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Agrément Certificate 20/5791

Product Sheet 1

## VITRACORE RAINSCREEN CLADDING SYSTEMS

## VITRACORE G2 ALUMINIUM BONDED RAINSCREEN CLADDING PANEL

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to Vitracore G2 Aluminium Bonded Rainscreen Cladding Panel, used to provide a decorative and protective façade 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 panel, with suitable support, can resist the wind actions normally encountered in the UK (see section 6).

**Behaviour in relation to fire** — the panel has an A2-s1, d0 reaction to fire classification to BS EN 13501-1 : 2018 (see section 7).

**Air and water penetration** — the panel joints will restrict the passage of water entering the cavity. Any water entering the cavity will be removed by drainage and ventilation (see section 8).

**Durability** — the panel has acceptable durability and can be expected to have a service life in excess of 30 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 First issue: 17 September 2020



Hardy Giesler 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 MUST check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.** Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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# Regulations

In the opinion of the BBA, Vitracore G2 Aluminium Bonded Rainscreen Cladding Panel, 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):

132			
S	The Building Regulations 2010 (England and Wales) (as amended)		
Requirement: Comment:	A1	<b>Loading</b> The product can sustain and transfer the design loads to the structural frame as set out in section 6.5 of this Certificate.	
<b>Requirement:</b> Comment:	B3(4)	Internal fire spread (structure) The product can contribute to satisfying this Requirement. See section 7.2 of this Certificate.	
<b>Requirement:</b> Comment:	B4(1)	<b>External fire spread</b> The product is unrestricted by this Requirement. See sections 7.1 and 7.4 of this Certificate.	
Requirement: Comment:	C2(b)	<b>Resistance to moisture</b> The product, when used within a cladding system, is not watertight but will resist the passage of precipitation to the supporting structure. See section 8 of this Certificate.	
<b>Regulation:</b> Comment:	7(1)	Materials and workmanship The product is acceptable. See section 10 and the <i>Installation</i> part of this Certificate.	
<b>Regulation:</b> Comment:	7(2)	Materials and workmanship The product is unrestricted by this Regulation. See section 7.4 of this Certificate.	
E Star	The Buil	Iding (Scotland) Regulations 2004 (as amended)	
Regulation: Comment:	8(1)(2)	<b>Durability, workmanship and fitness of materials</b> The product can contribute to a construction satisfying this Regulation. See sections 9 and 10 and the <i>Installation</i> part of this Certificate.	
Regulation:	9	Building standards applicable to construction	
Standard: Comment:	1.1(a)(b)	Structure The product is acceptable, with reference to clause $1.1.1^{(1)(2)}$ of this Standard. See section 6.5 of this Certificate.	
Standard: Comment:	2.4	Cavities The product can contribute to satisfying this Standard, with respect to clause $2.4.2^{(1)(2)}$ . See section 7.2 of this Certificate.	
Standard: Comment:	2.6	Spread to neighbouring buildings The product is unrestricted by this Standard, with respect to clauses $2.6.4^{(1)(2)}$ , $2.6.5^{(1)}$ and $2.6.6^{(2)}$ . See sections 7.1 and 7.4 of this Certificate.	
Standard: Comment:	2.7	Spread on external walls The product is unrestricted by this Standard, with respect to clause $2.7.1^{(1)(2)}$ . See sections 7.1 and 7.4 of this Certificate.	
Standard: Comment:	3.10	Precipitation The product will contribute to satisfying this Standard, with reference to clauses $3.10.1^{(1)(2)}$ and $3.10.5^{(1)(2)}$ . See section 8 of this Certificate.	

Standard: Comment:	7.1(a)(b)	Statement of sustainability 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 $6^{(1)(2)}$ .	
		<ol> <li>Technical Handbook (Domestic).</li> <li>Technical Handbook (Non-Domestic).</li> </ol>	
	The Bui	The Building Regulations (Northern Ireland) 2012 (as amended)	
Regulation:	23(a)(i)	Fitness of materials and workmanship	
Comment:	(iii)	The product is acceptable. See section 10 and the <i>Installation</i> part of this Certificate.	
Regulation:	28(b)	Resistance to moisture and weather	
Comment:	.,	The product can contribute to satisfying this Regulation. See section 8 of this Certificate.	
Regulation:	30	Stability	
Comment:		The product is acceptable as set out in section 6.5 of this Certificate.	
Regulation:	35(4)	Internal fire spread - Structure	
Comment:		The product is unrestricted by this Regulation. See section 7.2 of this Certificate.	
Regulation:	36(a)	External fire spread	
Comment:		The product is unrestricted by this Regulation. See sections 7.1 and 7.4 of this Certificate.	

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

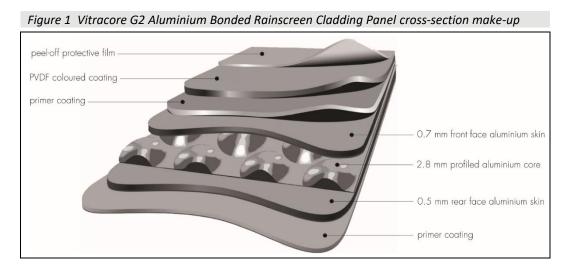
Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

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

## **Technical Specification**

## **1** Description

1.1 Vitracore G2 Aluminium Bonded Rainscreen Cladding Panel (see Figure 1 and section 1.2) consists of aluminium dimple core with a sheet of aluminium alloy bonded to each side. The outward-facing aluminium sheet is covered with a 17 - 20 microns layer of PPG polyvinylidene difluoride (PVDF) coating. The reverse side is covered with a protective polyester primer finish.



1.2 The panel and its fixings have the following characteristics:

#### Panel

	1250 and 1500	
Width (mm)	1250 and 1500	
Length (mm)	2500, 3200 and 4000	
Coating – outward facing, PVDF PPG (μm)	17 - 20	
Polyester primer (μm)	6 - 9	
Aluminium sheet front face skin (mm)	0.7	
Adhesive (µm)	70 - 90	
Core, thickness (mm)	2.8	
Adhesive (µm)	70 - 90	
Aluminium sheet rear face skin (mm)	0.5	
Coating – reverse facing, Polyester primer (µm)	6 - 9	
Overall panel thickness (mm)	4 (±2%)	
Density of dimples (/m <sup>2</sup> )	11000	
Panel weight (kg·m <sup>−2</sup> )	4.4	
Top coat colour	Any variation <sup>(1)</sup>	
Panel format	Flat/Bonded	
Aluminium grade		
Face skin	EN AW-3003 H24 to BS EN 573-3 : 2019	
Core	EN AW-1100 H0 to BS EN 573-3 : 2019	
Rear skin	EN AW-3003 H24 to BS EN 573-3 : 2019	

Note: Custom widths and lengths are available to special order. Widths and lengths greater than specified are outside the scope of this Certificate.

(1) No other variation in coating composition or manufacturer besides top coat colour is covered under this Certificate.

#### **Fixings**

Specification of panel fixings to subframe rail:

rivets — Fixfast R-SS-LF 4.8 x 16, 4.8 mm body diameter, 14 mm head diameter, 16 mm long, stainless steel.

1.3 Ancillary components for use with the panel, but outside the scope of this Certificate, are:

- screws Fixfast DF3-SSA4-P-5.5 x 35 (no washer) 35 mm in length, 5.5 mm body diameter, used to fix the rails to wall brackets
- support sub-frame typically aluminium (rails, wall brackets and fixings)
- substrate fixings — used to fix wall brackets to the substrate wall (specification dependent on the strength of the substrate)
- substrate wall
- insulation rigid or semi-rigid insulation boards •
- breather membrane

- cavity barriers
- protective cavity mesh
- horizontal joint profiles
- bird's beak profiles.

## 2 Manufacture

2.1 The panel is manufactured by laminating the core between two sheets of coil-coated aluminium, which is bonded in a continuous process. The outer aluminium sheets are coated with primer and PVDF finish and a peel-off protective film is added.

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.

## 3 Delivery and site handling

3.1 The panels are delivered to site 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 a dry, flat and level surface, suitably protected from the weather. The protective film on the panel 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 other panels.

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 measures observed.

### Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Vitracore G2 Aluminium Bonded Rainscreen Cladding Panel.

### Design Considerations

### 4 Use

4.1 Vitracore G2 Aluminium Bonded Rainscreen Cladding Panel 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).

4.2 The panels can be installed in either the vertical or horizontal plane.

4.3 The panels are installed with horizontal and vertical open joints of 10 mm width. Horizontal joints are closed with bird's beak profiles.

4.4 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.

4.5 The substrate 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.

4.6 Ventilation and drainage must be provided behind the panels. All ventilation openings around the periphery of the system should be suitably protected with mesh to prevent the ingress of birds, vermin and insects.

4.7 Any insulation (outside the scope of this Certificate) installed behind the panels must 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 a breather membrane should be provided over its outer face to prevent its performance being diminished by moisture. The ventilation pathway behind the cladding must not be allowed to become blocked, or the insulation dislodged, where it may be vulnerable to wetting.

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

## **5** Practicability of installation

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

## 6 Strength and stability

6.1 Wind actions should be calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. Higher pressure coefficients applicable to corners of the building should be used in the locations recommended in this Standard. In accordance with BS EN 1990 : 2002 and its UK National Annex, it is recommended that a partial load factor of 1.5 is used to determine the design wind load to be resisted by a cladding system incorporating the Vitracore G2 panels.

6.2 The supporting substrate wall must be able to take the associated wind actions, as well as any racking forces. No contribution from the panels and subframe may be assumed in this regard.

6.3 The designer should ensure that:

- the design of the sub-frame and its fixings is in accordance with the relevant codes and Standards, such as to limit mid-span deflections (ie length span deflections to L/200 and cantilever deflections to L/150)
- the panels are fixed to the sub-frame using the specified fixing mechanisms (see section 1.2)
- the specified fixings have adequate tensile and pull-out strength to resist the applied actions
- fixing of the support brackets to the supporting wall has adequate 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 of the fixings. The characteristic pull-out resistance should be determined in accordance with the guidance given in EOTA TR055 : 2016, using 50% of the mean value of the five smallest measured values at the ultimate load.

6.4 Wind load tests carried out on a wall comprising Vitracore G2 Aluminium Bonded Rainscreen Cladding Panel, fixed to Vitrafix L ( $60 \times 40 \times 2 \text{ mm}$ ) and T (60 by 100 by 2 mm) vertical rails supports spaced at 425 mm centres horizontally using R-SS-LF-4.8x16 rivets – with vertical and horizontal spacing of 425mm, with horizontal joints closed off with bird's beak profile, achieved a design resistance<sup>(1)</sup> of 1.8 kN·m<sup>-2</sup>.

(1) Derived by dividing the wind load test result by a partial factor of 2.0.





Table 1 Panel properties					
Panel thickness (mm)	Characteristic flexural stress (MPa)	Characteristic flexural modulus (MPa)			
4	41.87	3855			

#### Impact

6.6 Hard and soft body impact tests were carried out in accordance with CWCT Technical Note 76. The panel is suitable for use in all Use Categories as defined in EAD 090062-00-0404, an extract of which is reproduced in Table 2 of this Certificate.

Table 2 Definition of Use Categories (reproduced from EAD 090062-00-0404 Table G.2)

Use	Description			
Category				
I	A zone readily accessible at ground level to the public and vulnerable to hard body impacts but not			
	subjected to abnormally rough use.			
П	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.				
111	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.			

## **7** Behaviour in relation to fire



7.1 The external surface of the panel has a reaction to fire classification of A2-s1, d0<sup>(1)</sup> in accordance with BS EN 13501-1 : 2018. This relates to the full thickness and colour range referred to in section 1 of this Certificate.

(1) This classification is valid only for substrate walls with a minimum density of 870kg/m<sup>3</sup>, a minimum thickness of 11 mm and a fire performance of A2-s1,d0 or better.

7.2 The reverse side of the panel (facing into the cavity) has not been classified. Designers should refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for substrate fire performance, cavity barriers, service penetrations and combustibility limitations for other materials and components used in the overall wall construction, for example, thermal insulation.

7.3 Designers should refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for substrate fire performance, cavity barriers, service penetrations and combustibility limitations for other materials and components used in the overall wall construction, for example, thermal insulation.



7.4 The panel is not subject to any restriction on building height or proximity to boundaries.

### 8 Air and water penetration



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

8.2 The substrate wall to which the cladding is fixed must be weathertight and reasonably airtight satisfying the requirements of the relevant national Building Regulations and Standards.

8.3 To satisfy the NHBC requirements (see *NHBC Standards* 2020, Chapters 6.2, 6.9 and 6.10.18), the minimum clear, drained and ventilated cavity width between the back of the cladding panel and front of the substrate wall (or insulation if installed within the cavity) must be 50 mm.

8.4 In addition, a minimum ventilation area of 5000 mm<sup>2</sup> per metre run of cladding at the building base point and at the roof edge, is required.

8.5 Any water collecting in the cavity owing to rain or condensation will be removed by drainage and ventilation.

### 9 Maintenance and repair



9.1 To maintain the panel appearance, a bi-annual cleaning regime should be carried out using soapy water followed by rinsing with clean water; alternatively, a pressure hose method can be used (outside the scope of assessment). 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 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 When incorporated in an overall wall cladding system, the panel should have a service life in excess of 30 years if designed, installed and maintained in accordance with this Certificate.

10.2 In a non-corrosive atmosphere, the panel can be expected to retain a good appearance for up to 20 years, and for 15 years in coastal or severe industrial regions.

10.3 In normal circumstances, the panel coating has adequate resistance to abrasion and scratching.

10.4 When tested for cracking in accordance with BS EN ISO 4628-4 : 2003, and peeling the panel coating was found to have adequate resistance.

10.5 When tested for rapid deformation caused by a falling weight (large-area indenter) in accordance with BS EN ISO 6272-1 : 2011, the panel coating was found to have satisfactory resistance to cracking or peeling.

10.6 The performance of the coating will depend upon the colour chosen, building location, façade aspect and immediate environment. Colour change will be generally small and uniform on any one elevation.

### 11 Reuse and recyclability

Both the aluminium outer skins and core of the panel can be recycled.

## 12 General

12.1 Vitracore G2 Aluminium Bonded Rainscreen Cladding Panel must be installed in accordance with the Certificate holder's recommendations, the requirements of this Certificate and the specifications laid down by the design engineer.

12.2 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.

12.3 Installation of the panel should be carried out between temperatures of 5 and 25°C. Extremes of temperature must be avoided.

12.4 The panel must be mounted to allow for thermal expansion movement. When the panel is secured, allowance for expansion must also be made by the appropriate use of clearance holes at fixings.

12.5 The panel can be worked by conventional techniques in accordance with the Certificate holder's instructions. These include sawing and cutting, drilling and riveting. It is essential that the correct tools, in good condition, are used to prevent any damage to the coating, and that swarf is removed.

12.6 The panel may be fabricated for installation in either the vertical or horizontal plane. The panels may be predrilled in the factory or on site.

### **13** Procedure

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

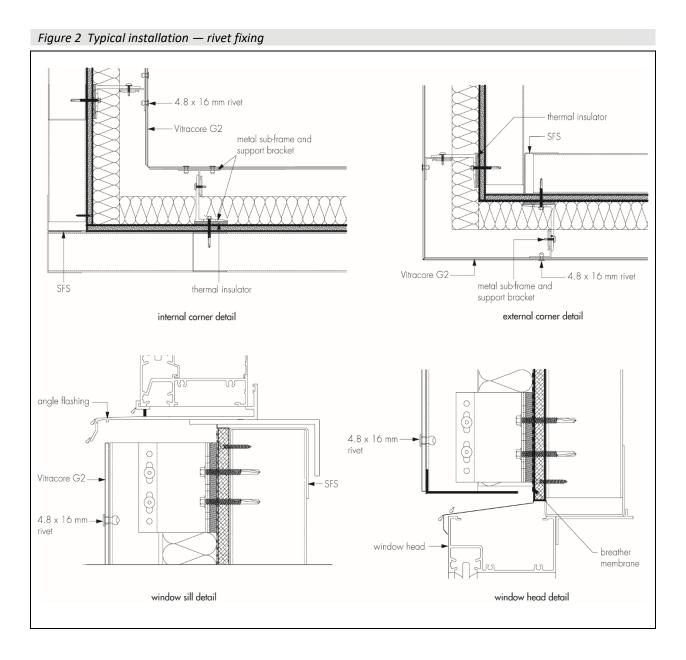
13.2 Wall brackets are fixed to the substrate using appropriate fixings. Vertical spacing between wall brackets should be as specified by the Certificate holder.

13.3 Where required, a rigid or semi-rigid insulation, protected by a suitable breather membrane, can be installed on the substrate wall. The thickness of the insulation should be such as to ensure a minimum ventilation cavity width at the back of the cladding panel is maintained (see section 8.3).

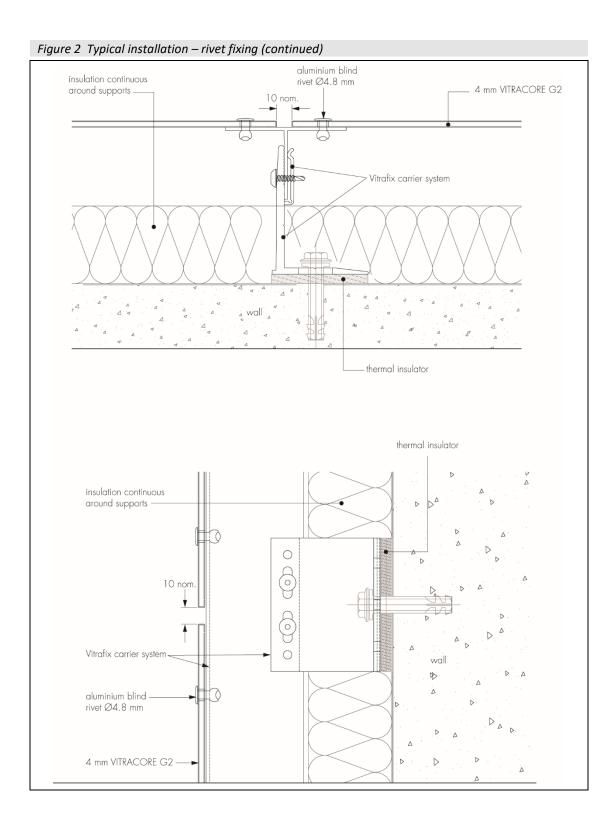
13.4 Vertical support rails are fixed to the brackets with provision for an expansion gap between adjacent vertical rails (see section 4.7).

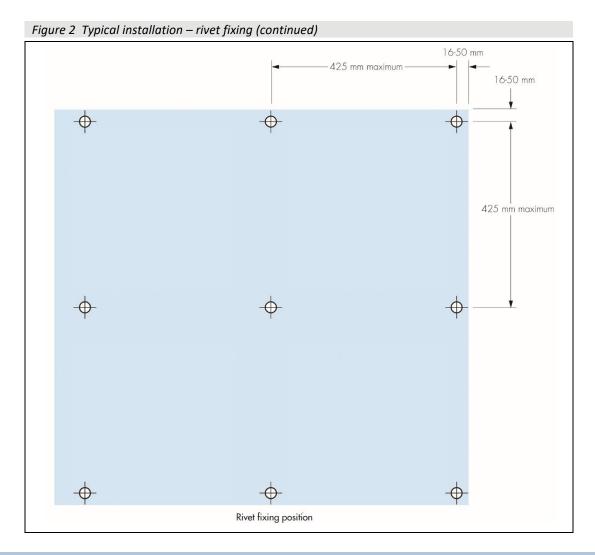
13.5 The panel is fixed to vertical rails ensuring minimum vertical and horizontal gaps between panels are maintained (see sections 4.4 and 8.3). To allow for thermal expansion, the correct specified pre-drilled fixing holes are required for both the panels and support rail. Fixing heads must have sufficient overlap onto the panel and must be concentrically positioned ensuring that the panel is not fixed too tightly, and therefore prevent the face of panel to move and pull causing distortion to the surface.

13.6 Typical installation details are given in Figure 2.



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### **Technical Investigations**

### 14 Tests

Tests were carried out by the BBA and the results assessed to determine:

- resistance of coating to impact
- colour stability
- bond strength (peel test)
- cross cut test
- flexural strength and modulus
- resistance to artificial weathering.

## **15 Investigations**

15.1 An evaluation was made of external test reports relating to:

- wind load resistance
- fire testing
- resistance to scratching
- resistance to abrasion.

15.2 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 EN 573-3 : 2019 Aluminium and aluminium alloys. Chemical composition and form of wrought products — Chemical composition and form of products

BS EN 1990 : 2002 + A1 : 2005 + UK National Annex Eurocode — Basis of structural design

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 : 2018 Fire classification of construction products and building elements — Classification using test data from reaction to fire tests

BS EN ISO 6272-1 : 2011 Paints and varnishes — Rapid-deformation (impact resistance) tests — Falling-weight test, large-area indenter

BS EN ISO 4628-4 : 2003 Paints and varnishes - Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance

EAD 090062-00-0404 Kits for external wall claddings mechanically fixed

EOTA TR055 : 2016 Design of fastenings based on EAD 330232-00-0601

## **16 Conditions**

16.1 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.

16.2 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.

16.3 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.

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

16.5 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.

16.6 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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