

FunderMax GmbH

Klagenfurter Strasse 87–89
9300 St Veit an der Glan
Austria

Tel: 00 435 9494 0 Fax: 00 435 9494 4200
e-mail: office@fundermax.at
website: www.fundermax.at



Agrément Certificate
12/4937
Product Sheet 1

FUNDERMAX CLADDING PANELS

MAX EXTERIOR CLADDING PANELS

This Agrément Certificate Product Sheet⁽¹⁾ relates to Max Exterior Cladding Panels, high pressure laminated panels fixed onto a timber or aluminium support frame for use in back ventilated and drained cladding systems of new and existing buildings.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

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



KEY FACTORS ASSESSED

Strength and stability — the panels can resist the surface loadings normally encountered in the UK (see section 6).

Behaviour in relation to fire — the panels has a reaction-to-fire classification of B-s2, d0 in accordance with BS EN 13501-1 : 2007 (see section 7).

Air and water penetration — a cladding system constructed using the panels will restrict the passage of water into the cavity and to the substrate (see section 8).

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

The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Brian Chamberlain

Head of Approvals — Engineering

Claire Curtis-Thomas

Chief Executive

Date of Second issue: 27 January 2015

Originally certificated on 18 September 2012

The BBA is a UKAS accredited certification body — Number 1113. 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.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

tel: 01923 665300
fax: 01923 665301
clientservices@bba.star.co.uk
www.bbacerts.co.uk

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Regulations

In the opinion of the BBA, Max Exterior Cladding Panels, 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 product is acceptable for use as set out in sections 4.2 and 6 of this Certificate.
Requirement: B4(1)	External fire spread
Comment:	The product is judged to meet Class '0' requirements. See section 7 of this Certificate.
Requirement: C2(b)	Resistance to moisture
Comment:	Cladding systems incorporating the product are not watertight but will resist the passage of rainwater to the supporting structure. See section 8 of this Certificate.
Regulation: 7	Materials and workmanship
Comment:	The product is acceptable. See sections 10.1 and 10.2 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 use of the product satisfies the requirements of this Regulation. See sections 9, 10.1 and 10.2 and the <i>Installation</i> part of this Certificate.
Regulation: 9	Building standards applicable to construction
Standard: 1.1(a)(b)	Structure
Comment:	The product is acceptable, in accordance with clause 1.1.1 ⁽¹⁾⁽²⁾ of this Standard. See sections 4.2 and 6 of this 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⁾ , 2.4.7 ⁽¹⁾⁽²⁾ and 2.4.9 ⁽¹⁾⁽²⁾ . See sections 4.2 and 7.4 of this Certificate.
Standard: 2.6	Spread to neighbouring buildings
Comment:	The product can contribute to satisfying clause 2.6.4 ⁽¹⁾⁽²⁾ , 2.6.5 ⁽¹⁾ , 2.6.6 ⁽¹⁾⁽²⁾ and 2.6.7 ⁽²⁾ of this Standard. See section 7 of this Certificate.
Standard: 2.7	Spread on external walls
Comment:	The product can contribute to satisfying clause 2.7.1 ⁽¹⁾⁽²⁾ of this Standard. See section 7 of this Certificate.
Standard: 3.10	Precipitation
Comment:	Cladding systems incorporating the product are not watertight but will resist the passage of rainwater to the supporting structure, in accordance with clauses 3.10.1 ⁽¹⁾⁽²⁾ to 3.10.3 ⁽¹⁾⁽²⁾ , 3.10.5 ⁽¹⁾⁽²⁾ and 3.10.6 ⁽¹⁾⁽²⁾ of this Standard. See section 8 of this Certificate.
Standard: 7.1(a)(b)	Statement of sustainability
Comment:	The product 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. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012

Regulation: 23(a)(i)(iii)	Fitness of materials and workmanship
Comment:	The product is acceptable. See sections 10.1 and 10.2 and the <i>Installation</i> part of this Certificate.
Regulation: 28	Resistance to moisture and weather
Comment:	Cladding systems incorporating the product are not watertight but will resist the passage of rainwater to the supporting structure. See section 8 of this Certificate.
Regulation: 30	Stability
Comment:	The product is acceptable as set out in sections 4.2 and 6 of this Certificate.
Regulation: 36(a)	External fire spread
Comment:	The product is judged to meet Class '0' requirements. See section 7 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 section: 3 *Delivery and site handling* (3.3) of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of Max Exterior Cladding Panels, provided they are installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards, Part 6 Superstructure (excluding roofs)*, Chapter 6.9 *Curtain walling and cladding*.

CE marking

The certificate holder has taken the responsibility of CE marking the products in accordance with harmonised European Standard BS EN 438-7 : 2005. An asterisk (*) appearing in this certificate indicates that data shown is given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 Max Exterior Cladding Panels are high pressure laminated panels composed of cellulose fibres impregnated with synthetic resin and are manufactured in 80 different colours to suit architectural requirements. The panels have a mean dry density of $1400 \text{ kg}\cdot\text{m}^{-3}$ and a mean water absorption value of less than 2%, in accordance with BS EN 438-2 : 2005.

1.2 The panels are manufactured to the characteristics shown in Table 1.

Table 1 Characteristics

Panel thickness (mm)	Panel sizes ⁽³⁾ (mm)
6 ⁽¹⁾ , 8 ⁽²⁾ and 10 ⁽²⁾	2140 x 1060
	2800 x 1300
	4100 x 1300
	2800 x 1850
	4100 x 1850

(1) Tolerance up to ± 0.4 mm.

(2) Tolerance up to ± 0.5 mm.

(3) Tolerance -0 mm/ $+10$ mm.

1.3 Fixings used to attach the panels to the support frame depend on the type of framework used. Rivets are used for fixing to an aluminium support frame, and screws are used for fixing to a timber support frame. Required specifications for each type of fixing are given in Table 2. Details of fixings are given in Figure 1.

Table 2 Specification for fixings

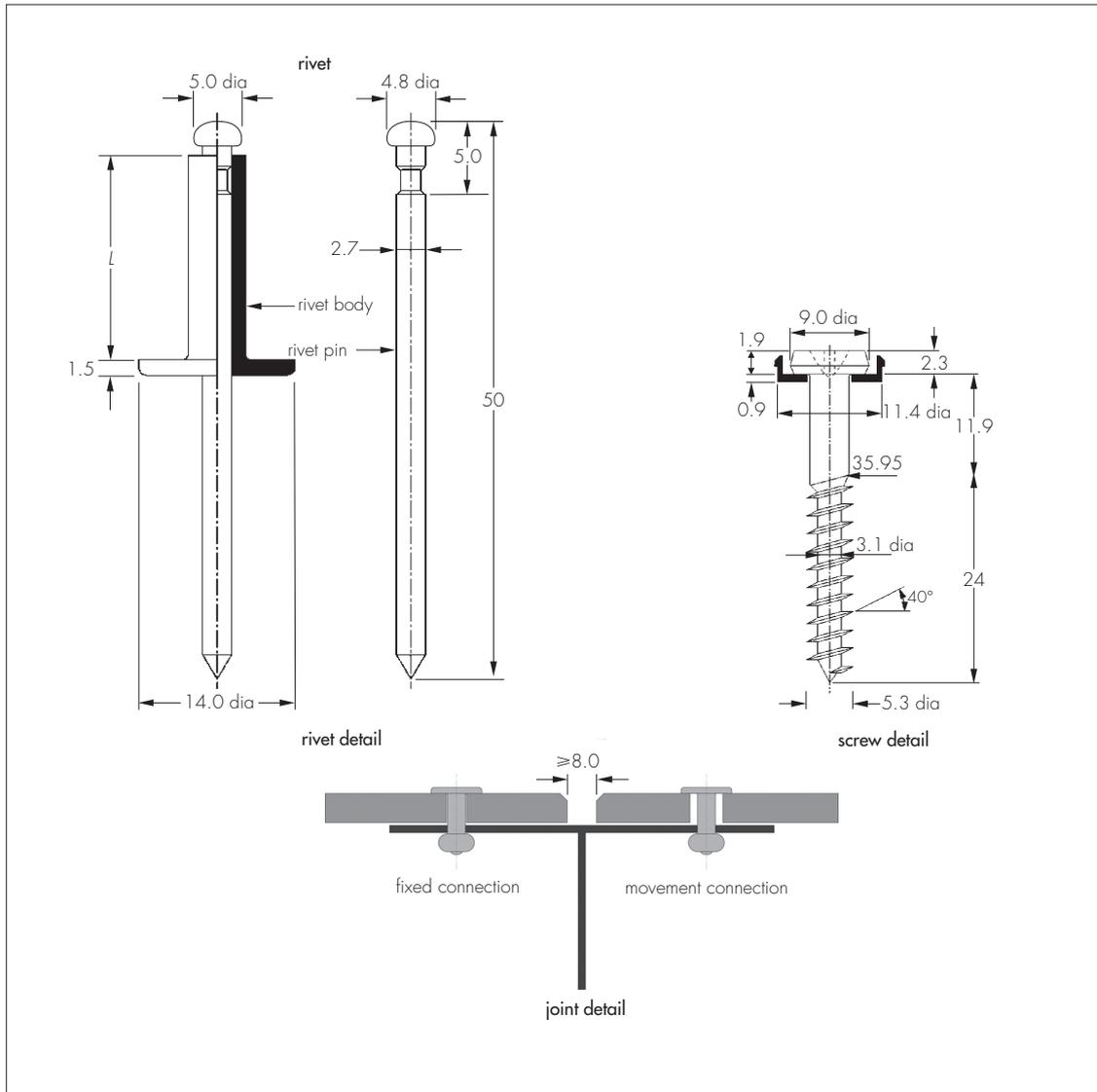
Characteristic	Minimum requirement	
	Aluminium support frame (rivet fixing)	Timber support frame (screw fixing)
Thickness of panel (mm)	Length (mm) ⁽¹⁾	Length (mm) ⁽¹⁾
6	16	35.9
8	18	35.9
10	20	35.9
Diameter (mm)	5	5.3
Panel hole diameter (mm)	8.5 ⁽²⁾ (movement connection) 5.1 (fixed connection)	8.0 (movement connection) 6.0 (fixed connection)
Aluminium rail hole diameter (mm)	5.1	—
Allowable shear load (N)	750	400
Snap load (kN)	<5.6	—
Rivet sleeve material	Al Mg 3 grade 3.3535 to DIN EN 755-2 : 2013	—
Shaft material	Steel grade 1.4541 to DIN 17440 : 2001	Stainless steel grade 1.4401 to DIN 17440 : 2001

(1) As shown in Figure 1.

(2) Or as required.

Note: For details of suppliers of suitable fixings, reference should be made to the Certificate holder's current literature.

Figure 1 Fixing detail (all dimensions in mm)



1.4 The support frame, its fixing to the substrate wall and other miscellaneous construction details are beyond the scope of this Certificate.

1.5 The panels characteristic and declared performance are given in Table 3 (checked by testing in accordance to BS EN 438-6 : 2005 and BS EN 438-7 : 2005).

Table 3 Panel characteristics and declared performance

Property	Min value ⁽¹⁾ required	Declared Performance
Tensile strength (MPa)	> 60	> 78 ⁽²⁾
Flexural strength (MPa)	> 80	> 90*
Flexural modulus (MPa)	> 9000	> 9000*
Resistance to wet conditions	Increase in mass < 4% Appearance	PASS*
Dimensional stability at elevated temperature (%)	Longitudinal Max < 0.30 Transversal Max < 0.60	≤ 0.3 ⁽²⁾ ≤ 0.5 ⁽²⁾
Shatter resistance	Drop height 1800	PASS*
Density (kg.m ⁻³)	> 1350	> 1400*
Resistance to fixing (6 mm) (N)	—	> 2000*
Release of formaldehyde	E1 or E2	E1*
Durability immersion in boiling water	—	PASS*

(1) Thickness of the panel are 6 mm, 8 mm, 10 mm.

(2) These values are not declared in the Declaration of Performance.

2 Manufacture

2.1 The panels are primarily manufactured from wood by-products through a high-pressure lamination process using synthetics resin.

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 system of FunderMax GmbH has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 and/or BS EN ISO 14001 : 2004 by Quality Austria (Certificate 00001/0).

3 Delivery and site handling

3.1 Panels are delivered to site polythene-wrapped, covered and fully supported and banded on wooden pallets. Each pallet bears a label showing product details such as type, size, quantity, identification code, manufacturing references and colour.

3.2 Panels should be stored flat and level, clear of the ground and under cover, to prevent distortion.

3.3 During handling, care should be taken to avoid damage to the surface or edges. Panels should be lifted, rather than slid, across other sheets. Operatives should wear suitable protective clothing and all Health and Safety regulations should be observed.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Max Exterior Cladding Panels.

Design Considerations

4 General

4.1 Max Exterior Cladding Panels are intended for use in back ventilated and drained systems and require a minimum 38 mm wide air space behind the back face, together with a minimum ventilation area of 100 cm² per metre run of cladding. Ventilation openings should be suitably protected, or baffled, to prevent the ingress of birds, vermin and rain.



4.2 The wall and the support frame to which the panels are to be fixed should be structurally sound and watertight and constructed in accordance with the requirements of the relevant national Building Regulations and Standards.

4.3 Insulation behind the panels needs to be suitably fixed to the inner leaf to resist wind suction. Insulation should be of a rigid type (eg boards or batts). The ventilation pathway behind the cladding must not be allowed to become blocked nor the insulation dislodged where it may be vulnerable to wetting.

4.4 The minimum joint gap to be provided between panels for thermal expansion is 8 mm. The cladding panels must not straddle this gap. Joint gaps between panels may be varied provided adequate allowance is made for expansion.

4.5 The design of a cladding system incorporating the panels should ensure that water is prevented from reaching any part of the wall likely to be damaged by moisture. In exposed conditions, with frequent wind-driven rain, consideration should be given to providing a vapour permeable membrane to protect the inner wall or insulation. In such cases, the advice of the Certificate holder should be sought.

4.6 All design aspects of the installation should be checked by a suitably qualified and experienced person. Specific construction details, eg flue penetrations, can be obtained from the Certificate holder.

5 Practicability of installation

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

6 Strength and stability

Wind loading



6.1 For design purposes, the panels should be taken as having mechanical properties of:

- allowable bending stress:
 - longitudinal 25 (N·mm⁻²)
 - transverse 18 (N·mm⁻²).

- elastic modulus:
 - longitudinal 12000 (N·mm⁻²)
 - transverse 9000 (N·mm⁻²).

6.2 For design purposes, the allowable pull-through loads for the fixings should be taken from Table 4.

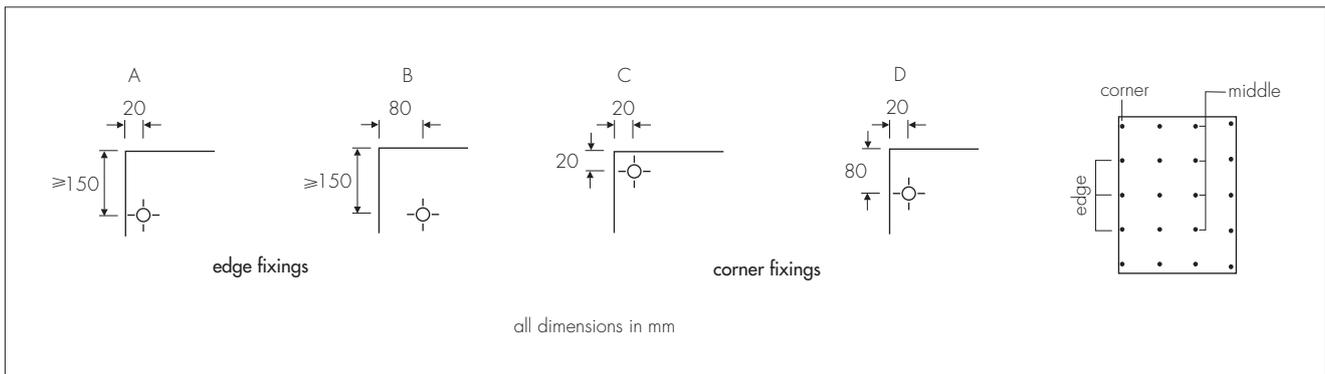
Table 4 Fixings – allowable pull-through loads⁽¹⁾ (N)

Panel thickness (mm)	Fixing centres (mm)	Middle fixings		Edge fixings (see Figure 2)				Corner fixings (see Figure 2)			
				A		B		C		D	
		rivet	screw	rivet	screw	rivet	screw	rivet	screw	rivet	screw
6	200	470	370	240	240	340	340	143	143	191	191
	400	400	370	200	200	300	300	121	121	162	162
	600	370	370	185	185	250	250	100	100	148	130
8	200	600 ⁽²⁾	370	315	315	475	370	190	190	252	252
	400	600 ⁽²⁾	370	280	280	420	370	167	167	223	223
	600	500	370	270	270	360	360	146	146	216	189
	700	450	370	225	225	335	335	135	135	180	180
10	200	600 ⁽²⁾	370	220	370	600 ⁽²⁾	370	254	254	338	338
	400	600 ⁽²⁾	370	385	370	600 ⁽²⁾	370	232	232	310	310
	600	600 ⁽²⁾	370	390	370	510 ⁽²⁾	370	211	211	310	273
	800	600 ⁽²⁾	370	315	315	470	370	189	189	252	252

(1) For fixing arrangements other than those shown, linear interpolation may be used.

(2) Applicable to aluminium support rail with a thickness of 2 mm only. For a rail thickness of 1.5 mm, the allowable pull-out load should be taken as 500 N.

Figure 2 Edge distances



6.3 A suitably qualified and experienced individual must check the design and installation of the cladding system.

6.4 The maximum allowable wind pressure should be the lesser of the values obtained by considering the loading on the panels and the fixings separately (see sections 6.1 and 6.2 of this Certificate).

6.5 The sub-frame and the support rails should be designed so as to limit mid-span deflections to $L/200$ and cantilever deflections to $L/150$.

6.6 As the cladding is open-jointed, the supporting wall must be able to take the full wind loads, as well as any racking loads, on its own. The cladding system does not contribute in this respect.

6.7 Wind loads should be calculated in accordance with BS EN 1991-1-4 : 2005. Due consideration should be given to higher pressure coefficient applicable to corners as recommended in this Standard.

Impact loading

6.8 The product is susceptible to damage from hard body impacts. Although resistance to impact is a function of the panel thickness, as well as the support framing, it is recommended that use of the product is restricted to locations where there is some incentive to exercise care and little chance of hard body impacts, as detailed under categories I, II, III and IV as defined in Table 4 of ETAG 034 : 2012 (an abstract of which has been reproduced as shown in Table 5).

Table 5 Definition of all categories from ETAG 034, 6.4.4, Table 4

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 In relation to reaction to fire, the cladding panel is classified as Bs2, d0 in accordance with BS EN 13501-1 : 2007*.

7.2 For reaction to fire, a cladding system incorporating the product may be regarded as having a Class '0' surface or as being a 'low risk' in Scotland as defined in the national Building Regulations:

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.

7.3 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.

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

8 Air and water penetration



8.1 The panel can be incorporated in an open-jointed, back-ventilated and drained cladding system.

8.2 The inner wall supporting the cladding must be watertight, but need not be airtight.

8.3 Provided that all joints are adequately baffled and the specified minimum air gap (ie 38 mm) is maintained between the back face of the panels and the substrate wall, or insulation, 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.

8.4 To minimise water penetration and the risk of damage to the inner wall, the recommendations, set out in section 4.5 of this Certificate, should be followed.

8.5 The joint gaps between panels should, as far as possible, coincide with the centre lines of the support frame members. This helps prevent water ingress into the inner leaf or insulation.

9 Maintenance and repair



9.1 The panels are generally self-cleaning. However, for normal soiling, the surface may be cleaned using a hot water/household detergent mixture, applied with a suitable cleaning pad or sponge. For more difficult chemical soiling, the certificate holder's specialist advice should be sought.

9.2 Annual maintenance inspections should be carried out to ensure that rainware is complete and in good order and that flashings, seals and fastenings are in place and secure.

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.

10 Durability



10.1 The durability and service life of the panel will depend upon the building location, façade aspect, immediate environment, intended use of the building and general condition of the system components.

10.2 Providing regular maintenance is carried out, as described in section 9 and in accordance with the Certificate holder's instructions, the product should have an ultimate service life in excess of 30 years.

10.3 In general, any colour change will be slight and uniform on any one elevation, and the product will have a decorative life of a least 15 years in heavily polluted areas and at least 20 years in other areas. A lower decorative life for dark colours is likely in exposed conditions.

11 Reuse and recyclability

The cellulose fibres impregnated with synthetic resin can be recycled thermally by incineration in appropriate plants.

Installation

12 General

12.1 Max Exterior Cladding Panels must be installed in accordance with the Certificate holder's recommendations, the requirements of this Certificate and the specification laid down by the consulting engineer.

12.2 Technical advice should be sought from the Certificate holder at the design stage and at the commencement of the installation.

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

13 Procedure

13.1 Based on the design, the grid layout is prepared and the support frame installed accordingly (not covered by this Certificate).

13.2 To protect the inner wall or insulation, a vapour permeable membrane may be required⁽¹⁾ (see section 4.5) of this Certificate.

(1) Outside the scope of this Certificate.

13.3 The cladding panels should be fixed to the support frame using the appropriate fasteners as specified in section 1.3 of this Certificate.

13.4 Working from the bottom upwards, the panels are fixed to the support frame at spacings as determined from Table 2 and edge distances shown in Figure 2.

Technical Investigations

14 Investigations

14.1 Based on DIBt Technical Approval Z-33.2-16, an assessment was made of the system's mechanical resistance, durability, behaviour in relation to fire and practicability of installation.

14.2 An assessment was made of the manufacturing process, associated quality control procedures, and performance of the panels in existing installations.

Bibliography

BS EN 438-2 : 2005 *High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (usually called laminates) — Determination of properties*

BS EN 438-6 : 2005 *High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (Usually called Laminates) — Classification and specifications for Exterior-grade Compact laminates of thickness 2 mm and greater*

BS EN 438-7 : 2005 *High-pressure decorative laminates (HPL) — Sheets based on thermosetting resins (Usually called Laminates) — Compact laminate and HPL composite panels for internal and external wall and ceiling finishes*

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

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

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

BS EN ISO 14001 : 2004 *Environmental Management systems — Requirements with guidance for use*

DIN EN 755-2 : 2013 *Aluminium and aluminium alloys; Extruded rod/bar, tube and profiles*

DIN 17440 : 2001 *Stainless steels — Technical delivery conditions for drawn wire*

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

15 Conditions

15.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

15.2 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.

15.3 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.

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

15.5 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.

15.6 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.