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Agrément Certificate

13/4975

Product Sheet 4

ALIVA FACADES SYSTEMS

ALIVA ALUCOVERING RAINSCREEN CLADDING SYSTEM

This Agrément Certificate Product Sheet⁽¹⁾ relates to the Aliva Alucovering Rainscreen Cladding System, comprising aluminium panels attached on aluminium support rails to provide an open jointed, back-ventilated protective and decorative cladding system on external walls of buildings of masonry, timber or steel frame wall construction.

(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 system can be designed to resist the wind loads normally encountered in the UK (see section 6).

Behaviour in relation to fire — the system components have an A1 or A2-s1, d0 classification in accordance with the national Building Regulations (see section 7).

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

Durability — the system will 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 system described herein. This system 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

Paul Valentine
Technical Excellence Director

Claire Curtis-Thomas
Chief Executive

Date of Second issue: 6 August 2019

Originally certificated on 2 February 2017

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.

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Regulations

In the opinion of the BBA, the Aliva Alucovering Rainscreen Cladding System, 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 system satisfies this Requirement. See sections 4.4 and 6 of this Certificate.
Requirement:	B3(4)	Cavities
Comment:		The system is unrestricted by this Requirement. See section 7.3 of this Certificate.
Requirement:	B4(1)	External fire spread
Comment:		The system satisfies this Requirement. See section 7 of this Certificate.
Requirement:	C2(b)(c)	Resistance to moisture
Comment:		The system is not watertight but will resist the passage of rainwater to the supporting structure. See section 8 of this Certificate.
Regulation:	7	Materials and workmanship (applicable to Wales only)
Regulation:	7(1)	Materials and workmanship (applicable to England only)
Comment:		The system is acceptable. See sections 10.1 to 10.3 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 system satisfies this Regulation. See sections 9 and 10.1 to 10.3 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	1.1(a)(b)	Structure
Comment:		The system is acceptable, with reference to clause 1.1.1 ⁽¹⁾⁽²⁾ of this Standard. See sections 4.4 and 6 of this Certificate.
Standard:	2.4	Cavities
Comment:		The system, when used in conjunction with fire-resistant materials, can contribute to satisfying this Standard, with reference to clauses 2.4.1 ⁽¹⁾⁽²⁾ , 2.4.2 ⁽¹⁾⁽²⁾ and 2.4.9 ⁽¹⁾⁽²⁾ . See section 7.3 of this Certificate.
Standard:	2.6	Spread on neighbouring buildings
Comment:		The system can contribute to satisfying this Standard, with reference to clause 2.6.4 ⁽¹⁾⁽²⁾ . See section 7 of this Certificate.
Standard:	2.7	Spread on external buildings
Comment:		The system 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 system is not watertight but will resist the passage of rainwater to the supporting structure, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ to 3.10.3 ⁽¹⁾⁽²⁾ of this Standard. See section 8 of this Certificate.

Standard:	7.1(1)(2)	Statement of sustainability
Comment:		The system can contribute to satisfying 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 system 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)(iii)	Fitness of materials and workmanship
Comment:		The system is acceptable. See sections 10.1 to 10.3 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	Resistance to ground moisture and weather
Comment:		The system is not watertight but will resist the passage of rainwater to the supporting structure. See section 8 of this Certificate.
Regulation:	30	Stability
Comment:		The system is acceptable as set out in sections 4.4 and 6 of this Certificate.
Regulation:	35(4)	Cavities
Comment:		The system is unrestricted by this Regulation. See section 7.3 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The system can satisfy 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: *1 Description (1.2)* and *3 Delivery and site handling (3.1 and 3.4 to 3.6)* of this Certificate.

Additional Information

NHBC Standards 2019

In the opinion of the BBA, the Aliva Alucovering Rainscreen Cladding System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards, Part 6 Superstructure (excluding roofs)*, Chapter 6.9 *Curtain walling and cladding*.

Technical Specification

1 Description

1.1 The Aliva Alucovering Rainscreen Cladding System, which can be installed horizontally or vertically, consists of rectangular extruded or folded aluminium powder-coated or anodised panels in a variety of profiles and sizes, aluminium support rails and wall brackets. The panels are attached to the rails with rivets creating fixed connections and clips and rivets for sliding connections (see Figures 1 and 2). Rivets are used to fix the rails to the wall brackets which are in turn attached to the main timber or steel structural frame, or masonry substrates with suitable fixings (outside the scope of this Certificate).

1.2 The systems comprise:

- Aliva Alucovering Panels⁽¹⁾⁽²⁾⁽³⁾ and Aliva Alucovering-P Panels⁽¹⁾⁽²⁾⁽³⁾ (see Table 1)
 - Aliva Alucovering Panel — the panels are attached to the rail via a fixed connection using two 4.8 x 14 mm K9 rivets, fixing the panel to the rail at one end and the remaining connections being sliding points using aluminium clips with two 4.8 x 14 mm K9 rivets to allow movement (see Figure 1)
 - Aliva Alucovering-P Panel — the panels are attached to the rail via a fixed connection using two 4.8 x 14 mm K9 rivets, fixing the panel to the rail at one end and the remaining connections being sliding points using aluminium clips with two 4.8 x 14 mm K9 rivets to allow movement (see Figure 2)

(1) Polyester powder coating of a minimum 60 µm to a maximum of 80 µm thickness, Qualicoat Class 2 in accordance with BS EN 12206-1 : 2004, BS EN 13438 : 2013 and AAMA 2604-5. Available in different colours.
 (2) Anodic oxidation coating thickness Class AA25 in accordance with BS EN ISO 7599 : 2018.
 (3) Aluminium Alloy EN AW 5005 and EN AW 1050 in accordance with EN 573-3 : 2013 and EN 485-2 : 2016 (yield strength at least Rp02).

Table 1 Alucovering panels

Characteristics (unit)	Type of panel	
	Alucovering	Alucovering-P
Thickness (mm)	2 to 5	2.5 to 3.5
Width (mm)	150 to 500	150 to 450
Length (mm)	250 to 6300	250 to 6300
Mass (kg·m ⁻²)	8 to 13	8 to 13

- Aluminium clips — manufactured from 5.5 mm thick extruded aluminium-alloy of EN AW-6063 T6 grade to BS EN 12020-1 : 2008 and BS EN 12020-2 : 2016. The clips are 60 mm wide and 32 mm long with two 10 mm diameter holes and are shaped to fit onto the top edge of the panels (see Figures 1 and 2)

Figure 1 Alucovering panel detail

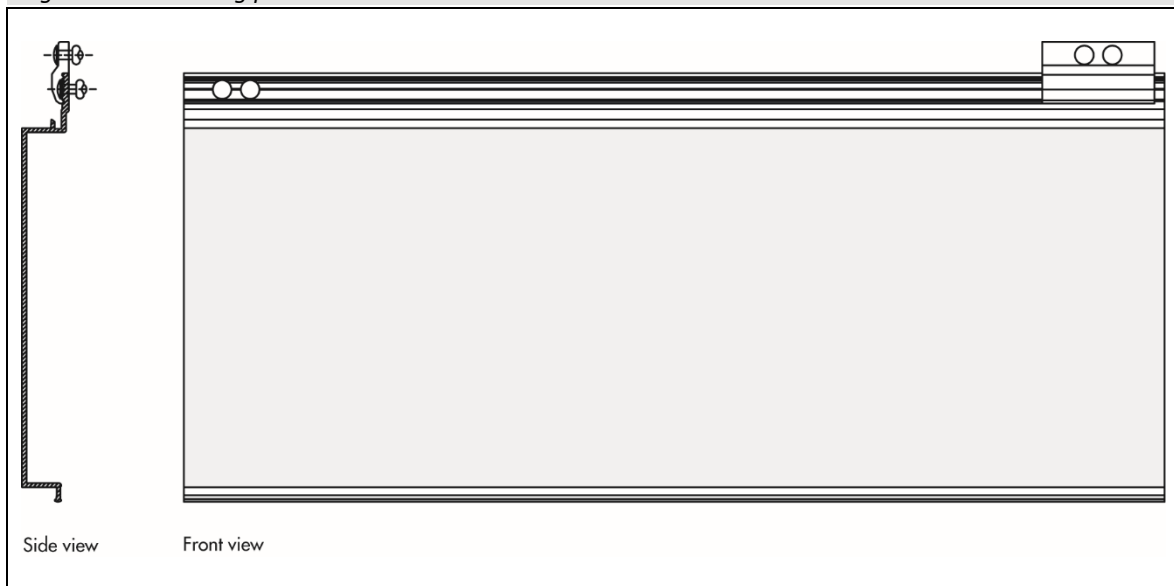
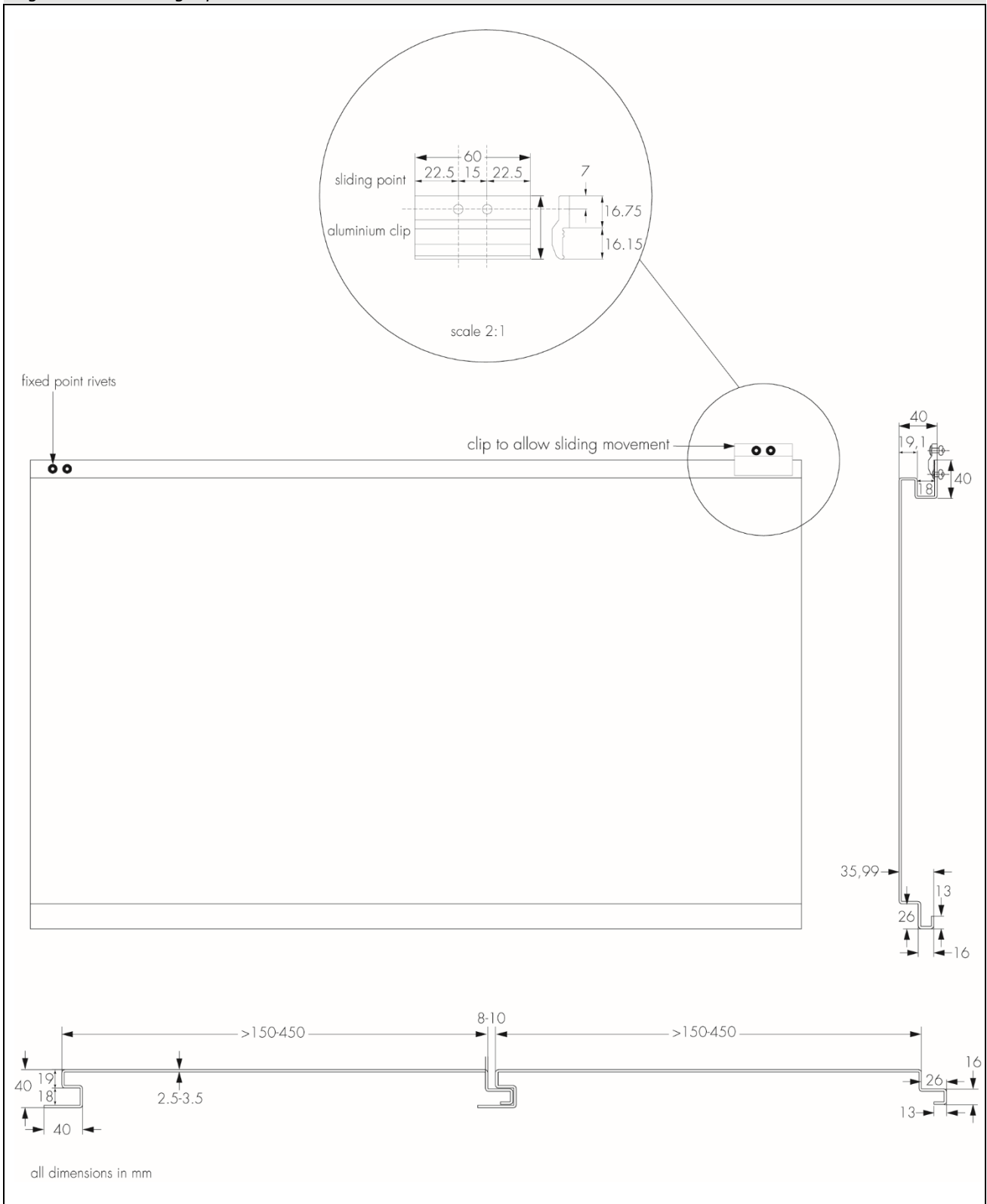


Figure 2 Alucovering-P panel detail



- horizontal/vertical T-rails — manufactured from 2mm thick (minimum) extruded aluminium-alloy of EN AW-6063 T6 grade to BS EN 12020-1 : 2008 and BS EN 12020-2 : 2016. The panels are attached to the T-rail with 4.8 x 14 K9 rivets; two rivets for every fixed/sliding connection. T-rails are supported on L-brackets that are fixed with appropriate fixings⁽¹⁾ to the substrate wall⁽¹⁾. Two TL-rivet is used for the fixed connections and one TL-rivet is used for the sliding connections through the slotted holes, between the T-rail and the L-bracket. The spacing centres of the rails should not exceed 450 mm for Alucovering panels and 600 mm for Alucovering-P panels (see Figure 3)

- box-rails — manufactured from 2 mm thick (minimum) extruded aluminium-alloy of EN AW-6063 T6 grade to BS EN 12020-1 : 2008 and BS EN 12020-2 : 2016. The panels are attached to the box-rail with 4.8 x 14 K9 rivets; two rivets for every fixed/sliding connection. Box-rails are attached to the U-brackets with TSV rivets. Two TSV rivet used for the sliding connection (one on each side of the bracket) and four TSV rivets are used for the fixed connection (two on each side of the bracket). The spacing centres of the rails should not exceed 450 mm for Alucovering panels and 600 mm for Alucovering-P panels (see Figure 4)
- L- and U-brackets — made from aluminium alloy EN AW-6063 T6 to BS EN 12020-1 : 2008 and BS EN 12020-2 : 2016, with a 3 mm (minimum) thickness and various leg lengths. Both types of brackets incorporate slotted holes to accommodate thermal movement. The brackets are fixed to the substrate wall with minimum of 8 mm diameter anchors⁽¹⁾ or self-drilling screws⁽¹⁾ and at maximum 450 and 600 mm centres for Alucovering and Alucovering-P panels respectively. L-brackets are available in two depths, 150 mm deep for the fixed connection and 80 mm deep for the sliding connections. U-brackets are available in two depths; 150 mm deep for the fixed connection and 70 mm deep for the sliding connections (see Figures 5 and 6).

(1) Outside the scope of this Certificate.

- Aliva Rivets — made from stainless steel and aluminium (AlMg 3.5). The range of Aliva Rivets is given in Table 2.

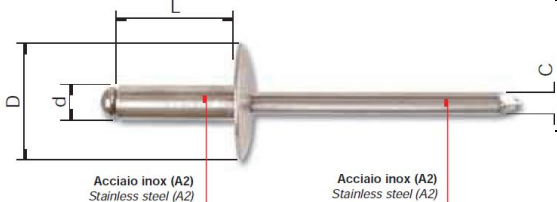
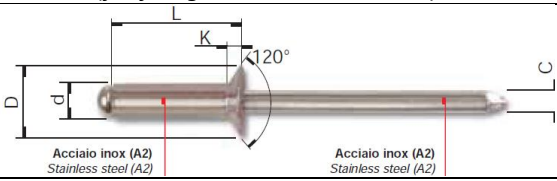
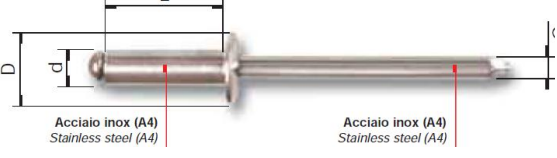
<i>Table 2 Rivet characteristics – all dimensions in mm</i>						
<i>TL rivet (for fixing T-rail to L-bracket)</i>						
	d	L	D	C		Pre-drilled hole diameter
	4.8	14	14	3		5
<i>TSV rivet (for fixing box-rail to U-bracket)</i>						
	d	L	D	K	C	Pre-drilled hole diameter
	4.8	14	9	1.5	3	5
<i>4.8 x 14 K9 rivet (for fixing Alucovering panel to rail)</i>						
	d	L	D	C		Pre-drilled hole diameter
	4.8	14	9	3		5

Figure 3 Aliva Alucovering Rainscreen Cladding System, T-rails connection, plan view of horizontal panel installation

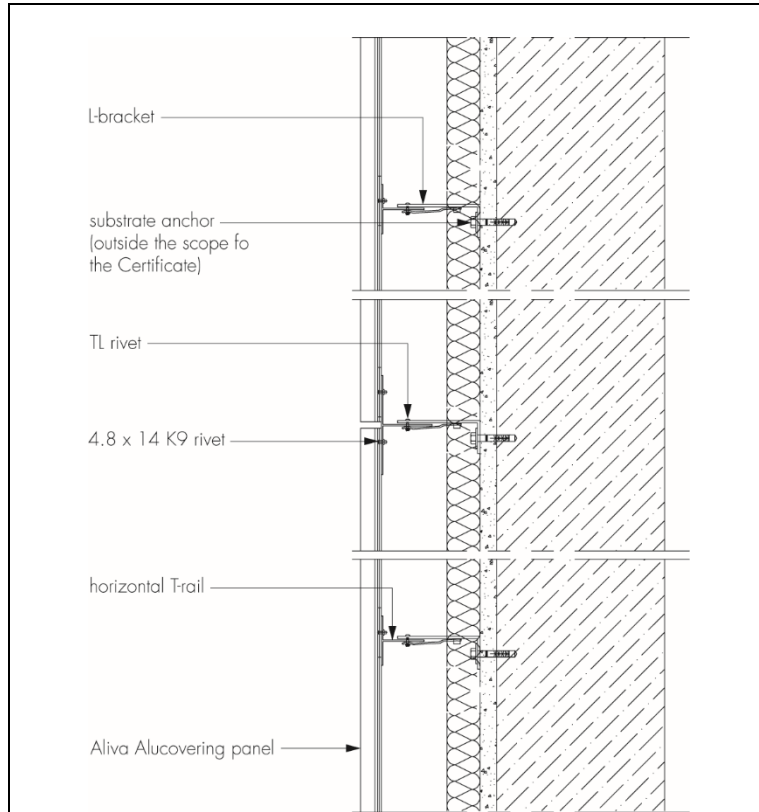


Figure 4 Aliva Alucovering Rainscreen Cladding System, box section connection, cross section of vertical panel installation

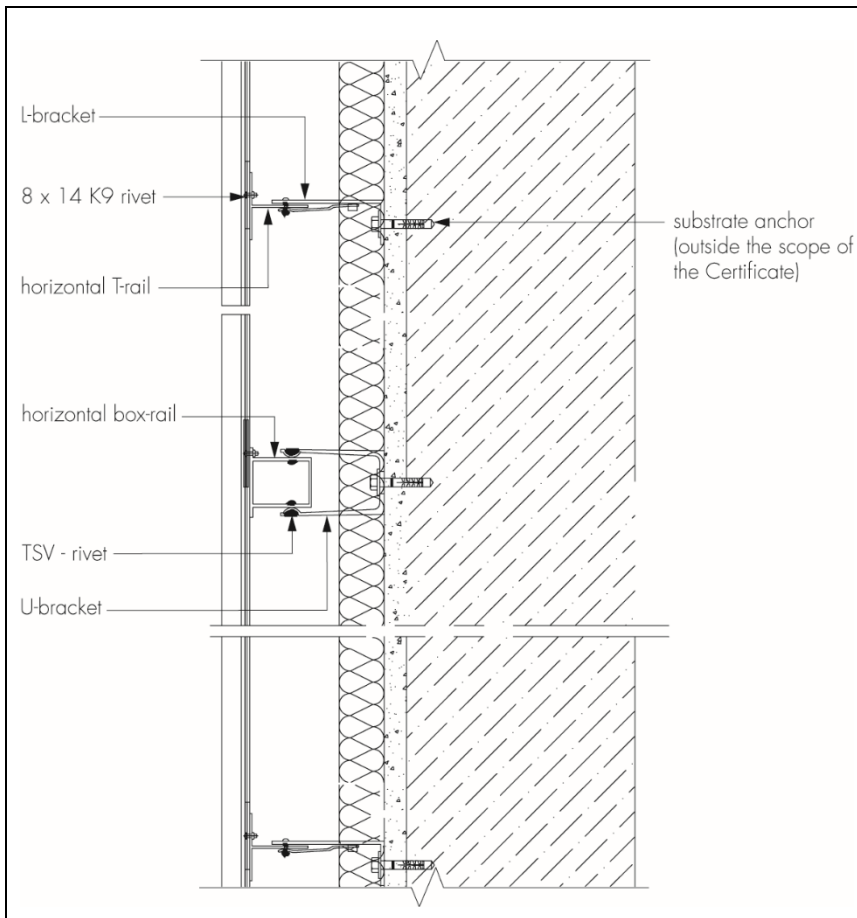


Figure 5 Aliva Alucovering support systems for mounting panels

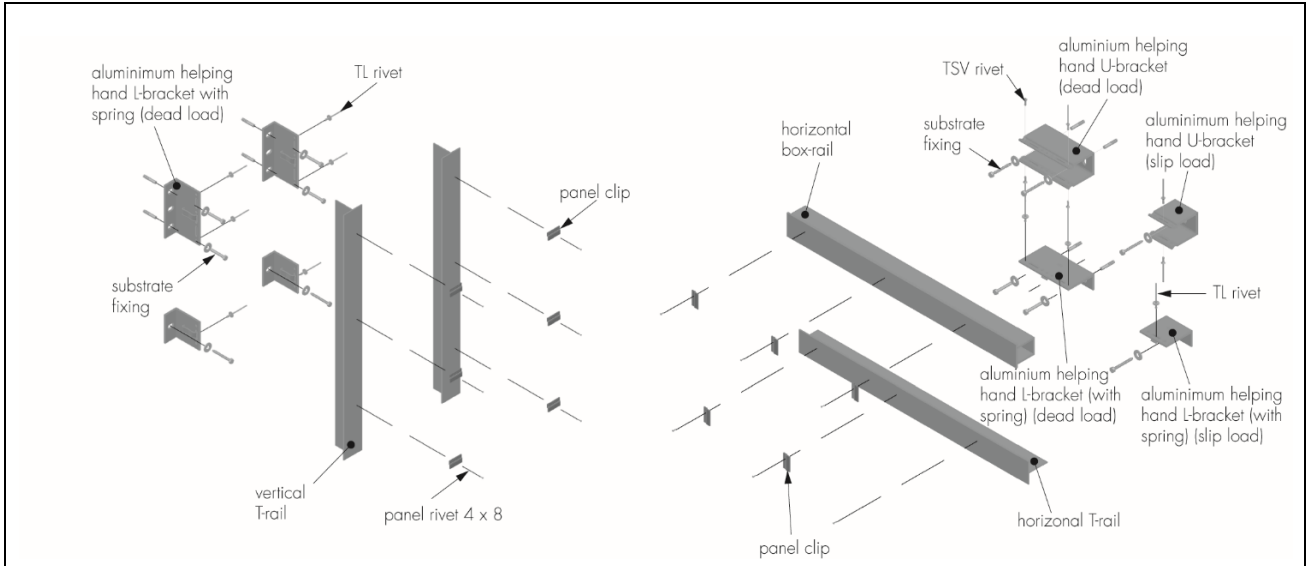
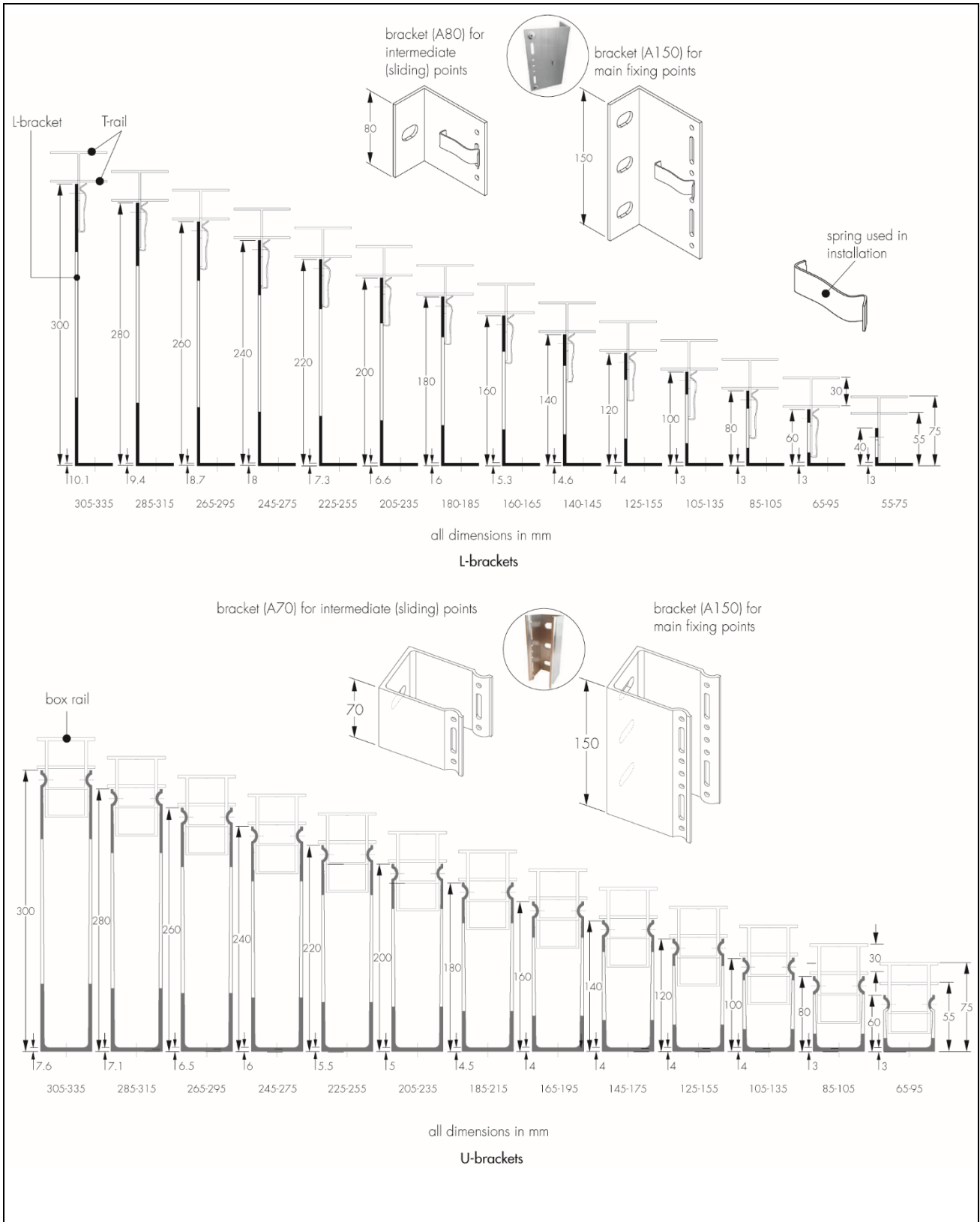


Figure 6 Aliva Alucovering brackets for mounting panels



1.3 Components used with the system are:

- horizontal starter rail
- corner and connectors profiles.

1.4 Ancillary items used with the system, but outside the scope of this Certificate, are:

- insulation (semi-rigid type)
- cavity barriers
- breather membrane
- ventilation protection mesh
- bracket thermal isolation pad
- fixings to substrate wall.

2 Manufacture

2.1 Alucovering panels are manufactured by an extrusion process with edge profiles formed during the same process. Alucovering-P panels are fabricated by folding of flat aluminium sheets into the panel profile.

2.2 As part of the assessment and ongoing surveillance of the 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 as part of a surveillance process to ensure that standards are maintained and that the product or system remains as Certificated.

2.3 The system is marketed in the UK by Aliva UK, 1210 Parkview, Arlington Business Park, Theale, Berkshire RG7 4TY. Tel: 01189 635900, e-mail: (enquiries@gruppovivas.co.uk).

3 Delivery and site handling

3.1 The panels are delivered to site packaged on pallets to avoid possible damage during transportation. The maximum allowed mass per pallet is 1500 kg.

3.2 Each pallet bears a label showing product details including type, size, nominal thickness, quantity and date of production. Each panel is marked with an identification code including manufacturing references and colour.

3.3 Rails are delivered to site banded onto wooden pallets with associated ancillary items in separate cardboard boxes.

3.4 Packs of rails should be stacked horizontally on sufficient bearers to prevent distortion, to a maximum height of 1 m.

3.5 Panels should be handled with care to avoid damage or breakage. Care is required when handling long lengths of rail, particularly at height.

3.6 Care should be exercised when handling rails 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 the Aliva Alucovering Rainscreen Cladding System.

Design Considerations

4 Use

4.1 The Aliva Alucovering Rainscreen Cladding System, when installed in accordance with this Certificate, is satisfactory in providing an open-jointed, back-ventilated protective and decorative rainscreen cladding. The system is for installation onto external walls of buildings of masonry and timber- or steel-framed walls of new or existing buildings .

4.2 It is important for designers, planners, contractors and/or installers to ensure that the installation of the system 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.

4.3 Ventilation and drainage must be provided behind the cladding. The clear cavity between the back of the tile and substrate wall (or insulation if installed within the cavity) must be at least 50 mm wide and ensure that a minimum ventilation area of 5000 mm² per metre run of cladding is provided at the building base point and at the roof edge. All ventilation openings around the periphery of the system should be suitably protected with ventilation protection mesh to prevent the ingress of birds, vermin and insects.



4.4 The wall to which the system is to be fixed must be structurally sound and constructed in accordance with the requirements of the relevant national Building Regulations and Standards:

- timber-framed walls must be designed and constructed in accordance with BS EN 1995-1-1 : 2004 and its UK National Annex , and preservative-treated in accordance with BS EN 351-1 : 2007
- steel-framed substrates must be structurally sound, and designed and constructed in accordance with BS EN 1993-1-1 : 2005 and BS EN 1993-1-3 : 2006, and their UK National Annexes
- masonry walls must be designed and constructed in accordance with the relevant recommendations of BS 8000-3 : 2001, BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006, and their UK National Annexes .

4.5 The wall to which the system is fixed should be watertight and satisfy the requirements for transmission of heat and sound, and constructed in accordance with the requirements of the relevant national Building Regulations and Standards.

4.6 Movement joints should be incorporated into the system and must match movement joints in the supporting structure and substrate wall.

4.7 The maximum distance between the support rails is 450 and 600 mm supporting Alucovering and Alucovering-P panels respectively.

4.8 The system is not considered watertight. Any insulation material installed to the exterior of the supporting structure should comply with the requirements of EAD 090062-00-0404 . Where performance of the insulation can be affected by moisture, a vapour control layer should be installed to external and internal sides of the insulation. Insulation material is outside the scope of this Certificate.

4.9 Insulation material behind the system should be adequately fixed to the substrate wall to resist the negative wind load that may be induced because of the open joint system.

4.10 The size of the open joints between the panels must be 10 mm.

4.11 To allow for thermal expansion, a gap of 8 to 10 mm between the ends of adjacent rails should be provided. This gap, in horizontally installed rail applications, will also allow the drainage of any water collected within the cavity.

4.12 It is essential that the system is installed and maintained in accordance with the conditions set out in this Certificate, and advice on specific construction details is obtained from the Certificate holder.

5 Practicability of installation

The system should only be installed by specialist contractors who have successfully undergone training and registration by the Certificate holder.

6 Strength and stability

6.1 The substrate wall to which the system is to be fixed should be designed and constructed in accordance with the requirements of the relevant national Building Regulations and Standards.

6.2 An assessment of the structural performance for a particular building must be carried out by a qualified structural engineer to confirm that:

- the design of the sub-frame is in accordance with the relevant Codes and Standards, and is such as to limit mid-span deflections to $L/300$ and cantilever deflections to $L/150$. Reference should be made to the manufacturer's literature for the subframe components section properties.
- the supporting substrate wall is capable of withstanding the loads applied to it from the system and resisting the additional loads that may be applied as a result of installing the system
- the proposed system and associated fixing layout provide adequate resistance to wind loads
- an appropriate number of site-specific pull-out tests is conducted on the substrate 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 TR 055 : 2018, using 50% of the mean value of the five smallest measured values at the ultimate load.

6.3 Design wind actions must be calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. Due consideration should be given to higher pressure coefficients applicable to corners of the building, as recommended in this Standard. In accordance with BS EN 1990 : 2002 and its UK National Annex, it is recommended that a partial material factor of 1.5 is used to determine the design wind load to be resisted by the system.

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

6.5 A combination of horizontal and vertical actions must be checked by an appropriately qualified engineer, in accordance with BS EN 1999-1-1 : 2007 and BS EN 1999-1-3 : 2007, and their UK National Annexes, in conjunction with BS EN 1990 : 2002 and BS EN 1991-1-1: 2002, and their UK National Annexes.

6.6 The following tests have been carried out for the dynamic wind load resistance of the system:

- 200 mm wide and 2.4 m long Alucovering panels attached to the horizontal T-rails with 4.8 x 14 mm K9 rivets, one rivet for a fixed connection at one end and the remaining connections being sliding points achieved through aluminium clips with one K9 rivet to allow movement. T-rails fixed at 450 mm centres on L-brackets with TL-rivets (one rivet for sliding connection and two rivets for fixed connection respectively) at 500 mm support centres. L-brackets fixed to the substrate with three self-drilling screws⁽¹⁾ per bracket. A spacing of 8 mm is left between adjacent panels. The system achieved an ultimate wind load resistance of $3.6 \text{ kN}\cdot\text{m}^{-2}$. The design wind load resistance, evaluated by applying a partial factor of 1.5 to the ultimate wind load resistance, was found to be $2.4 \text{ kN}\cdot\text{m}^{-2}$. The Box-rail and U-bracket build-up system has been assessed as capable of achieving the same performance with respect to wind loading
- 450 mm wide and 3.5 m long Alucovering-P panels attached to the horizontal T-rails with 4.8 x 14 mm K9 rivets, two rivets for a fixed connection at one end and the remaining connections being sliding points achieved through aluminium clips with two K9 rivets to allow movement. T-rails fixed at 600 mm centres on L-brackets with TL-rivets (one rivet for sliding connection and two rivets for fixed connection respectively), at 600 mm support centres. L-Brackets fixed to the substrate with self-drilling screws⁽¹⁾. A spacing of 8 mm is left between adjacent panels. The system achieved an ultimate wind load resistance of $4.4 \text{ kN}\cdot\text{m}^{-2}$. The design wind load resistance, evaluated by applying a partial factor of 1.5 to the ultimate wind load resistance, was found to be $2.93 \text{ kN}\cdot\text{m}^{-2}$.

(1) Outside the scope of this Certificate.

Impact loading

6.7 When tested for hard and soft body impact, the systems described in section 6.6 with Alucovering panels achieved adequate resistance. The systems are therefore suitable for use in Categories I to IV as defined in ETAG 034 : 2012, Part 1, Table 4 (reproduced in Table 3 of this Certificate).

Table 3 Definition of Use Categories (reproduced from ETAG 034 : 2012, Part 1, Table 4)

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

7 Behaviour in relation to fire



7.1 The system components have the classifications shown in Table 4 and are not subject to any restrictions on building height or proximity boundaries.

Table 4 System components — classifications

Component	Classification
Anodised aluminium panels, K9 rivets, T-rails and Box-rails, Aluminium Clips, L and U Brackets	A1 ⁽¹⁾
Polyester powder coated panels (various colours)	A2-s1, d0 ⁽²⁾

(1) In accordance with the national Building Regulations.

(2) Report reference RA13-0167 to EN 13501-1 : 2018.

7.2 Cavity barriers should be incorporated behind the cladding as required under the national Building Regulations, for example, by the use of intumescent cavity barriers (outside the scope of this Certificate) or overhanging non-combustible breaks at each floor level, but these 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 cladding system is not airtight or watertight, but intentionally open-jointed, back ventilated and drained.

8.2 The supporting wall must satisfy the requirements of the relevant national Building Regulations and Standards with respect to airtightness and watertightness.

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

8.4 Consideration should be given to providing a vapour permeable membrane to protect the inner wall from precipitation. In such cases, the Certificate holder's advice should be sought.

9 Maintenance



9.1 The panels generally do not need cleaning but, where this is necessary, they may be cleaned using warm water and mild detergents without solvents (eg. detergent for metal components). Brushes must not be used. For the removal of graffiti, persistent stains etc, the Certificate holder's advice should be sought. This is in line with BS 3987 : 1991.

9.2 Checks should be carried out periodically to ensure that ventilation and drainage pathways remain clear; blockages should be cleared promptly.

9.3 Damaged panels should be replaced as soon as is practicable, following the Certificate holder's instructions and observing all necessary Health and Safety precautions.

9.4 Annual maintenance inspections should be carried out to ensure that rainwater goods are complete and in good order, and that flashings and seals are in place and secure. Damaged seals should be replaced and new sealant applied where necessary.

10 Durability



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

10.2 Provided that regular maintenance is carried out as described in section 9 and in accordance with the Certificate holder's instructions, the system can be expected to have a service life in excess of 30 years, when used in normal climatic conditions found in the UK.

10.3 The aluminium support rails will have a lifetime at least commensurate with the panels they are supporting.

10.4 The durability and service life of the panels will depend on the building location and height, façade aspect, intended use of the building and the immediate environmental conditions to which it is exposed.

11 Reuse and recyclability

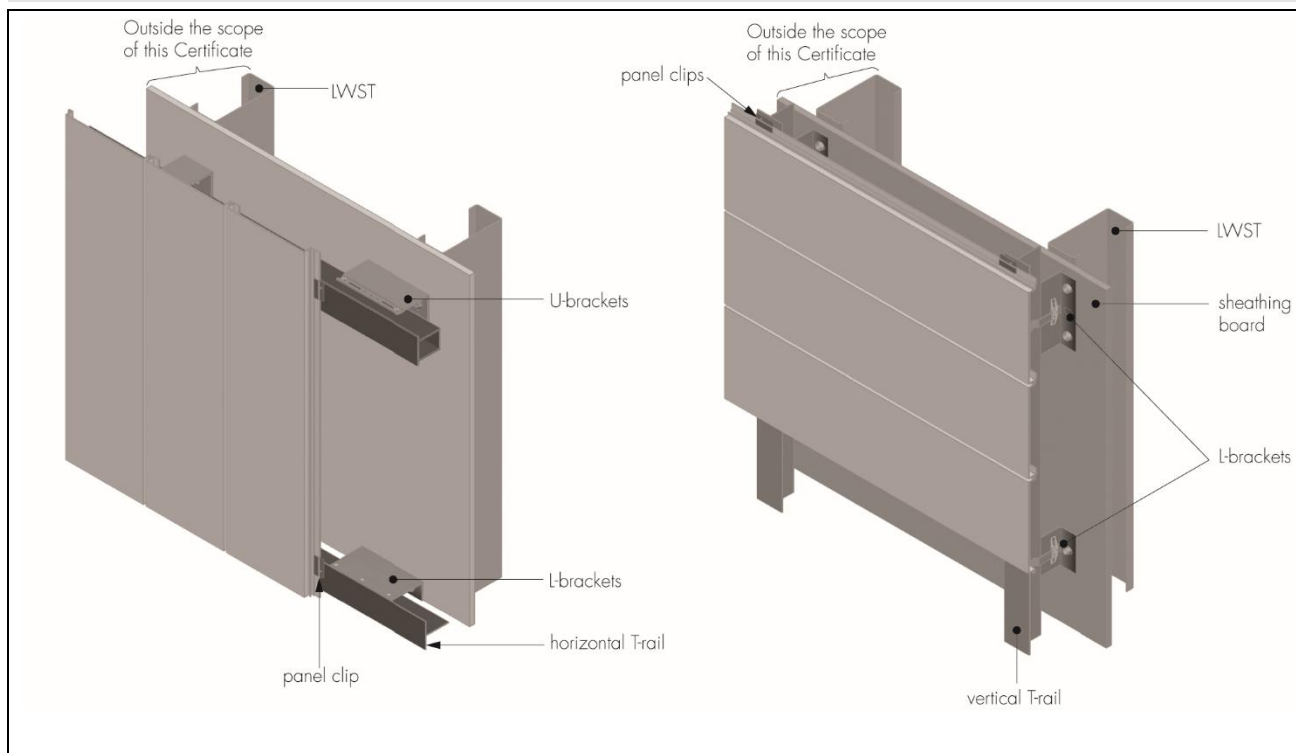
The aluminium panels, rail and bracket components can be recycled.

Installation

12 General

12.1 The Aliva Alucovering Rainscreen Cladding System can be installed vertically or horizontally and must be installed in accordance with the Certificate holder's recommendations, the requirements of this Certificate and the specifications laid down by the consulting engineer. Typical installation details for the system are as shown in Figure 7.

Figure 7 Aliva Alucovering Rainscreen Cladding System



12.2 If significant colour variations between panel batches is likely to be present, it may be necessary to mix the panels from different pallets to obtain a uniformity of shade over the whole façade.

12.3 Due to manufacturing tolerances, some unevenness on the façade surface may occur, but this will not be excessive or obtrusive.

12.4 Thermal expansion effects on the support system should be taken into consideration during the installation of the cladding system. It is recommended that the fixed point rivet is made in the same position for each and every panel to the same vertical profile to make provision for movement in the longitudinal direction.

13 Procedure

13.1 Based on a preliminary survey of the wall and architectural/structural design, a grid layout for the supporting frame is prepared. Accurate grid positioning and installation of the supporting frame is essential.

13.2 The rails are spaced at 450 or 600 mm centres according to the panel type and fixed to the wall brackets using specified rivets. The brackets are fixed to the substrate using suitable fixings, ensuring the alignment is checked regularly.

13.3 Once the brackets are installed, the T-rails (held in place initially by means of spring clips) or box-rails are fixed with TL or TSV rivets respectively. They are lined and levelled, typically using laser equipment, and fastened to the fixed point brackets using TL or TSV rivets (depending on the system type) in the top and bottom holes of the bracket and then fixed to the sliding point with the same type of rivet in vertical slots.

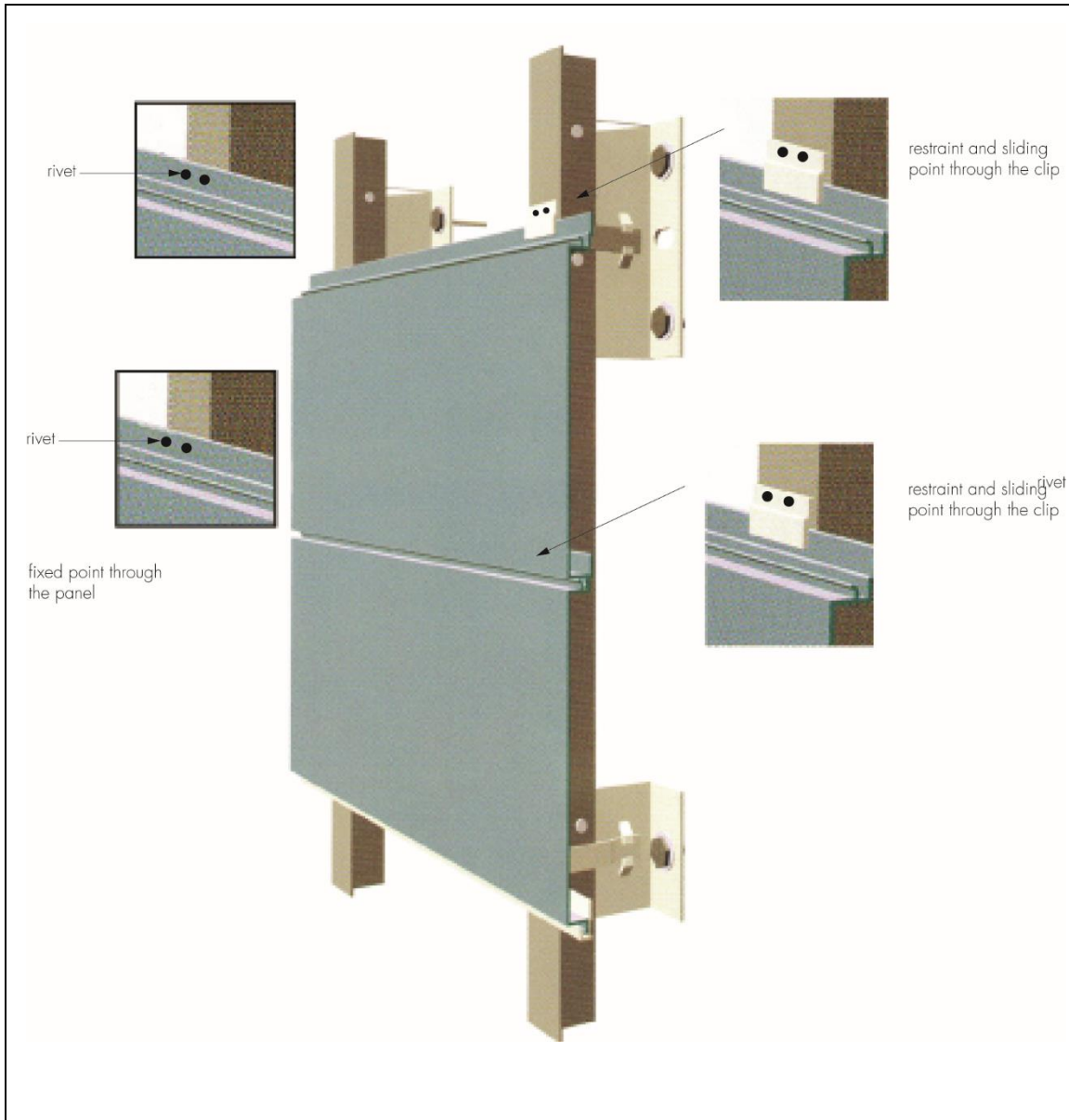
13.4 The first panel is installed by placing the bottom edge of the panel into the internal channel of the base profile (starter rail). The upper edge of the same panel is then fixed directly to the horizontal rail creating a fixed and a sliding connection. A rivet is fixed directly through the upper edge of the panel into the T-rail, to create a fixed point. An aluminium clip which is shaped to fit on the top edge of the panel, is fixed with two rivets passing through the hole of the clip directly into the T-rail (see Figures 1 and 8).

13.5 Subsequent panels are placed one on top of the other by placing the bottom edge into the channel on top of the previous one and repeating the fixing regime with rivets and clips until the top of the façade, a window or movement joint is reached.

13.6 Adjacent cladding panels are fitted, ensuring a 10 mm gap between butt edges. Expansion joints in the substrate must always coincide with the vertical joints in the façade system using two vertical profiles. Similarly, panels must not cover expansion joints in the building or horizontal joints in the vertical aluminium frame.

13.7 For more rapid and secure installation it is recommended to 'pinch' the Alucovering joint profile with pliers before snapping it into the slotted channel. Each time a new section of cladding is started, and where a joint profile or an opening is present, it is necessary to install a starter profile.

Figure 8 Panel installations



Expansion joints

13.8 Joints between the slotted sides of the panels are semi-closed. Expansion joints in the substrate must always coincide with the vertical joints in the façade system using two vertical profiles. Similarly, panels must not cover any expansion joints in the building nor horizontal joints in the vertical sub-frame.

13.9 It is recommended to allow a gap of 8 to 10 mm between ends of adjacent horizontal rails and 6 to 8 mm between ends of adjacent vertical rails for thermal expansion, see Figure 9.

13.10 In the event that it is necessary to cut the Alucovering panels on site, it is advisable to use suitable metal-cutting equipment and remove any swarf. Once the ends are cut, they should be sealed to avoid corrosion.

13.11 For typical system installations details, see Figures 9 to 12.

Figure 9 Expansion joints

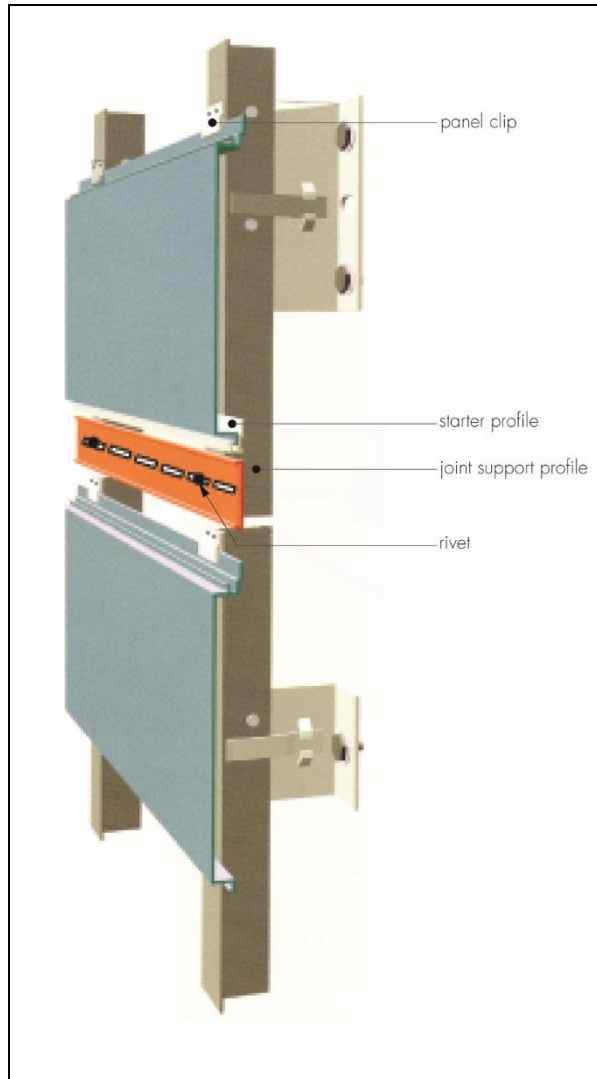


Figure 10 Typical window section details

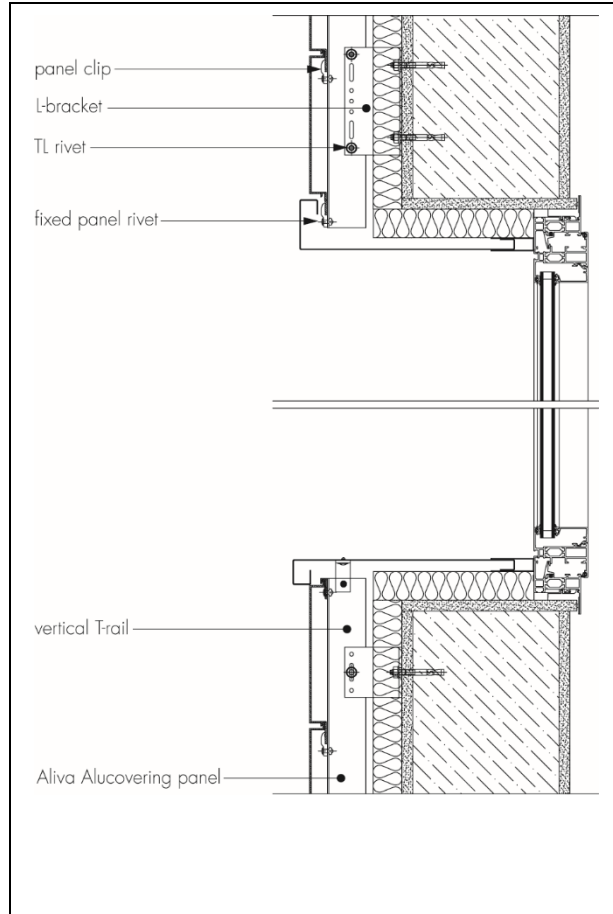


Figure 11 Typical parapet roof section details

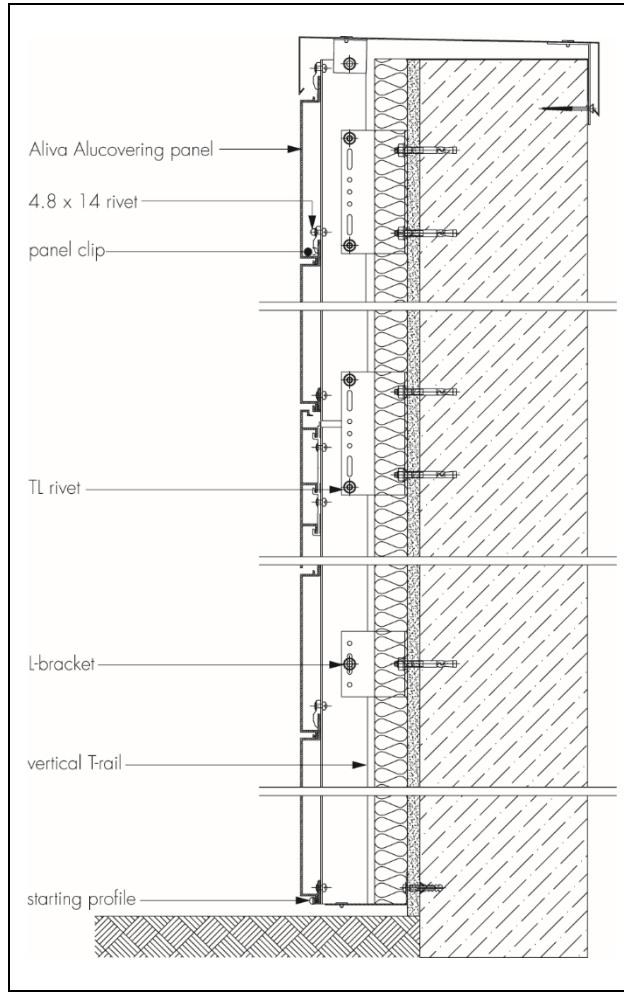
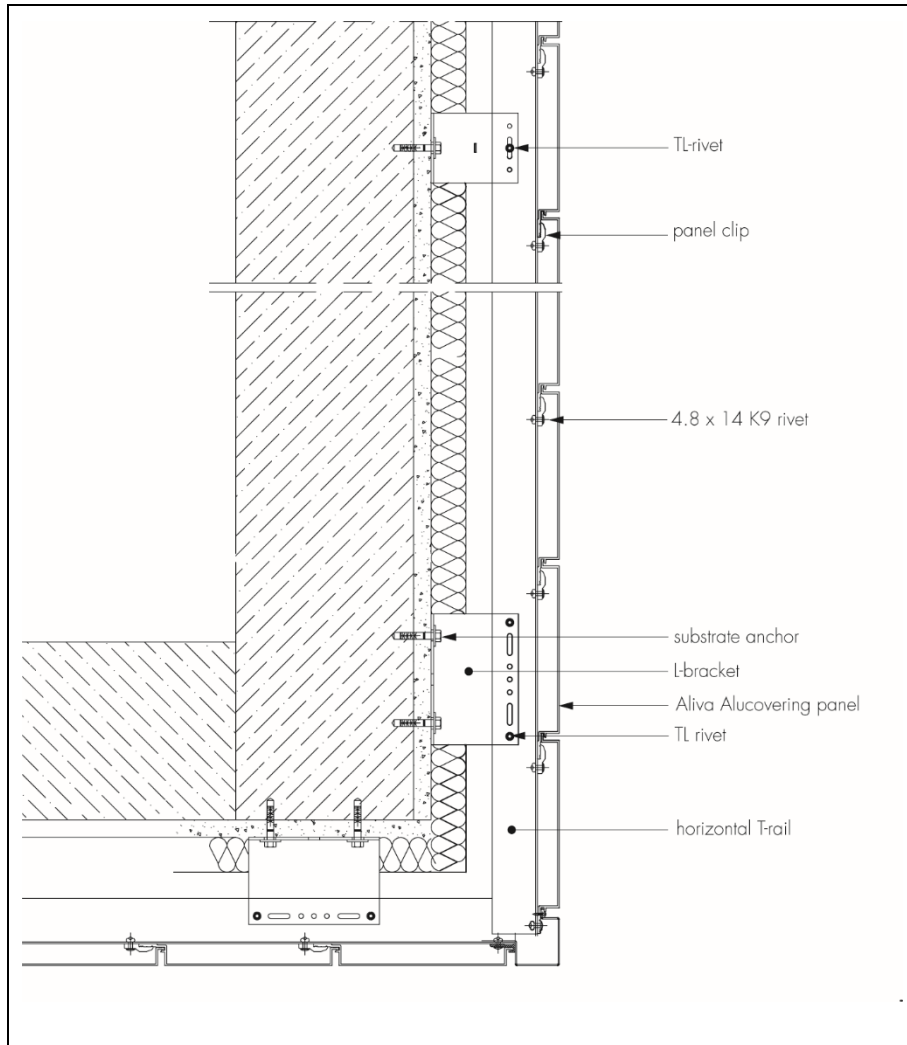


Figure 12 Typical corner section details



Technical Investigations

14 Tests

Tests were carried out and the results assessed to determine:

- wind load resistance
- watertightness
- impact resistance.

15 Investigations

15.1 From test data, an assessment was made of the claddings for:

- system serviceability
- system safety
- durability.

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.

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