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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

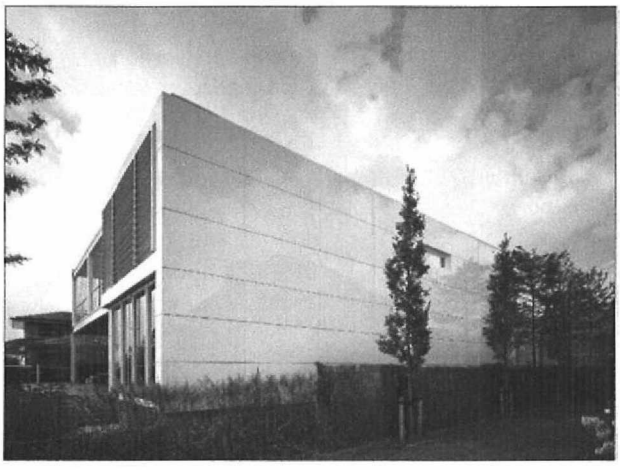
Agrément Certificate
08/4510
Product Sheet 1

ARCONIC CLADDING PANELS

REYNOBOND ARCHITECTURE WALL CLADDING PANELS

This Agrément Certificate Product Sheet[1] relates to Reynobond Architecture Wall Cladding Panels, aluminium composite panels mechanically fastened to vertical aluminium rails, to provide an open-jointed, back-ventilated and drained rainscreen cladding system for use over the external walls of new and 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, when incorporated in a suitably designed cladding system, can resist the wind and impact actions normally encountered in the UK (see section 6).

Behaviour in relation to fire — the panels have a B-s1, d0 reaction to fire classification to BS EN 13501-1 : 2007 and are restricted for use on buildings up to 18 metres in height, unless specific conditions are met (see section 7).

Air and water penetration — the vertical and horizontal joints between the panels will minimise water entering the cavity. Any water collecting in the cavity will be removed by drainage and ventilation (see section 8).

Durability — under normal conditions, the products will perform effectively as an external cladding with an ultimate life of at least 30 years. The polyester and the PVDF coatings will retain a good appearance for at least 15 and 20 years respectively in non-corrosive environments and at least 10 and 15 years respectively in severe industrial environments (see section 10).

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

On behalf of the British Board of Agrément

Date of Second issue: 4 August 2017

Originally certificated on 14 January 2008

Certificate amended on 22 September 2017 to remove ST panel.

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
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, Reynobond Architecture Wall 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 products are acceptable for use as set out in sections 4.3 and 6 of this Certificate.
Requirement:	**B3(4)**	**Internal fire spread (structure)**
Comment:		The use of the products is restricted by this Requirement.
Requirement:	**B4(1)**	**External fire spread**
Comment:		The products can contribute to satisfying this Requirement. See sections 7.1 to 7.4 and 7.6 to 7.8 of this Certificate.
Requirement:	**C2(b)(c)**	**Resistance to moisture**
Comment:		The products will satisfy this Requirement. See section 8 of this Certificate.
Regulation:	**7**	**Materials and workmanship**
Comment:		The products are 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)**	**Durability, workmanship and fitness of materials**
Comment:		The products can contribute to a construction satisfying this Regulation. See sections 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 products are acceptable, with reference to clauses 1.1.1[(1)(2)], 1.1.2[(1)(2)] and 1.1.3[(1)(2)]. See sections 4.3 and 6 of this Certificate.
Standard:	2.4	Cavities
Comment:		The products can satisfy this Standard, with reference to clauses 2.4.1[(1)(2)], 2.4.2[(1)(2)], 2.4.5[(1)(2)] and 2.4.9[(1)(2)]. See section 7.8 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The products can contribute to satisfying this Standard, with reference to clauses 2.6.4[(1)(2)], 2.6.5[(1)] and 2.6.6[(2)]. See section 7 of this Certificate.
Standard:	2.7	Spread on external walls
Comment:		The products 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:		The products will contribute to satisfying this Standard, with reference to clauses 3.10.1[(1)(2)] to 3.10.3[(1)(2)], 3.10.5[(1)(2)] and 3.10.6[(1)(2)]. See section 8 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The products 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:		Comments in relation to the products 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	Fitness of materials and workmanship
Comment:		The products are acceptable. See sections 10.1 and 10.2 and the *Installation* part of this Certificate.
Regulation:	28	Resistance to moisture and weather
Comment:		The products will contribute to a roof satisfying this Regulation. See section 8 of this Certificate.
Regulation:	30	Stability
Comment:		The products are acceptable as set out in sections 4.3 and 6 of this Certificate.
Regulation:	36	External fire spread
Comment:		The products can contribute to satisfying this Regulation. See sections 7.1 to 7.6 and 7.6 to 7.8 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

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

See sections: 1 *Description* (1.2), 3 *Delivery and site handling* (3.4) and 9 *Maintenance* (9.3) of this Certificate.

Additional Information

NHBC Standards 2017

In the opinion of the BBA, Reynobond Architecture Wall Cladding Panels, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 6.9 *Curtain walling and cladding*.

Technical Specification

1 Description

1.1 Reynobond Architecture Wall Cladding Panels are flat aluminium composite panels comprising two 0.5 mm thick aluminium alloy sheets (EN AW-3005, H46 to BS EN 573-3 : 2013) bonded to either side of a low-density polyethylene (LDPE) core. The exposed face is coated with either a 28 µm layer of polyvinylidene difluoride paint (PVDF 70/30) or a 35 µm layer of polyester paint (Duragloss 5000), a polyester primer protects the unexposed face.

1.2 The panels are available in the FR Grade with the nominal characteristics given in Table 1.

Table 1 Panels dimensions and characteristics[1]

Characteristic (unit)	Value
Width (mm)	1000, 1250, 1500, 1750, 2000
Length (mm)	2000 – 6050
Thickness (mm)	3, 4, 6
Panel weight (Nm^{-2})	45.9, 55.1, 73.6
Finishes	15 standard colours and gloss levels

(1) Non-standard panel sizes and finishes are available to order.

1.3 The panels are mechanically fastened to the aluminium sub-frame[1] using aluminium rivets forming an open-jointed cladding system. Details of panel mountings are shown in Figure 1.

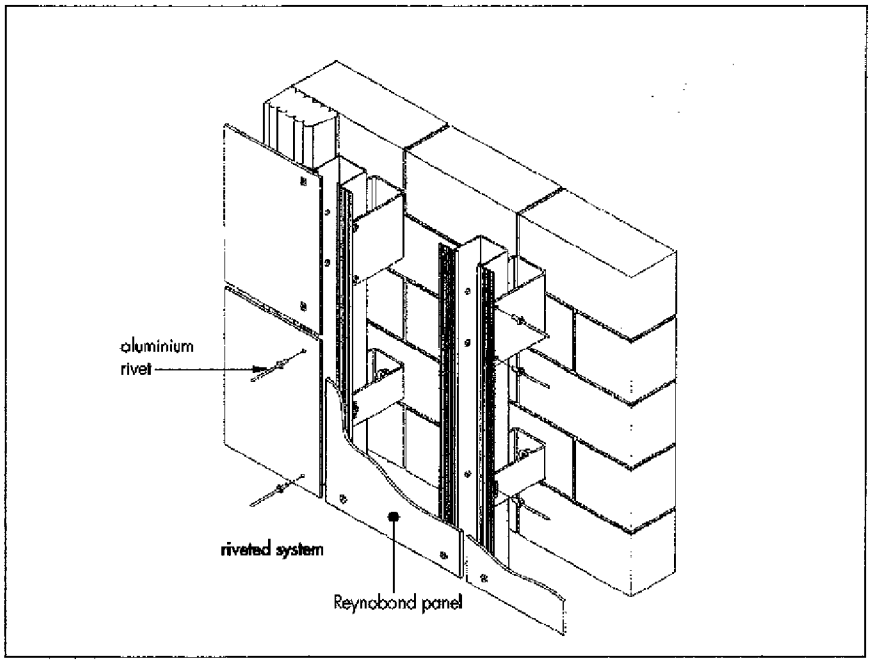
1.4 The flat panels can be formed into cassettes[1] with different flange widths and fixed to the aluminium subframe[1] by means of T-slots fitting onto pins.

(1) The manufacturing and the use of the cassettes, the sub-frame and its attachment to the substrate wall are not covered by this Certificate.

1.5 Items used with the system, but outside the scope of this Certificate, include:

- aluminium sub-frame
- wall brackets
- substrate anchors —used to fix the bracket to the substrate wall (specification dependent on the strength of the substrate)
- substrate wall
- insulation — rigid or semi-rigid non-combustible insulation boards
- breather membrane
- cavity barriers.

Figure 1 Typical fixing system for Reynobond Architecture Wall cladding



2 Manufacture

2.1 The panels are manufactured by bonding the two coil-coated aluminium sheets to both sides of the extruded polyethylene core in a continuous lamination process. Part of the waste from the manufacturing process is recycled into production.

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 being operated by the manufacturer are being maintained.

2.3 The management systems of Arconic Architectural Products s.a.s. have been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by BUREAU VERITAS (Certificate US009823-1).

3 Delivery and site handling

3.1 The panels, separated by blocks, are delivered to site in closed crates. The crates bear product details such as type, size, quantity, identification code, manufacturing references and colour.

3.2 To allow the panels to acclimatise, the crates should be stored on a dry, flat and level surface, suitably protected from the weather, for at least 24 hours before installation. The protective film on the panels should be removed as soon after installation as possible.

3.3 The panels should be handled with care to avoid damage. They should be lifted off, rather than slid across, each other. For temporary support during installation, polystyrene or foam wedges may be used.

3.4 Care should be exercised when handling the panels to avoid injury from sharp edges. Protective clothing should be worn and all Health and Safety rules observed.

Assessment and Technical Investigations

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

Design Considerations

4 General

4.1 Reynobond Architecture Wall Cladding Panels are satisfactory for use in an open-jointed, back-ventilated and drained cladding system on the external walls of new and existing buildings of up to 18 metres in height (see Section 7).

4.2 It is important for designers, planners, contractors and/or installers to ensure that the installation of the panels is in accordance with the Certificate holder's instructions and the information given in this Certificate. All design aspects should be checked by a suitably qualified and experienced individual in accordance with the requirements of the relevant national Building Regulations and Standards. For advice on specific construction details, eg flue pipe penetrations, the Certificate holder should be consulted.

4.3 The substrate wall and the sub-frame to which the panels are fixed should be structurally sound. The substrate wall must satisfy the requirements of the relevant national Building Regulations and Standards with regard to watertightness, heat and sound transmission.

4.4 Ventilation and drainage must be provided behind the panels. As the panels are open-jointed, the clear cavity between the back of the panel and the substrate wall (or insulation if installed on the substrate wall) must be at least 50 mm wide to ensure that a minimum ventilation area of 5000 mm^2 per metre run of cladding is achieved. Joint gaps between the panels are between 10 and 20 mm wide. All ventilation openings around the periphery of a cladding system incorporating the Reynobond Architecture Wall Cladding Panels should be suitably protected with mesh to prevent the ingress of birds, vermin and insects.

4.5 To allow for thermal expansion, a minimum gap of 2 mm per metre length between adjacent support rails should be provided. The panels must not straddle this gap.

4.6 As the panels are open-jointed, any insulation installed behind the cladding must be suitably fixed to the supporting wall and protected to resist the forces of wind suction. Insulation should be of a rigid or semi-rigid type (eg boards) and, where its performance could be diminished by moisture, a breather membrane should be provided over its outer face.

5 Practicability of installation

The products are suitable for installation by cladding contractors provided they have undergone suitable training. The Certificate holder can provide advice on installation if required.

6 Strength and stability

Wind loading

6.1 Design wind actions should be calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. Due consideration should be given to the higher pressure coefficients applicable to corners of the building as recommended in this Standard.

6.2 The supporting substrate wall must have sufficient strength to resist on its own the loads imparted directly by the cladding system and wind actions normally experienced in the UK, as well as any racking loads. No contribution from the cladding system may be assumed in this respect.

6.3 The designer should ensure that:

- the design of the sub-frame is in accordance with the relevant codes and Standards, such as to limit mid-span deflections to span/200 and cantilever deflections to span/150
- the panels are fixed to the sub-frame using the specified fixing mechanisms (see section 1.3)
- fixing of the support brackets to the supporting wall has adequate tensile pull-out strength and corrosion resistance (not covered by this Certificate). An appropriate number of site-specific pull-out tests must be conducted on the substrate wall to determine the minimum pull-out resistance to failure of the fixings. The characteristic pull-out resistance should be determined in accordance with the guidance given in EOTA TR055, using 50% of the mean value of the five smallest measured values at the ultimate load.

6.4 For design purposes, the panel properties given in Table 2 may be adopted.

Table 2 Panel properties(1)

Panel thickness (mm)	Permissible stress ($N \cdot mm^{-2}$)	Section modulus Z ($cm^3 \cdot m^{-1}$)	Flexural rigidity EI (Nm^2m^{-1})
3	92	1.25	125
4	92	1.75	240
6	92	2.75	590

(1) The maximum panel centre deflection will be governed by specific project requirements but should not exceed 1/30 of the diagonal formed by four adjacent fixings or 50 mm, whichever is the lesser.

6.5 Aluminium rivets should be used to attach the panels to the support frame (see section 1.3 and Figure 1). The design should ensure adequate capacity against wind pressure/suction. To allow for panel expansion, fixings in clearance holes should be provided as required.

6.6 The maximum allowable wind pressure/suction will be the lesser value obtained by considering the panels flexural strength and the resistance of the fixings separately.

Impact

6.7 Hard body and soft body impact resistance is a function of the panel and its subframe/support and must be evaluated through testing in accordance with ETAG 034 : 2012 by an accredited body and appropriate impact use categories determined in accordance with the same standard. The classification determined from the tests will depend on the distance between the centres of support and will establish the areas where the completed cladding system can be used (see Table 4 of ETAG 034 : 2012, Part 1).

7 Behaviour in relation to fire

7.1 Classifications for some colours of the Reynobond Architecture Wall Cladding Panels in accordance with BS EN 13501-1 : 2007 or as defined in the national Building Regulations are shown in Table 3. These performances may not be achieved by all colours of the panels, and the classification of a particular colour should be confirmed by assessment or testing by a UKAS-accredited laboratory.

Table 3 Fire classifications of panels

Panels	Fire classification	Standard or national Building Regulation
FR with gold Duragloss 5000 coating	B-s1, d0	—
FR with metallic grey PVDF coating	—	Class 0[1] or 'low risk'[2]

(1) As defined in Appendix A, paragraph 13(a) to the Approved Document B to The Building Regulations 2010 (England and Wales) (as amended) and section 3.4 of the Technical Booklet E to The Building Regulations (Northern Ireland) 2012 (as amended).
(2) As defined in section 2.E.3, table 2.20 of the Technical Handbook (Non-domestic) and in table 2.8, section 2.B.3 of the Technical Handbook (Domestic) to The Building (Scotland) Regulations 2004 (as amended).

7.2 The reverse side specification of the panels also has a Class 0 or 'low risk' classification.

7.3 The products are not classified as being 'non–combustible' or of 'limited combustibility' ('non-combustible' in Scotland) and so their use is restricted to 18 metres in height unless a full scale fire test to either BS 8414-1 : 2015 or BS 8414-2 : 2015 has been conducted for the specific wall construction under consideration, and the other requirements of BRE Report BR 135 : 2013 have been met.

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

7.5 For flats and maisonettes and non-domestic buildings in Scotland, the products are suitable only for use more than one metre from the boundary.

7.6 The products are not classified as 'non-combustible'. Calculations for unprotected areas may therefore apply, dependent on the fire resistance characteristics of the wall.

7.7 For resistance to fire, the performance of a wall incorporating the products can only be determined by tests from a suitably-accredited laboratory for the specific complete wall construction under consideration, and is not covered by this Certificate.

7.8 To limit the risk of fire spread between floors in buildings subject to the 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 Air and water penetration

8.1 The products are suitable for use in back-ventilated and drained cladding systems.

8.2 The supporting wall must be watertight and reasonably airtight.

8.3 Providing all joints are adequately baffled, the amount of water entering the cavity by wind-driven rain will be minimal. Water collecting in the cavity owing to rain or condensation will be removed by drainage and ventilation.

8.4 The air space between the back of the panels and the supporting wall or insulation should be as wide as possible and allow for conventional building tolerances.

9 Maintenance

9.1 The painted surface may be cleaned using hot and cold water with a mild cleaning agent using a non-abrasive pad or sponge. General household cleaners should not be used. After cleaning, the surface should be rinsed with clean water. For more difficult chemical soiling, the Certificate holder's specialist advice must be sought.

9.2 Annual maintenance inspections should be carried out to ensure that gutters and downpipes are clear and in a good state, and that such features as flashings and seals are in place and secure.

9.3 Damaged panels should be replaced as soon as practicable; work carried out should follow the Certificate holder's instructions and all necessary health and safety regulations should be observed.

10 Durability

10.1 Based on historical evidence and testing, the products, when incorporated in a wall cladding system, can be expected to have a service life in excess of 30 years.

10.2 The performance of the coating will depend upon the colour chosen, the building location, the façade aspect and the immediate environment.

10.3 When coated with a PVDF paint and in a non-corrosive atmosphere, the products can be expected to retain a good appearance for up to 20 years. In coastal or severe industrial regions, this is reduced to 15 years. Colour change will be generally small and uniform on any one elevation.

10.4 When coated with a polyester paint and in a non-corrosive atmosphere, the products can be expected to retain a good appearance for up to 15 years. In coastal or severe industrial regions, this is reduced to 10 years. Colour change will be generally small and uniform on any one elevation.

11 Reuse and recyclability

The panels are partially composed of aluminium, which can be separated from the polyethylene and recycled.

Installation

12 General

12.1 Reynobond Architecture Wall 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.

12.2 Installers must be trained by the Certificate holder, who can provide technical assistance at the design stage and at the start of the installation.

12.3 If significant colour variations between batches is likely, it may be necessary to mix the panels from different pallets so as to obtain a uniform shade over the façade.

13 Procedure

13.1 Based on a preliminary survey of the wall, and the architectural/structural design, a grid layout for the sub-frame is prepared.

13.2 The aluminium sub-frame is attached to the substrate wall via brackets.

13.3 For a riveted system, the panels are fixed directly to the sub-frame with aluminium rivets (see Figure 1).

Technical Investigations

14 Investigations

14.1 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.

14.2 An assessment was made of the panels' rigidity, durability and behaviour in relation to fire.

14.3 Based on a user-survey, an assessment was made of the panels' practicability of installation and the performance in use.

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

Bibliography

BS 8414-1 : 2015 + A1 : 2017 *Fire performance of external cladding systems — Test method for non-loadbearing external cladding systems applied to the masonry face of a building*
BS 8414-2 : 2015 + A1 : 2017 *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 573-3 : 2013 *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Chemical composition and form of products*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions — Wind actions*
NA to BS EN 1991-1-4 : 2005 + A1 : 2010 UK National Annex to *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 9001 : 2008 *Quality management systems — Requirements*

BRE Report BR 135 : 2013 *Fire Performance of External Insulation For Walls of Multistorey Buildings*

ETAG 034 : 2012 *Guideline for European Technical Approval of Kits for External Wall Claddings*

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 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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