

Cupa Pizarras

A Medua SN
Sobradelo de Valdeorras
Orense
32330
Spain

Tel: +34 988 335 410 Fax: +34 988 335 599

e-mail: nnunez@cupapizarras.com

website: www.cupapizarras.com



Agrément Certificate

18/5532

Product Sheet 1

CUPACLAD CLADDING SYSTEMS

CUPACLAD 101 AND CUPACLAD 201 CLADDING SYSTEMS

This Agrément Certificate Product Sheet⁽¹⁾ relates to Cupaclad 101 and Cupaclad 201 Cladding Systems, back-ventilated and drained rainscreen cladding systems for use over external masonry, concrete, timber- and steel-frame walls of new and existing commercial and residential 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 systems can safely resist the wind and impact actions described in this Certificate (see section 6).

Behaviour in relation to fire — the slates and the subframe are classified as non-combustible (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 systems will perform effectively as an external cladding with a service life of at least 35 years (see section 10).



The BBA has awarded this Certificate to the company named above for the systems described herein. These systems 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 May 2018

Paul Valentine
Technical Excellence Director

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.
Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

British Board of Agrément

Bucknalls Lane
Watford
Herts WD25 9BA

©2018

tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk

Regulations

In the opinion of the BBA, Cupaclad 101 and Cupaclad 201 Cladding Systems, 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 systems 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 systems can contribute to satisfying this Requirement. See section 7.5 of this Certificate. |
| Requirement: | B4(1) | External fire spread |
| Comment: | | The systems can contribute to satisfying this Requirement. See section 7 of this Certificate. |
| Requirement: | C2(b)(c) | Resistance to moisture |
| Comment: | | The systems will satisfy this Requirement. See section 8 of this Certificate. |
| Regulation: | 7 | Materials and workmanship |
| Comment: | | The systems are acceptable. See section 10 and the <i>Installation</i> part of this Certificate. |



The Building (Scotland) Regulations 2004 (as amended)

| | | |
|--------------------|----------------|--|
| Regulation: | 8(1)(2) | Durability, workmanship and fitness of materials |
| Comment: | | The systems 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: | 1.1(a)(b) | Structure |
| Comment: | | The systems are acceptable, with reference to clauses 1.1.1 ⁽¹⁾⁽²⁾ , 1.1.2 ⁽¹⁾⁽²⁾ and 1.1.3 ⁽¹⁾⁽²⁾ of this Standard. See sections 4.3 and 6 of this Certificate. |
| Standard: | 2.4 | Cavities |
| Comment: | | The systems 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 7.5 of this Certificate. |
| Standard: | 2.6 | Spread to neighbouring buildings |
| Comment: | | The systems 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 systems 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 systems 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)(b) | Statement of sustainability |
| Comment: | | The systems 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 systems under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . | |
| | (1) Technical Handbook (Domestic). | |
| | (2) Technical Handbook (Non-Domestic). | |



The Building Regulations (Northern Ireland) 2012 (as amended)

| | | |
|--------------------|--|--|
| Regulation: | 23(a)(i) | Fitness of materials and workmanship |
| Comment: | (iii)(b)(i) | The systems are acceptable. See section 10 and the <i>Installation</i> part of this Certificate. |
| Regulation: | 28 | Resistance to moisture and weather |
| Comment: | The systems will contribute to satisfying this Regulation. See section 8 of this Certificate. | |
| Regulation: | 30 | Stability |
| Comment: | The systems are acceptable for use as set out in sections 4.3 and 6 of this Certificate. | |
| Regulation: | 35(4) | Internal fire spread - Structure |
| Comment: | The systems can contribute to satisfying this Regulation. See section 7.5 of this Certificate. | |
| Regulation: | 36(a) | External fire spread |
| Comment: | The systems can contribute in satisfying this Regulation. See section 7 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: 3 *Delivery and site handling* (3.1, 3.3 and 3.4) and 11 *General* (11.5) of this Certificate.

Additional Information

CE marking

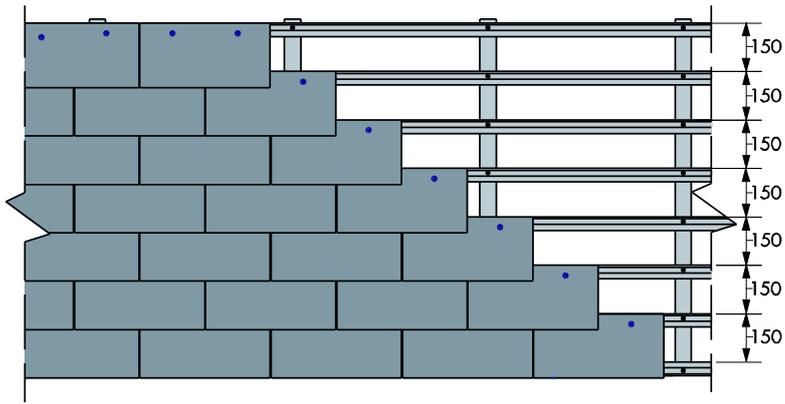
The Certificate holder has taken the responsibility of CE marking the slates, in accordance with harmonised European Standard BS EN 12326-1 : 2014. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

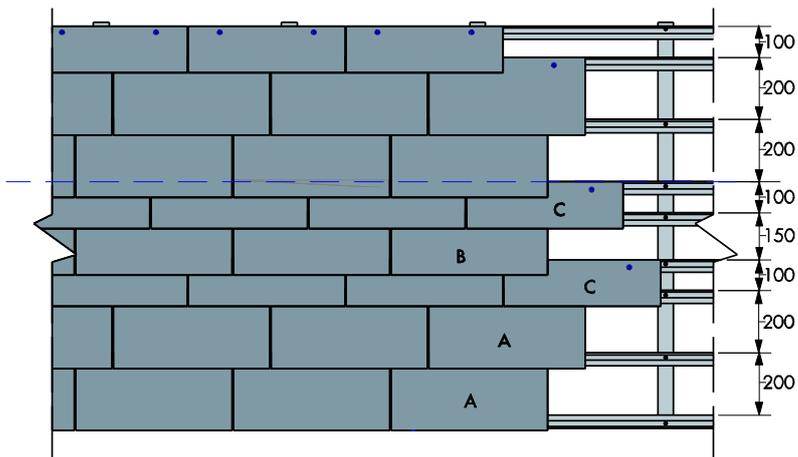
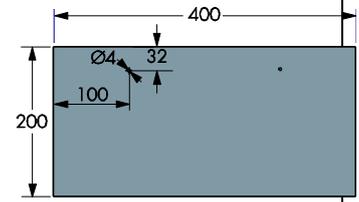
1 Description

1.1 Cupaclad 101 and Cupaclad 201 Cladding Systems are rainscreen cladding systems consisting of natural slates fixed onto proprietary aluminium horizontal profiles, mechanically fastened to an aluminium subframe support. The two systems are differentiated by the fixing mechanisms; Cupaclad 101 features hidden face fixings, whereas Cupaclad 201 features a visible clip fixing system. In addition to this, Cupaclad 101 is available in three versions (Logic, Random and Parallel) depending on the dimension and arrangement of the slates. Details of the four systems are displayed in Figures 1 and 2.

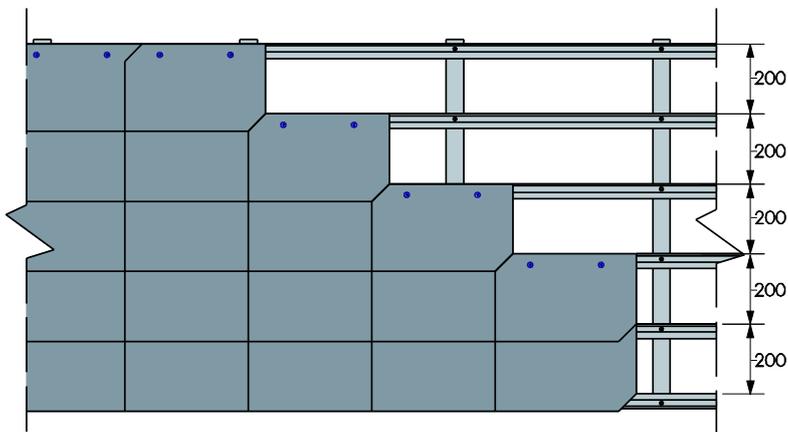
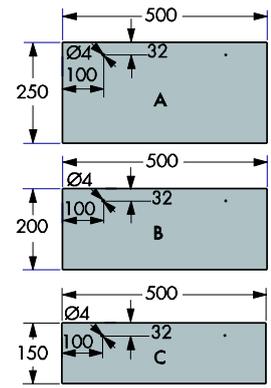
Figure 1 Cupaclad 101 Systems (all dimensions are in mm)



Cupaclad 101 logic



Cupaclad 101 random



Cupaclad 101 parallel

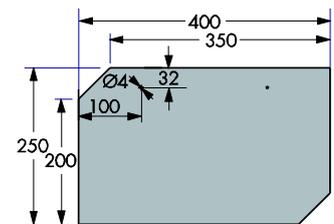
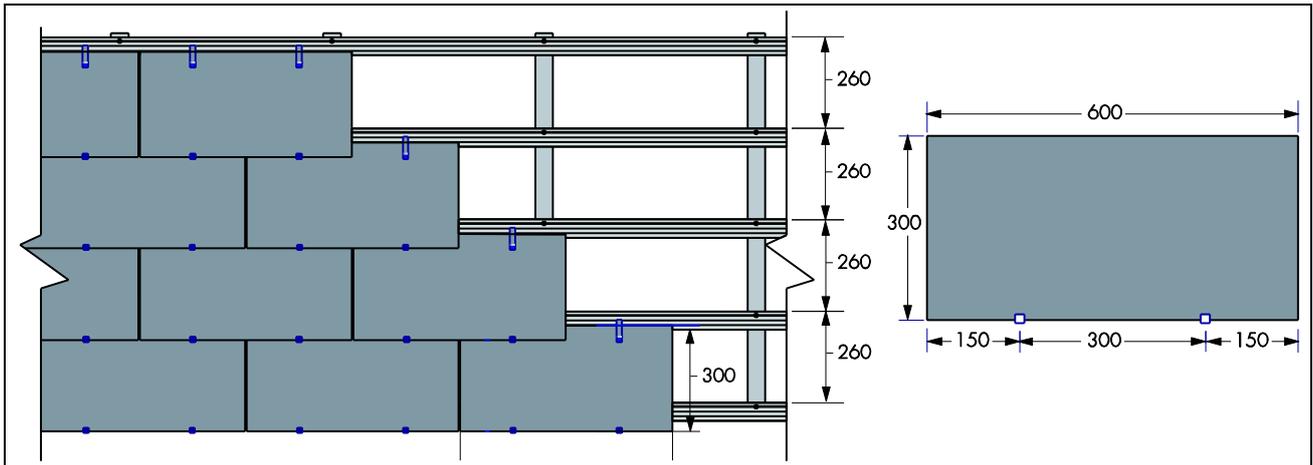


Figure 2 Cupaclad 201 System (all dimensions are in mm)



Cladding elements

1.2 Cupaclad cladding elements are natural slates with a textured surface, manufactured according to BS EN-12326-1 : 2014, and available in the sizes and characteristics given in Table 1.

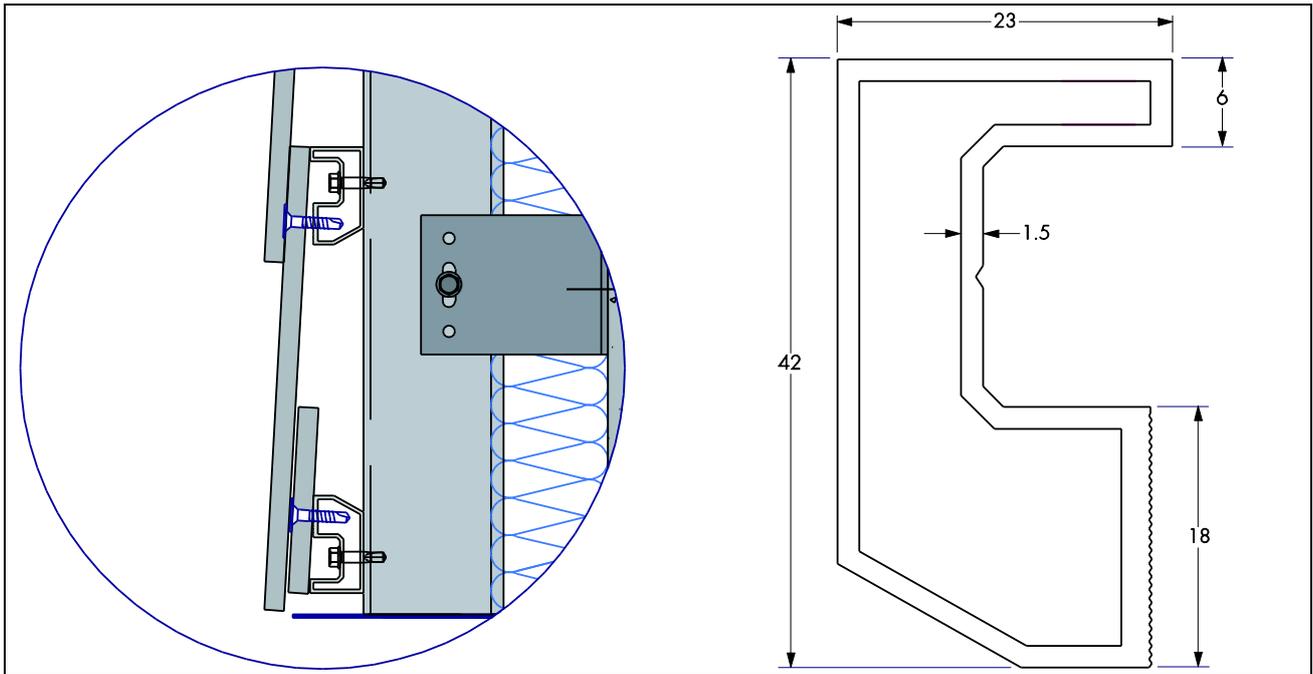
Table 1 Cupaclad cladding elements characteristics

| Characteristic (unit) | Cupaclad 101 Logic | Cupaclad 101 Random | Cupaclad 101 Parallel | Cupaclad 201 Vanguard |
|---|--------------------|-------------------------------------|-----------------------|-----------------------|
| Slate size (mm x mm) | 400 x 200 | 500 x 250 500 x 200 500 x 150 | 400 x 250 | 600 x 300 |
| Nominal thickness (mm) | 7.65 ± 25%* | | 7.5 ± 35%* | |
| Density (kg·m ⁻³) | 2818 | | 2815 | |
| Colour | Black | | | |
| Mean Water absorption (%) | 0.17* | | 0.16* | |
| Coefficient of linear thermal expansion (°C ⁻¹) | 4·10 ⁻⁶ | | | |

Cladding fixing mechanisms — Cupaclad 101 Systems

1.3 Each slate is fixed along the top edge to the Cupaclad 101 Horizontal Profile using two stainless steel self-drilling screws (see Figure 3). The Cupaclad 101 Horizontal Profile is made from 1.5 mm thick aluminium alloy EN AW-6060 T6 to BS EN 755-2 : 2016. Details of the screws are shown in Table 2 of this Certificate.

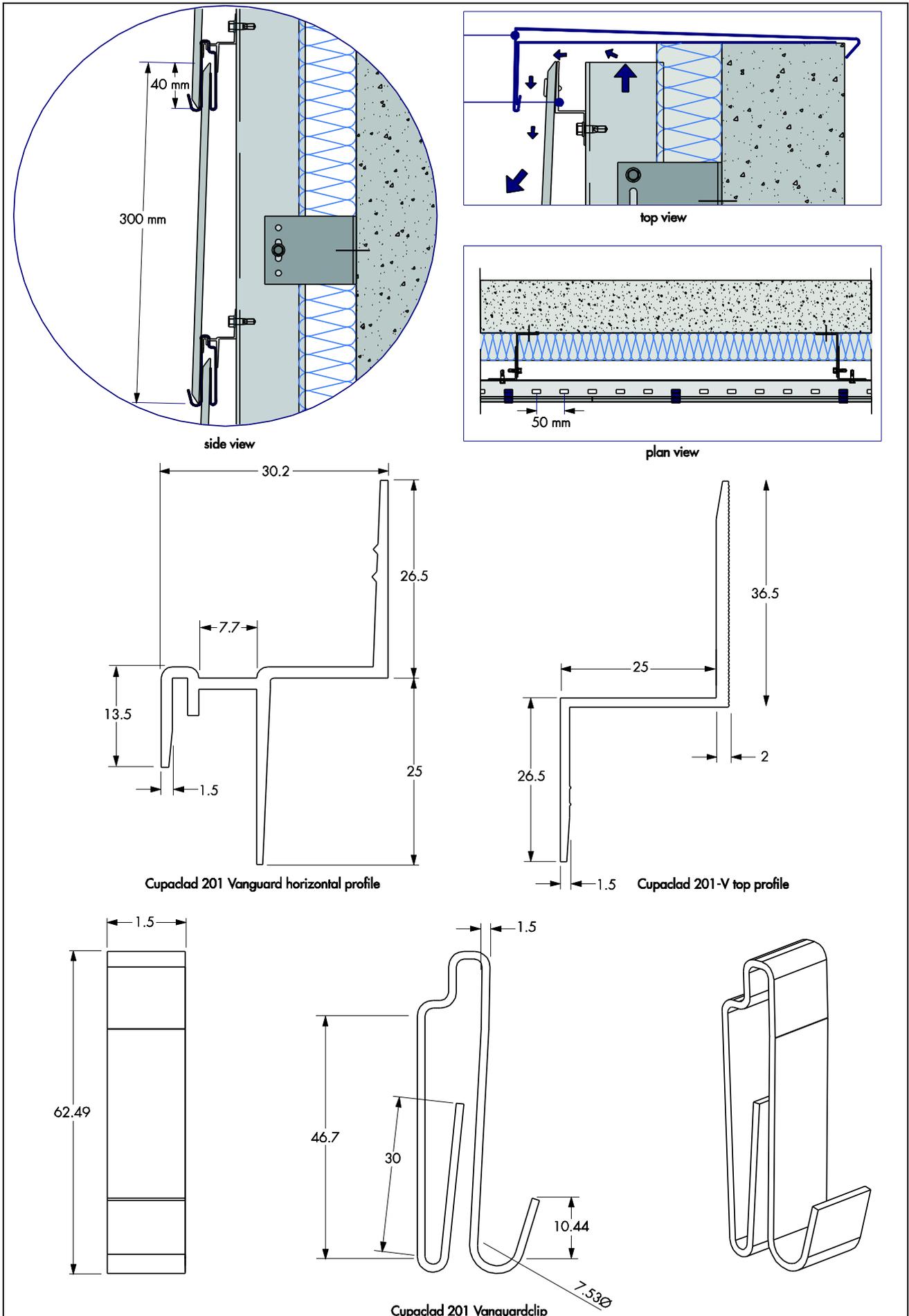
Figure 3 Cupaclad 101 Systems — fixing details (all dimensions are in mm)



Cladding fixing mechanisms — Cupaclad 201 System

1.4 Each slate is fixed using four 201 Vanguard Special Clips housed in the rectangular slots of the 201 Vanguard Horizontal Profile (see Figure 4). The clips, 1.5 mm thick made of A4 stainless steel (1.4401 to BS EN 10088-1 : 2014), have flanges that work like springs; absorbing the differences in thicknesses of the slates. The Vanguard Horizontal Profiles are made from 1.5 mm thick aluminium alloy EN AW-6060 T5 to BS EN 755-2 : 2016. At the top end of the cladding, the slates are fixed by stainless steel self-drilling screws (for further details see Table 3) to a Cupaclad 201-V Top Profile.

Figure 4 Cupaclad 201 System (all dimensions in mm)



Cladding subframe — vertical rails

1.5 For both systems, the slates are fixed via bespoke horizontal rails (see section 1.3 and Figures 2 and 3) to L-shaped vertical rails 50 x 60 mm, made from 2 mm thick aluminium alloy EN AW-6060 T6 to BS EN 755-2 : 2016, supplied in 6 m lengths.

Cladding subframe — wall brackets

1.6 The vertical rails are then connected to an L-shaped substrate wall bracket made from 3 mm thick aluminium alloy EN AW-6060 T6 to BS EN 755-2 : 2016. The wall brackets are available in the following sizes to accommodate different insulation thicknesses and facilitate the distribution of loadings and deflections:

- single bracket — 60 x 40 x 75 - 250 (mm)
- double bracket — 120 x 40 x 75 - 250 (mm).

Interconnecting fixings

1.7 Hexagonal head self-drilling screws are used to connect both the vertical rails to the wall brackets and the horizontal rails to the vertical rails (see Table 2).

Table 2 Cupaclad 101 and Cupaclad 102 Cladding Systems — screws details

| Interconnecting elements | Type of fixings | Material | Dimensions (mm) |
|--|-------------------------------------|---------------------------------|----------------------------------|
| 101 cladding elements to Cupaclad 101 Horizontal Profile | Flat head self-drilling screws | A2 (1.4301 to BS EN 10088-1) | 5.5 x 24 (14.5 head diameter) |
| 201 cladding elements to Cupaclad 201-V Top Profile | | | |
| Horizontal rails to vertical rails | Hexagonal head self-drilling screws | A2 (1.4301 to BS EN 10088-1) | 4.2 x 13 (8.8 head diameter) |

1.8 Ancillary components used with the systems, but outside the scope of this Certificate, are:

- bracket fixings to substrate wall
- insulation
- cavity barriers
- breather membrane
- ventilation protection mesh, perforated sheet or similar
- trim panels
- metal flashings.

2 Manufacture

2.1 The slates are extracted from two quarries in large blocks which are cut into smaller blocks with a diamond wire saw. Each slate is then either sawn off or hand cut before bevelling for final finishing.

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

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management systems of Cupa Pizarras have been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by IQNet and AENOR/NF/ATG/BS (Certificate ES-0747/1997).

3 Delivery and site handling

3.1 The slates are delivered to site in wooden crates (1200 x 700 x 650 mm). Each crate carries both the CE marking and the product label, displaying origin (quarry name), size, shape and quantity of the products, and a production traceability bar code. Each crate can contain up to 620 slates, depending on the size (see Table 3).

Table 3 Slates — packaging details

| System | Slates per pallet | kg per pallet |
|---|-------------------|---------------|
| Cupaclad 101 Logic pallet (40 x 20 cm) | 620 | 980 |
| Cupaclad 101 Parallel pallet (40 x 25 cm) | 480 | 760 |
| Cupaclad 101 Random pallet (50 x 25 cm) | 340 | 800 |
| Cupaclad 101 Random pallet (50 x 20 cm) | 340 | 800 |
| Cupaclad 101 Random pallet (50 x 15 cm) | 550 | 800 |
| Cupaclad 201 Vanguard pallet (60 x 30 cm) | 250 | 900 |

3.2 Pallets of slates should be stored on level ground and not stacked. Slates should be handled with care to avoid damage or breakage.

3.3 Good site practice should be observed to prevent damage to the slates and ancillary components. Protective clothing should be worn as required, and all Health and Safety rules observed.

3.4 Horizontal and vertical rails are delivered to site banded onto wooden pallets with ancillary items in separate cardboard boxes. When handling rails, care should be exercised to avoid injury from sharp edges. Packs of rails should be stacked horizontally on sufficient bearers to prevent distortion, and to a maximum height of one metre.

3.5 Other components should be stored in a safe weatherproof store.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Cupaclad 101 and Cupaclad 201 Cladding Systems.

Design Considerations

4 Use

4.1 Cupaclad 101 and Cupaclad 201 Cladding Systems are satisfactory for use as overlap-jointed, back-ventilated and drained cladding systems on the external walls of new and existing buildings.

4.2 It is important for designers, planners, contractors and/or installers to ensure that the installation of the systems 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 supporting the systems should be structurally sound and capable of supporting the additional load imposed on it by the cladding and must satisfy the requirements of the relevant national Building Regulations and Standards with regard to watertightness, and heat and sound transmission.

4.4 Ventilation and drainage must be provided behind the slates. As the slates have horizontal overlap-joints and vertical butt joints (except in the Cupaclad 101 Parallel System where the vertical joints are overlapped), 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

20 mm, and a minimum ventilation area of 5000 mm² per metre run must be provided at the building base point and at the roof edge. All ventilation openings around the periphery of a cladding system should be suitably protected with a ventilation protection mesh or a perforated sheet or similar, to prevent the ingress of birds, vermin and insects.

4.5 To allow for longitudinal expansion, a minimum gap of 3 mm per metre length between adjacent support rails, as well as vertical rails, should be provided. The slates must not be installed across this gap.

4.6 Any insulation installed behind the cladding must be suitably fixed to the supporting wall to resist forces generated by wind actions and insulation self-weight. 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

Installation of the systems is carried out in accordance with the Certificate holder’s Installation Manual, by contractors experienced with these types of systems and trained and approved by the Certificate holder.

6 Strength and stability

Wind loading



6.1 The wind loads on the wall should be calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex, and the recommendations of BS 5534 : 2014. Special consideration should be given to locations with high pressure coefficients, as additional fixings may be necessary. In accordance with BS EN 1990 : 2002, it is recommended that a partial load factor of 1.5 is used to determine the ultimate wind load to be resisted by the systems.

6.2 The substrate wall must have sufficient strength to resist independently the loads imparted directly by the systems, and the wind actions normally experienced in the UK, as well as any in plane force effects. The supporting subframe must have sufficient stiffness, such that its deformation does not affect the performance of the slates. The systems do not enhance the structural performance of the substrate wall.

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 to span (rail end to end distance)/200 and cantilever deflections to span/150
- the slates are fixed to the sub-frame using the specified fixing mechanisms (see sections 1.3 and 1.4)
- 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 tensile, shear and pull-out strength, and corrosion resistance (outside the scope of 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 : 2016, using 50% of the mean value of the five smallest measured values at the ultimate load.

6.4 For design purposes, the slate properties given in Table 4 may be adopted.

Table 4 Slate properties

| Slate thickness (mm) | Characteristic Modulus of Rupture⁽¹⁾ (MPa) |
|-----------------------------|--|
| 7.5 | Longitudinal 52 Transversal 45 |
| 7.65 | Longitudinal 54 Transversal 36 |

(1) Tested to BS EN 12326-2 : 2011.

6.5 When tested for pull-through resistance in conjunction with the screws defined in sections 1.3 and 1.4, the slates achieved a characteristic failure load of 592.3 N. To establish a design value, the characteristic failure load should be divided by a partial factor of 5.1.

6.6 When tested for pull-out resistance in conjunction with the vertical rails defined in section 1.5, the interconnected screws (see section 1.5) achieved the characteristic failure load 1981.7 N.

6.7 When tested in accordance with ETAG 034 : 2012, Part 1, the Vanguard Special Clip achieved a characteristic failure load 179 N.

6.8 When tested for dynamic wind loading, the Cupaclad 101 Random System and the Cupaclad 201 System, when installed using an 800 and 1000 mm spacing between the vertical rails and the wall brackets respectively, achieved the design wind load resistances given in Table 5.

Table 5 Design wind load resistance

| System | Design wind load resistance (kPa) ⁽¹⁾ |
|----------------------------|--|
| Cupaclad 101 Random System | 3.4 |
| Cupaclad 201 System | 1.6 |

(1) Obtained applying a safety factor of 2 to the test failure value.

6.9 For system arrangements other than those stated in section 6.8, the wind load resistance should be taken as the lesser value between that obtained by considering the slates flexural strength (see Table 4), the resistance to pull-through of the slates in conjunction with specified fixings (see Table 5) or the resistance of the Vanguard Special Clip (see section 6.7) and the resistance of the interconnecting fixings (see section 6.6), also taking into consideration the aspects specified in section 6.3.

Impact



6.10 When tested for resistance to hard and soft body impacts, and using an 800 and 1000 mm spacing between the vertical rails and the wall brackets respectively, both Cupaclad 101 and 201 systems were found to be suitable for use in Use Categories III to IV, as defined in Table 4 of ETAG 034 : 2012, Part 1 (an extract of which is shown in Table 6 of this Certificate).

Table 6 Definition of Use Categories (from ETAG 034 : 2012, Part 1)

| 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. |

7 Behaviour in relation to fire



7.1 The slates and aluminium support systems are classified as 'non-combustible' in relation to the national Building Regulations.

7.2 The slates are suitable for use on, or at any distance from, the boundary.

7.3 For resistance to fire, the performance of a wall incorporating the slates can only be determined by tests from a suitably accredited laboratory, and has not been assessed as part of this Certificate.

7.4 The slate is not subject to any height restriction when used on a substrate, and with components, that satisfy the non-combustibility requirement of materials in the relevant national Building Regulations. When used in conjunction with combustible materials, the whole wall construction must satisfy the requirements of BRE Report BR 135 : 2013.

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

8 Air and water penetration



8.1 The slates have a mean water absorption value of 0.16 and 0.17% to BS EN 12326-2 : 2011 (see Table 1).

8.2 The substrate wall must be watertight and reasonably airtight.

8.3 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.

9 Maintenance



9.1 Buildings where the systems have been installed must be visually inspected regularly for any damages to the slates or the subframe, in order to ensure continued performance.

9.2 Damaged slates should be replaced as soon as practicable. Work carried out should follow the Certificate holder's instructions and the relevant sections of BS 5534 : 2014 and BS 8000-0 : 2014. All necessary Health and Safety regulations should be observed.

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

10 Durability



10.1 The durability and service life of the systems will depend on the building location, immediate environment and general conditions of the components.

10.2 Due to their low water absorption, the slates are not susceptible to frosting. Tests have also confirmed that the slates are not susceptible to hygrothermal ageing.

10.3 In normal UK exposure conditions, the systems will have a service life in excess of 35 years.

Installation

11 General

11.1 Cupaclad 101 and Cupaclad 201 Cladding Systems must be installed in accordance with the Certificate holder's instructions and relevant recommendations of BS 8000-0 : 2014, the requirements of this Certificate, and the specifications laid down by a suitably qualified and experienced individual.

11.2 Installers must be suitably trained cladding contractors, experienced with these types of systems. The Certificate holder will provide advice on installation and can provide on-site technical assistance at the time of installation if required.

11.3 A fully comprehensive site installation guide and instructions are available from the Certificate holder's Technical Design Department. Typical installation details are given in Figures 5 and 6.

11.4 Due to the nature of the manufacturing process, some unevenness on the slates may occur, but this is unlikely to be excessive or obtrusive.

11.5 The slates may be cut on site using a manual cutter to create corners and detailing. Extra care must be taken when handling the slates. Protective gloves and goggles must be used at all times.

11.6 Suitable cavity barriers, as described in section 7.5, should be installed behind the cladding as necessary, to comply with the relevant national Building Regulations relating to fire safety.

11.7 Fixings connecting the slates to the supporting rails should never be overtightened. Should this accidentally happen, the slate must be replaced immediately.

12 Procedure

12.1 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.

12.2 Wall brackets are fixed to the substrate using appropriate fixings. The brackets are installed in alternate courses on either side of the line where the vertical rail is to be fixed. Vertical spacing between wall brackets should not exceed 1000 mm.

12.3 If 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 of 20 mm ventilation cavity width at the back of the cladding.

12.4 Vertical support rails are fixed to the brackets with a maximum horizontal spacing of 800 mm. Fixed point brackets are required to support the top of each vertical rail, whereas sliding point brackets are required along the length of the rail to allow for sufficient movement. In addition, an expansion gap between adjacent vertical rails must be provided (see section 4.5).

12.5 Cupaclad 101 Horizontal Profiles are fixed to the vertical rails using the specified fixings (see Table 2). A minimum of 3 mm gap is to be left between the Cupaclad 101 Horizontal Profiles to allow for thermal movement. The vertical spacing between the Cupaclad 101 Horizontal Profiles depends on the specific system installed:

- Cupaclad 101 Logic 150 mm
- Cupaclad 101 Random 100, 150 or 200 mm (depending on the slate installed)
- Cupaclad 101 Parallel 200 mm
- Cupaclad 101 Vanguard 260 mm.

Cupaclad 101 Systems

12.6 Slates are fixed to the Cupaclad 101 Horizontal Profile using the specified fixings (see Table 2), starting from the bottom of the façade and proceeding upwards to the top.

12.7 With the exception of the first row, all slates are fixed along the top edge with two screws per slate. Holes are pre-drilled, leaving 32 mm from the top edge and 100 mm from the side of the slate.

Cupaclad 201 System

12.8 Starting from the bottom, the clips are fitted in the holes in the Vanguard Horizontal Profiles. Each slate is supported by four Vanguard Special Clips spaced 300 mm apart, two at the top and two at the bottom edge.

12.9 At the top of the façade, or when joining the gutters or flashing, the Cupaclad 201-V Top Profile is used. Slates are fixed in accordance with section 12.7 but leaving a space of 150 mm from the edge of the slate instead.

12.10 A ventilation protection mesh should be installed around the periphery of the system, permitting adequate ventilation as specified in section 4.4, but preventing the intrusion of rodents.

12.11 Metal flashings should be installed around the openings to facilitate water run-off and limit the amount of water entering the cavity.

Figure 5 Typical installation details for Cupaclad 101 Systems

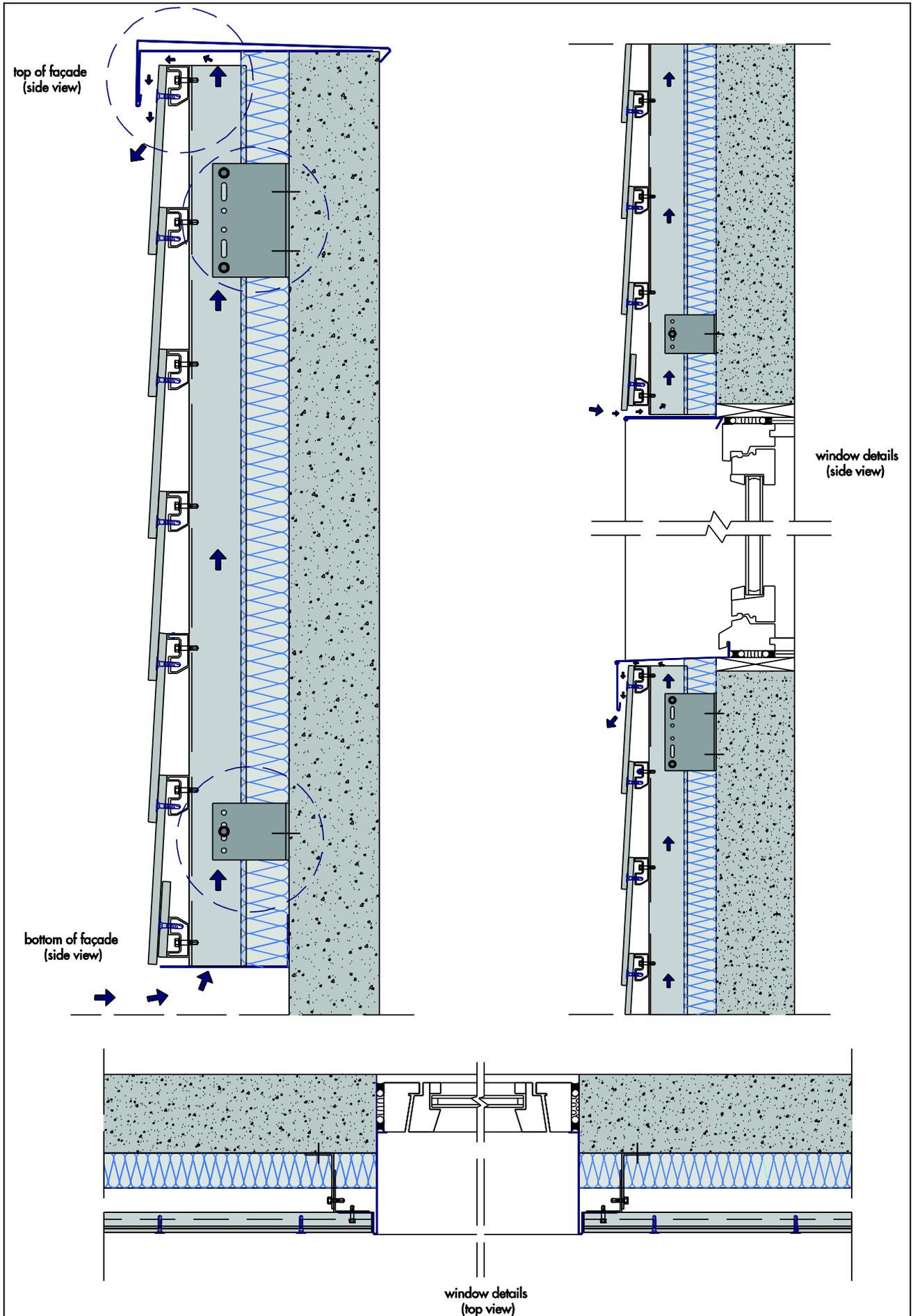
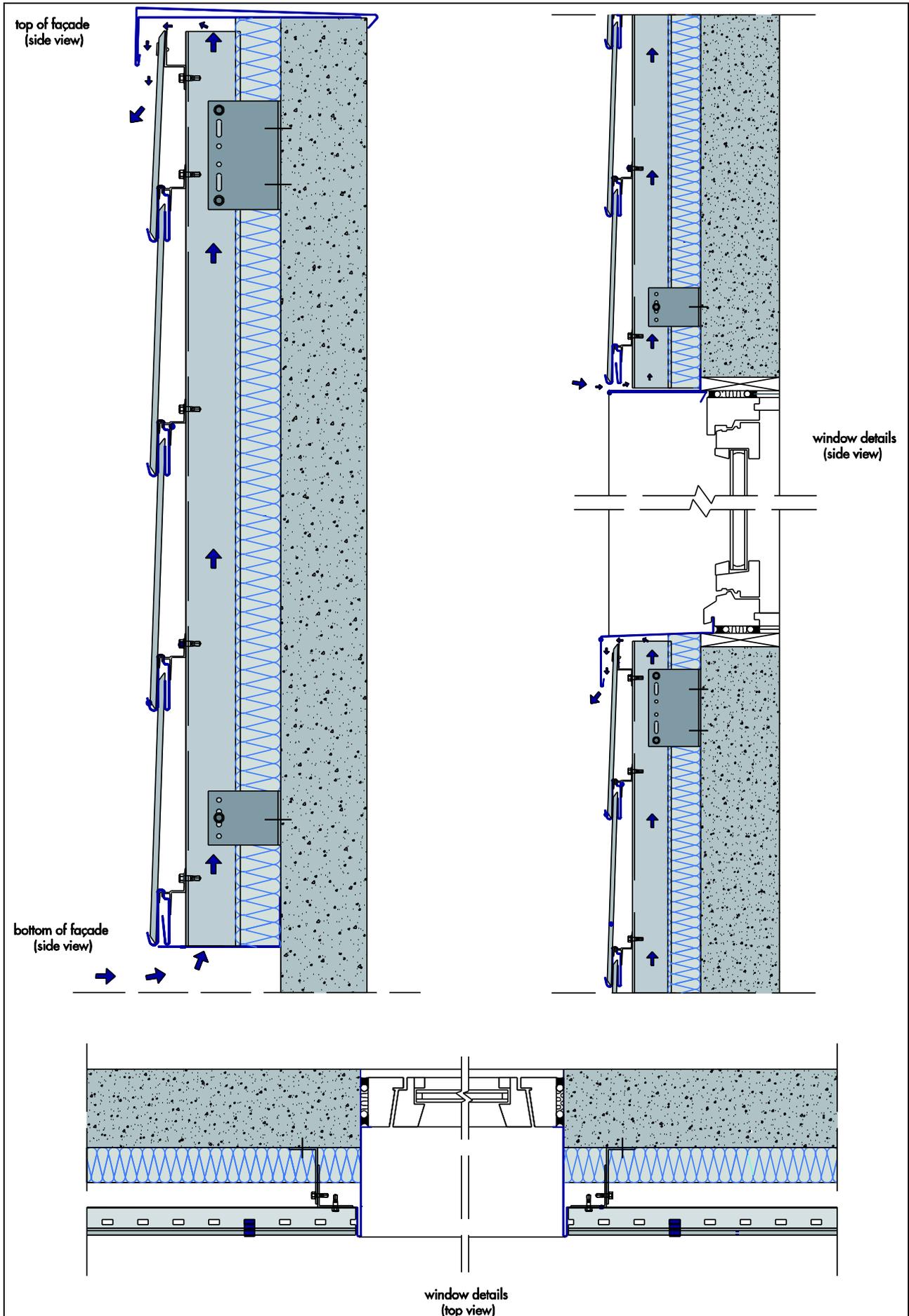


Figure 6 Typical installation details for the Cupaclad 201 System



13 Investigations

13.1 Based on independent test data, an assessment was made of:

- resistance to wind loading and dead loading of the systems
- resistance to pull-through of the slates
- resistance to pull-out and shear of the fixings
- resistance of the metal clip
- impact strength
- material characteristics (density, linear thermal expansion coefficient, water absorption, bending resistance)
- durability
- behaviour in relation to fire.

13.2 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

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

BS 5534 : 2014 + A2 : 2018 *Slating and tiling for pitched roofs and vertical cladding — Code of practice*

BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*

BS EN 755-2 : 2016 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Mechanical properties*

BS EN 1990 : 2002 + A1 : 2005 *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 10088-1 : 2014 *Stainless steels — List of stainless steels*

BS EN 12326-1 : 2014 *Slate and stone for discontinuous roofing and external cladding — Specifications for slate and carbonate slate*

BS EN 12326-2 : 2011 *Slate and stone for discontinuous roofing and external cladding — Methods of test for slate and carbonate slate*

BS EN ISO 9001 : 2008 *Quality management systems — Requirements*

EOTA TR 055 : 2016 *Design of fastenings based on EAD 330232-00-0601*

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

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 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.