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Agrément Certificate
10/4746
Product Sheet 1

MULTIPANEL CLADDING PANELS

ALUPANEL XT CLADDING PANEL

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Alupanel XT Cladding Panel, a composite panel of aluminium and polyethylene, used to provide a decorative and protective façade over the external walls of buildings.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Practicability of installation — the panels are suitable for installation by cladding contractors providing they have undergone suitable training (see section 4).

Strength and stability — the panels can resist the surface loadings normally encountered in the UK (see section 5).

Behaviour in relation to fire — the product has a reaction-to-fire classification of Class 0 in accordance with the Building Regulations in England and Wales and a 'low risk' material in Scotland (see section 6).

Air and water penetration — the cladding restricts the passage of water entering the cavity (see section 7).

Maintenance — damaged panels may easily be replaced individually (see section 8).

Durability — the panels have acceptable durability and can be expected to have a service life of in excess of 30 years (see section 9).



The BBA has awarded this Agrément 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: 19 April 2010

Handwritten signature of Brian Chamberlain in black ink.

Brian Chamberlain

Head of Approvals — Engineering

Handwritten signature of Greg Cooper in black ink.

Greg Cooper

Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, the Alupanel XT Cladding Panel, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:



The Building Regulations 2000 (as amended) (England and Wales)

Requirement:	A1	Loading
Comment:		The panels are acceptable for use as set out in sections 3.4 and 5.1 to 5.10 of this Certificate.
Requirement:	B2(1)	Internal fire spread (linings)
Comment:		The panels meet the Class 0 requirements. See sections 6.1 to 6.6 of this Certificate
Requirement:	B4(1)	External fire spread
Comment:		The panels meet the Class 0 requirements. See sections 6.1 to 6.6 of this Certificate.
Requirement:	C2(b)(c)	Resistance to moisture
Comment:		The cladding will meet this requirement. See sections 7.1 and 7.4 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The panels are acceptable. See sections 9.1 and 9.2 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		This product can contribute to a construction satisfying this Regulation. See sections 8.1 to 8.3, 9.1 and 9.2 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building Standards – construction
Standard:	1.1(a)(b)	Structure
Comment:		The panels are acceptable, with reference to clauses 1.1.1 ⁽¹⁾⁽²⁾ , 1.1.2 ⁽¹⁾⁽²⁾ and 1.1.3 ⁽¹⁾⁽²⁾ . See sections 3.4 and 5.1 to 5.10 of his Certificate.
Standard:	2.4	Cavities
Comment:		The panels when used in conjunction with fire-resistant materials, can meet 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 sections 3.4 and 6.6 of this Certificate.
Standard:	2.5	Internal linings
Comment:		The panels can contribute to a construction satisfying this Standard, with reference to clauses 2.5.1 ⁽¹⁾⁽²⁾ . See sections 6.1 to 6.6 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The panels can contribute to a construction satisfying this Standard, with reference to clauses 2.6.4 ⁽¹⁾⁽²⁾ , 2.6.5 ⁽¹⁾ and 2.6.6 ⁽²⁾ . See sections 6.1 to 6.6 of this Certificate.
Standard:	2.7	Spread on external walls
Comment:		The panels can contribute to satisfying this Standard, with reference to clause 2.7.1 ⁽¹⁾⁽²⁾ . See sections 6.1 and 6.5 of this Certificate.
Standard:	3.10	Precipitation
Comment:		This panels will contribute to meeting this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ , 3.10.3 ⁽¹⁾⁽²⁾ , 3.10.5 ⁽¹⁾⁽²⁾ and 3.10.6 ⁽¹⁾⁽²⁾ . See sections 7.1 to 7.4 of this Certificate. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The panels are acceptable. See sections 9.1 and 9.2 and the <i>Installation</i> part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The panels are acceptable. See sections 8.1 to 8.3 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Comment:		The panels can contribute to satisfying this Regulation. See sections 7.1 to 7.4 of this Certificate.
Regulation:	D1	Stability
Comment:		The panels are acceptable as set out in sections 3.4 and 5.1 to 5.10 of this Certificate.
Regulation:	E3	Internal fire spread – Linings
Comment:		The panels are judged to meet the Class 0 requirements. See sections 6.1 to 6.6 of this Certificate.
Regulation:	E5	External fire spread
Comment:		The panels are judged to meet the Class 0 requirements. See sections 6.1 to 6.6 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 *Description* (1.4), 2 *Delivery, storage and site handling* (2.4) and 8 *Maintenance* (8.3) of this Certificate.

Non-regulatory Information

NHBC Standards 2008

NHBC accepts the use of the Alupanel XT Cladding Panel, when installed and used in accordance with this Certificate, in relation to *NHBC Standards, Chapter 6.9 Curtain walling and cladding*.

General

This Certificate relates to the Alupanel XT Cladding Panel comprising an aluminium and polyethylene composite material fixed to a sub-frame to provide a decorative and protective cladding over the external walls of the buildings.

The sub-frame and its attachment to the substrate wall are outside the scope of this Certificate as are other miscellaneous construction details.

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

Technical Specification

1 Description

1.1 Alupanel XT Cladding Panels (see Figure 1) are a composite of a low-density polyethylene (LDPE) core bonded either side with aluminium sheets:

- LDPE core — extruded and available in thicknesses from 2 mm to 5 mm
- aluminium sheet — 0.5 mm thick, aluminium alloy grade 3103 H16 (United Kingdom designation) equivalent to EN AW-3003 H16 (European designation).

1.2 The panels are available in standard sizes⁽¹⁾ of:

- width (m) 1, 1.22, 1.25 and 1.5
- length (m) 2.4 to 8
- overall thickness (mm) 3, 4 and 6
- weight ($\text{kg}\cdot\text{m}^{-2}$) 4.5, 5.5 and 7.3

(1) Other sizes are available to special order.

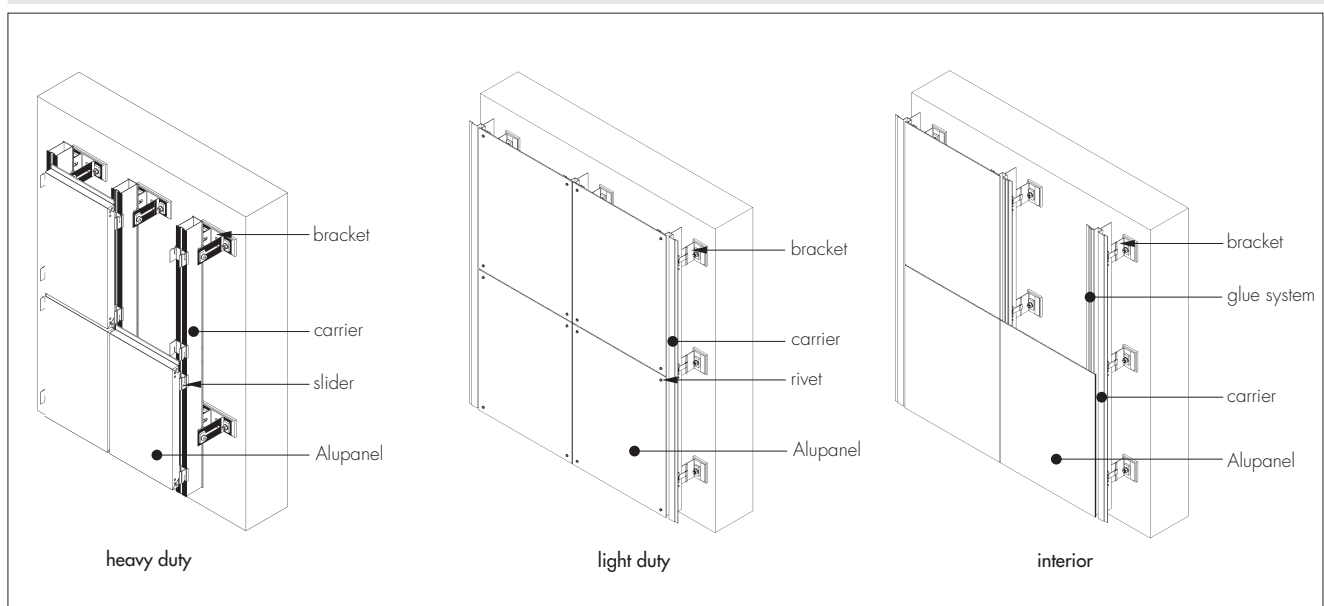
1.3 The outward facing aluminium sheet is coated with a 30 micron layer of polyvinylidene difluoride (PVDF) paint available in various colours. The reverse side is covered with a polyethylene (PE) primer protective finish. The products are also available in a fire-retardant grade (FR).

1.4 The panels can be fabricated into shapes and profiles when required.

1.5 Depending on the application, there are three fixing methods [K2 system (heavy duty), L2 system (light duty) and interior (adhesive)], but are outside the scope of this Certificate.

1.6 Quality control is exercised over the raw materials, during production and on the final product.

Figure 1 Typical panels



2 Delivery, storage and handling

2.1 The panels are delivered on pallets. The pallets bear product details such as type, size, quantity, identification code, manufacturing references and colour.

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

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

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

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Alupanel XT Cladding Panel.


Design Considerations

3 General

3.1 The Alupanel XT Cladding Panel is suitable for conversion into factory-produced cladding cassettes, or may be used as flat sheet, for non-loadbearing external cladding or internal lining fixed to a substructure. The geometry of the cassettes, and the type and frequency of the fixings used should be in accordance with the requirements of BS 8200 : 1985. The cassette designs are outside the scope of this Certificate.

3.2 The product can be worked by conventional techniques in accordance with the Certificate holder's instructions. These include sawing and cutting, routing, slotting, folding, drilling, bending, clamping and bolting, shearing, hot-air welding 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.

3.3 The product can be incorporated in back-ventilated and drained cladding systems. The cavity behind the cladding should be as wide as is possible (see section 7). The ventilation openings should be suitably protected, or baffled, to prevent the ingress of birds, vermin and rain.

 3.4 The 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 Building Regulations and Standards.

3.5 The wall to which the cladding is fixed should be watertight and resistant to the transmission of heat and sound.

3.6 The insulation behind the cladding should be suitably fixed to the supporting wall, and protected, to resist the forces of wind suction. Insulation should be of a rigid type (eg boards or bats). The ventilation pathway behind the cladding must not be allowed to become blocked nor the insulation dislodged where it may be vulnerable to wetting.

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

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

4 Practicability of installation

The products are suitable for installation by cladding contractors provided they have undergone suitable training by the Certificate holder (see section 10). The Certificate holder can provide advice on installation if required.

5 Strength and stability

Wind loading

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

Table 2 Panel properties⁽¹⁾

Panel thickness (mm)	Section modulus Z (cm ⁻³ .m ⁻¹)	Flexural rigidity EI (Nm ² .m ⁻¹)
3	1.25	108.6
4	1.75	212.8
6	2.75	525.5

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

5.2 The minimum proof stress 0.2% should be taken as 150 N·mm⁻².

5.3 Rivets, self-tapping screws or glue should be used to attach the panels to the support frame (see Figure 1). The design should ensure adequate capacity against wind pressure/ suction. To allow for panel expansion, fixings in clearance holes should be provided as required. The fixings are outside the scope of this Certificate.

5.4 The maximum allowable wind pressure/suction will be the lesser value obtained by considering the panels and fixings separately.

5.5 When calculating wind loads, higher pressure coefficients applicable to corners of the building should be used.

5.6 Design of the sub-frame should be such as to limit mid-span deflections to $L/200$ and cantilever deflections to $L/150$.

5.7 In the design of the sub-frame attachment to the substrate wall, it should be ensured that the pull-out capacity of the fixings is adequate.


5.8 A suitably qualified engineer must check the design and installation of the cladding system.

5.9 The supporting wall must be able to take the full wind, as well as any racking, loads on its own. No contribution from the cladding may be assumed in this regard.

5.10 Wind loads should be calculated in accordance with BS EN 1991-1-4 : 2005.

5.11 As the products are susceptible to damage from hard body impacts, it is recommended that their use is limited to locations where there is little possibility of such impacts. That is, at ground level in private areas where there is some incentive to exercise care, and at higher levels in public areas, as described in BS 8200 : 1985, Table 2, categories C to F.

6 Behaviour in relation to fire

 6.1 When tested to BS 476-6 : 1989, Alupanel XT achieved a fire propagation index (I) of 1.87, with sub-indices i_2 of 0.64 and i_3 of 1.23.

6.2 When tested to BS 476-7 : 1997, the product achieved a Class 1 surface spread of flame.

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

England and Wales — Approved Document B

Scotland — Annex 2C⁽¹⁾ and Annex 2E⁽²⁾

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

Northern Ireland — Technical Booklet E.

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

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

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

(1) Technical Handbook (Domestic).


(2) Technical Handbook (Non-Domestic).


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

6.5 For resistance to fire, the performance of a wall incorporating the product, can only be determined by tests from a suitably accredited laboratory, and is not covered by this Certificate.

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

7 Air and water penetration

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

 7.2 The supporting wall must be watertight and reasonably airtight.

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

7.4 The air space between the back of the panels and the supporting wall or insulation should be as wide as is possible and allow for conventional building tolerances. Guidance on recommended cavity widths is given in *NHBC Standards 2008*, Chapter 6.9.

8 Maintenance



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

8.2 Annual maintenance inspections should be carried out to ensure that rainware is complete and in good order and that such features as tiles, flashings and seals are in place and fixings are secure.

8.3 Damaged panels should be replaced as soon as is practicable; work carried out should follow the Certificate holder's instructions and all necessary Health and Safety regulations should be observed.

9 Durability



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

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

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

Installation

10 General

10.1 Alupanel XT Cladding Panels must be installed in accordance with the Certificate holder's recommendations, the requirements of this Certificate and specifications laid down by the consulting engineer. The fixing and support systems are outside the scope of this Certificate.

10.2 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.

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

11 Procedure

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

11.2 The aluminium sub-frame is attached to the substrate wall via cleats.

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

11.4 For a cassette system (see Figure 1):

- the sliding pinned brackets are screwed to the vertical support rails at predetermined positions coinciding with the centre lines of the panel T-slots. To reduce installation time, this operation is normally performed in the shop rather than on site
- the panel is hung from the top pinned brackets. After minor adjustments, the pinned brackets are tightened against the vertical support rail using socket screws
- to lock the panel in position, the bottom pinned brackets are similarly adjusted and screwed tight against the vertical support rail when at the bottom end of the panel T-slot
- to achieve the required clearances, intermediate pinned brackets (if used) may need to be repositioned.

Technical investigations

12 Tests

Tests were carried out to determine:

- effects of weathering
- resistance to impact
- adhesion of paint coating
- resistance to abrasion
- inter-layer adhesion
- resistance to marking and staining
- resistance to corrosion (salt spray)
- resistance to scratching.

13 Investigation

13.1 An examination was made of external test reports relating to fire testing to BS 476-6 : 1989 and BS 476-7 : 1997, and to flexural properties.

13.2 The manufacturing process and quality control procedures were examined and details were obtained of the quality and composition of the materials used.

13.3 Visit was made to an existing site.

Bibliography

BS 476-6 : 1989 *Fire tests on building materials and structures — Method of test for fire propagation for products*

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

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

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

14 Conditions

14.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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 and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

14.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

14.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date 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. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.