared and the cladding support system installed. Accurate grid positioning and installation of the support system is essential. A minimum cavity gap of 50 mm behind the panels must be provided to allow adequate ventilation and avoid external water penetration onto the supporting substrate or insulation.

12.2 Depending on the cladding system and degree of exposure, a vapour permeable membrane may be required to protect the substrate wall or insulation.

12.3 Working from the bottom upwards, the panels are fixed to the vertical supports using the specified screws at the centres determined by design ensuring a 10 mm open joint vertically and horizontally (see section 6). The panels are secured with holes in the panels 1 mm larger than the diameter of the screw shank.

12.4 Closure profiles, trims and EPDM rubber gaskets are used to complete the cladding system in accordance with the Certificate holder's installation guide.

Technical Investigations

13 Investigations

13.1 From test data, an assessment was made of the product's wind loading resistance, impact resistance, durability and behaviour in relation to fire.

13.2 Based on a user survey, an assessment was made of the product's practicability of installation and its performance in use.

13.3 The Certificate holder's technical literature was examined for inconsistencies and general content.

Bibliography

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 : Actions on structures — General actions — Wind actions*

BS EN 13501-1 : 2007 + A1 : 2009 *Fire classification of construction products and building elements. Classification using test data from reaction to fire tests*

BS EN ISO 3506-1 : 2009 *Mechanical properties of corrosion-resistant stainless steel fasteners — Bolts, screws and studs*

ETAG 034, part I : 2012 *Guideline For European Technical Approval Of Kits For External Wall Claddings*

ISO 9001 : 2008 *Quality Management*

ISO 14001 : 2004 *Environmental Management*

Conditions of Certification

14 Conditions

14.1 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.

14.2 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.

14.3 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.

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

14.5 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.

14.6 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.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

tel: 01923 665300
fax: 01923 665301
e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk