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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
12/4901
Product Sheet 1

VITRABOND RAINSCREEN CLADDING SYSTEMS

VITRABOND ALUMINIUM COMPOSITE RAINSCREEN CLADDING PANELS

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Vitrabond Aluminium Composite Rainscreen Cladding Panels, a composite panel of aluminium and polyethylene, used to provide a decorative and protective façade over the external walls of new and existing buildings.

AGRÉMENT 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, with suitable support, resist wind and impact actions normally encountered in the UK (see section 6).

Behaviour in relation to fire — the panels have a reaction-to-fire classification of B-s1,d0 (see section 7).

Air and water penetration — the cladding restricts the passage of water entering the cavity. Any water collecting in the cavity will be removed by drainage and ventilation (see section 8).

Durability — the panels have acceptable durability and can be expected to have a service life of in excess of 30 years (see section 10).

The BBA has awarded this Agrément Certificate to the company named above for the products described herein. These products 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 First issue: 23 March 2012

Brian Chamberlain
Head of Approvals — Engineering

Greg Cooper
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, Vitrabond Aluminium Composite Rainscreen Cladding Panels, if used in accordance with the provisions of 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)

Requirement:	A1	Loading
Comment:		The panels are acceptable for use as set out in sections 4.2 and 6.1 to 6.6 of this Certificate.
Requirement:	B4(1)	External fire spread
Comment:		The panels meet the Class 0 requirements. See sections 7.1 to 7.4 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The panels are acceptable. See sections 10.1 to 10.4 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		This product can contribute to a construction satisfying this Regulation. See sections 9.1 to 9.3, 10.1 to 10.4 and the *Installation* part of this Certificate.
Regulation:	9	Building standards – construction
Standard:	1.1(a)(b)	Structure
Comment:		The panels are acceptable, with reference to clauses 1.1.1[(1)(2)], 1.1.2[(1)(2)] and 1.1.3[(1)(2)]. See sections 4.2 and 6.1 to 6.6 of his Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The panels can contribute to a construction satisfying this Standard, with reference to clauses 2.6.4[(1)(2)], 2.6.5[(1)] and 2.6.6[(2)]. See sections 7.1 to 7.4 of this Certificate.
Standard:	2.7	Spread on external walls
Comment:		The panels can contribute to satisfying this Standard, with reference to clause 2.7.1[(1)(2)]. See sections 7.1 to 7.4 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) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The panels are acceptable. See sections 10.1 to 10.4 and the *Installation* part of this Certificate.
Regulation:	B3(2)	Suitability of materials
Comment:		The panels are acceptable. See sections 9.1 to 9.3 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		The panels can contribute to satisfying this Regulation. See sections 8.1 to 8.2 of this Certificate.
Regulation:	D1	Stability
Comment:		The panels are acceptable as set out in sections 4.2 and 6.1 to 6.6 of this Certificate.
Regulation:	E5	External fire spread
Comment:		The panels are judged to meet the Class 0 requirements. See sections 7.1 to 7.4 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 sections: 3 *Delivery, storage and site handling* (3.4) and 9 *Maintenance* (9.3) of this Certificate.

Additional Information

NHBC Standards 2011

NHBC accepts the use of Vitrabond Aluminium Composite Rainscreen Cladding Panels as part of a cladding system, when installed and used in accordance with this Certificate, in relation to *NHBC Standards,* Chapter 6.9 *Curtain walling and cladding.*

General

It is important for designers, planners, contractors and/or installers to ensure that the installation of Vitrabond Aluminium Composite Rainscreen Cladding Panels is in accordance with the Certificate holder's instructions and the information given in this Certificate.

Technical Specification

1 Description

1.1 The Vitrabond Aluminium Composite Rainscreen Cladding Panels (see Figure 1) comprise two sheets of aluminium alloy bonded to a polyethylene (PE) core.

1.2 The panels are available in various colours and in standard sizes[1] of:

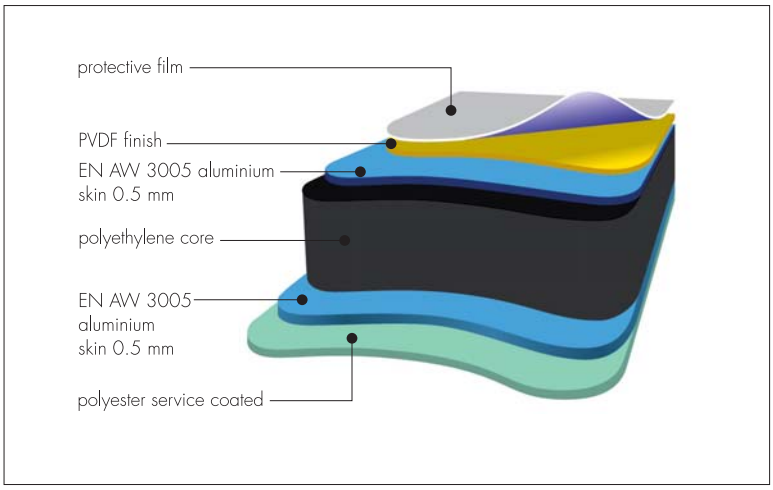
width (mm)	1000, 1250 and 1500
length (mm)	2500, 3200 and 4000
polyethylene (mm)	3
overall panel thickness (mm)	4
aluminium sheet (mm/grade)	0.5/EN AW 3005 H42–H46
weight (kg·m^{-2})	5.84.

(1) Custom widths between 1000 mm and 1500 mm and custom lengths between 1000 mm and 6000 mm are available to special order.

1.3 The outward facing aluminium sheet is coated with a 30 micron layer of polyvinylidene difluoride (PVDF) paint available in various colours. The reverse side is covered with a protective polyester (PE) primer finish.

1.4 The fixing of the panels and the support frames are outside the scope of this Certificate. Subject to the approval of the design engineer they can be fixed to the support frame with rivets and adhesive taking due consideration of thermal movement.

Figure 1 Panel cross-section make-up



2 Manufacture

2.1 Vitrabond is manufactured by extruding a polyethylene core between two sheets of coil-coated aluminium which are fusion bonded in a continual process. The aluminium sheets are coated with polyvinylidene fluoride (PVDF).

2.2 To ensure product quality is consistently maintained to the required specification, 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 non-conformities
- undertaken to carry out the above measures on a regular basis as part of a surveillance process to ensure that standards are maintained and that the product or system remains as Certificated.

3 Delivery and site handling

3.1 The panels are delivered on pallets with edge protection and wrapped in protective material. The pallets bear product details such as type, size, quantity, identification code, manufacturing references and colour.

3.2 The pallets should be stored on dry, flat and level surface, suitably protected from the weather. The protective film on the panels should be removed as soon after installation as is possible.

3.3 The panels should be handled with care to avoid damage. They should be lifted off, rather than slid across, each other.

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 Vitrabond Aluminium Composite Rainscreen Cladding Panels.

Design Considerations

4 General

4.1 The Vitrabond Aluminium Composite Rainscreen Cladding Panels can be incorporated in back-ventilated and drained cladding systems. The cavity behind the cladding should be at least 50 mm wide (see section 8). The ventilation openings should be suitably protected to prevent the ingress of birds, vermin and rain.

4.2 The wall and the supporting frame to which the cladding is fixed should be structurally sound and constructed in accordance with the requirements of the relevant UK Building Regulations and Standards.

4.3 The substrate to which the cladding panel is fixed should be watertight and resistant to the transmission of heat and sound.

4.4 Where insulation (not covered by this Certificate) is provided behind the cladding panels, it 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 bats). The ventilation gap behind the cladding must not be allowed to become blocked, or the insulation dislodged, where it may be vulnerable to wetting.

4.5 To allow for longitudinal expansion, a gap of between 3 mm and 4 mm per metre length between adjacent support rails should be provided. The cladding panels must not be installed across this gap.

4.6 All design aspects of the method of fixing should be checked by a suitably qualified chartered engineer or other appropriately qualified person. Specific construction details, eg flue penetrations, can be obtained from the Certificate holder.

5 Practicability of installation

The panels are suitable for installation by cladding contractors provided they have undergone suitable training by the Certificate holder (see section 11). The Certificate holder can provide advice on installation if required.

6 Strength and stability

6.1 For design purposes, the panel properties given in Table 1 may be adopted.

Table 1 Panel properties

Panel thickness (mm)	Design Flexural resistance[1] (MPa)	Ultimate Flexural modulus (MPa)	Thermal expansion coefficient (10^{-6} cm/cm)
4	53.7	6035	82.5

(1) taking into account a partial factor of 1.25 and factor of safety of 1.5 applied to the characteristic flexural strength.

6.2 The fixings and the support frame are outside the scope of this Certificate. For suitable support systems, the Certificate holder should be consulted for guidance.

6.3 The design of the fixings and supporting framework is the responsibility of the building designer who must be a chartered engineer or appropriately qualified person.

6.4 When designing the supporting framework attachment to the substrate, the design should ensure that the pull-out capacity of any fixings used is adequate.

6.5 The supporting substrate or wall must be able to take the associated wind actions, as well as any racking forces. No contribution from the cladding panel system may be assumed in this regard.

6.6 Wind actions should be calculated in accordance with BS EN 1991-1-4 : 2005 and the UK National Annex.

7 Behaviour in relation to fire

7.1 When tested to BS EN 13501-1 : 2007, the panels achieved a reaction to fire classification of B-s1,d0.

7.2 Accordingly, the products may be regarded as having a Class 0 surface or a 'low risk' material in relation to the Building Regulations. The unexposed side of the products may also be regarded as having a class 0 surface:

England and Wales — Approved Document B

Scotland — Annex 2C[1] and Annex 2E[2]

Northern Ireland — Technical Booklet E.

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

7.3 These performances may not be achieved by all colours of the product and the designations of a particular colour should be confirmed by:

England and Wales — test or assessment in accordance with Approved Document B, Appendix A, Clause 1

Scotland — test to conform with Regulation 9, Annex 2C[1], Table, or Annex 2E[2]

Northern Ireland — test or assessment by a UKAS accredited laboratory or an independent consultant with appropriate experience.

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

7.4 Cavity barriers should be incorporated behind the cladding panels, as required by the national Building Regulations, but should not block essential ventilation pathways. Particular attention should be paid to preventing the spread of fire from within a building breaching the cladding system through window and door openings.

8 Air and water penetration

8.1 The supporting wall must be watertight and reasonably airtight.

8.2 The air gap between the back of the panels and the substrate or insulation should be at least 50 mm for panels with open joints and must be adequately ventilated. Open joints must be at least 10 mm wide. Guidance on recommended cavity widths is given in NHBC Standards 2008, Chapter 6.9.

9 Maintenance

9.1 To maintain the panel appearance, an annual cleaning regime should be carried out using soapy water followed by rinsing with clean water, or alternatively, a pressure hose method can be used. For more difficult chemical soiling, the Certificate holder's specialist advice must be sought.

9.2 Annual maintenance inspections must be carried out to ensure that such features as panels, flashings and seals are in place and ancillary fixings are secure.

9.3 Damaged panels can be replaced. Work carried out should follow the Certificate holder's instructions and all necessary Health and Safety regulations should be observed.

10 Durability

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

10.2 In a non-corrosive atmosphere, the products can be expected to retain a good appearance for up to 20 years and in coastal or severe industrial regions, 15 years. Colour change will be generally small and uniform on any one elevation.

10.3 In normal circumstances, the product has adequate resistance to abrasion and scratching. It is classified as having exceptionally high corrosion resistance.

10.4 When incorporated in an overall wall cladding system, the panels should have an ultimate service life in excess of 30 years.

Installation

11 General

11.1 Vitrabond Aluminium Composite 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 design engineer. The fixing and support systems are outside the scope of this Certificate.

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

Technical Investigations

12 Tests

Tests were carried out by the BBA to determine:

- colour stability in accordance with BS 3900 Parts D8–D10 : 1986
- T-peel test in accordance with BS EN ISO 13399 : 2010
- cross cut test in accordance with BS EN ISO 2409 : 2007
- resistance to corrosion (salt spray) in accordance with BS EN ISO 9227 : 2006
- flexural strength in accordance with BS EN ISO 178 : 2010.

13 Investigations

13.1 An examination was made of external test reports relating to fire testing to BS 476-6 : 1989, BS 476-7 : 1997 and BS EN 13501-1 : 2007, resistance to scratching in accordance with BS EN ISO 1518 : 2001 and resistance to abrasion in accordance with American Federal Specification TT-P-141, Method 6192.

13.2 The manufacturing process and quality control procedures were examined, including an audit of factory production. Details were obtained of the quality and composition of the materials used.

Bibliography

BS 476-6 : 1989 *Fire tests on building materials and structures — Method of test for fire propagation for products*
BS 476-7 : 1997 *Fire tests on building materials and structures — Method to determine the classification of the surface spread of flame of products*

BS 3900-D8 : 1986 *Methods of test for paints — Optical tests on paint films — Determination of colour and colour difference: Principles*
BS 3900-D9 : 1986 *Methods of test for paints — Optical tests on paint films — Determination of colour and colour difference: Measurement*
BS 3900-D10 : 1986 *Methods of test for paints — Optical tests on paint films — Determination of colour and colour difference: Calculation*

BS 8200 : 1985 *Code of practice for design of non-loadbearing external vertical enclosures of buildings*

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

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

BS EN ISO 178 : 2010 *Plastics — Determination of flexural properties*

BS EN ISO 1518 : 2001 *Paints and varnishes — Scratch test*

BS EN ISO 2409 : 2007 *Paints and varnishes — Cross-cut test*

BS EN ISO 9227 : 2006 Corrosion tests in artificial atmospheres — Salt spray tests

BS EN ISO 13399 : 2010 *Bitumen and bituminous binders — Determination of storage stability of modified bitumen*

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
- individual 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.

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