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Agrément Certificate

10/4718

Product Sheet 3

NOVELIS PVDF COIL-COATED ALUMINIUM SHEET AND COIL

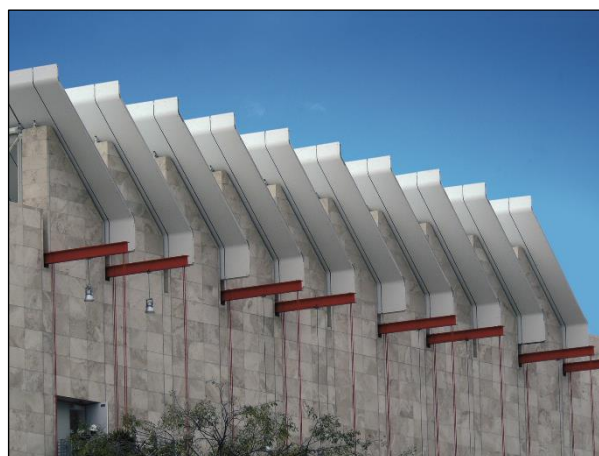
FF3 PVDF COIL-COATED ALUMINIUM COIL AND SHEET

This Agrément Certificate Product Sheet⁽¹⁾ relates to FF3 PVDF Coil-Coated Aluminium Coil and Sheet, coated aluminium alloy for use as external cladding.

(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

Weathertightness — the product has adequate resistance to the passage of moisture (see section 6).

Workability — the product can be worked by conventional techniques and is capable of accommodating a 2.5T bend at a minimum temperature of 20°C without damage (see section 7).

Properties in relation to fire — the product has an A1 reaction to fire classification to UNE-EN 13501-1 : 2007 and is unrestricted under the national Building Regulations (see section 10).

Durability — under normal conditions, the formed product will perform effectively as a cladding with an ultimate life of at least 40 years. In some industrial environments, maintenance painting to restore the sheet's appearance may be necessary after 20 years (see section 12).



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

On behalf of the British Board of Agrément

Date of Second issue: 5 September 2019

John Albon
Chief Scientific Officer

Originally certificated on 9 March 2010

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

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Regulations

In the opinion of the BBA, FF3 PVDF Coil-Coated Aluminium Coil and Sheet, 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:	B3(4)	Internal fire spread (structure)
Requirement:	B4(1)(2)	External fire spread
Comment:		The product is unrestricted under this Requirement. See section 10 of this Certificate.
Requirement:	C2(b)	Resistance to moisture
Comment:		The product can contribute to satisfying this Requirement. See section 6 of this Certificate.
Regulation:	7	Materials and workmanship (applicable in Wales only)
Regulation:	7(1)	Materials and workmanship (applicable in England only)
Comment:		The product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	7(2)	Materials and workmanship (applicable in England only)
Comment:		The product is unrestricted under this Regulation. See section 10 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		The product can contribute to a construction satisfying this Regulation. See sections 11 and 12 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	2.4	Cavities
Comment:		The product is unrestricted under this Standard, with reference to clauses 2.4.2 ⁽¹⁾⁽²⁾ , 2.4.3 ⁽²⁾ , 2.4.7 ⁽¹⁾ and 2.4.9 ⁽²⁾ . See section 10 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Standard:	2.7	Spread on external walls
Comment:		The product is classified as non-combustible and is therefore unrestricted under these Standards, with reference to clauses 2.6.4 ⁽¹⁾⁽²⁾ , 2.6.5 ⁽¹⁾ , 2.6.6 ⁽²⁾ and 2.7.1 ⁽¹⁾⁽²⁾ . See section 10 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.10.1 ⁽¹⁾⁽²⁾ , 3.10.5 ⁽¹⁾⁽²⁾ and 3.10.7 ⁽¹⁾⁽²⁾ . See section 6 of this Certificate.
Standard:	7.1(a)	Statement of sustainability
Comment:		The product can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for the product under Regulation 9, 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 product is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The product can contribute to satisfying this Regulation. See section 6 of this Certificate.
Regulation:	35(4)	Internal fire spread — Structure
Regulation:	36(a)	External fire spread
Comment:		The product is unrestricted under these Regulations. See sections 10 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 section: 3 *Delivery and site handling* (3.4) of this Certificate.

Technical Specification

1 Description

1.1 FF3 PVDF Coil-Coated Aluminium Coil and Sheet is manufactured from 3 mm thick aluminium alloy of grade AW 5754 temper designation H42 to BS EN 1396 : 2015. Information on chemical composition and temper designation is given in BS EN 573-3 : 2013 and BS EN 515 : 2007 respectively.

1.2 The product is coil-coated with a primer and a polyvinylidene fluoride (PVDF) topcoat to a total thickness of 21 to 26 µm. Non-standard colours are available in thicknesses outside of the normal ranges by arrangement with the Certificate holder. A lacquer coat 3 µm thick is applied to the reverse side.

1.3 The product is available in a range of colours at gloss levels of 10 to 30 units.

1.4 A protective polyethylene film, printed with the Novelis logo, is applied to the top surface of the product.

2 Manufacture

2.1 In a coil-coating process, aluminium coil is degreased, chemically pre-treated and coated on the face side with PVDF paint. The PVDF coating is applied in two layers (primer and topcoat). The reverse side is coated with lacquer.

2.2 Quality control is exercised over raw materials, during manufacture and on the final product.

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

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

3 Delivery and site handling

- 3.1 The product is supplied in sheet form to specialist companies who form façade elements using a variety of folding, bending and roller curving machines. These façade elements are then delivered directly to site.
- 3.2 The product is normally delivered to site on trailers and unloaded by crane. The site must have adequate access and a suitable surface for this traffic.
- 3.3 During transport, the edges and corners of the product must be protected against damage, and the product should be restrained to prevent abrasion.
- 3.4 On site, the product should be stored on a firm, dry base, on bearers at a maximum spacing of 900 mm, away from the possibility of damage, and covered to prevent the ingress of water. They should be stored as close as possible to the building where it is to be installed and handled in accordance with the Manual Handling Operations Regulations 1992.
- 3.5 When required for installation, the product should be lifted from the stack, rather than dragged across it.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on FF3 PVDF Coil-Coated Aluminium Coil and Sheet.

Design Considerations

4 General

- 4.1 FF3 PVDF Coil-Coated Aluminium Coil and Sheet, after fabrication into façade elements, is suitable for use as non-loadbearing cladding.
- 4.2 Each elevation should be clad with material from the same batch.

5 Practicability of installation

The product should be installed by operatives experienced with this type of material.

6 Weathertightness



The formed product, when incorporated into a cladding system designed and installed in accordance with conventional good practice and section 14, will adequately resist the passage of moisture.

7 Workability

- 7.1 The product can be worked by conventional techniques including break-pressing, roll forming, bending, drilling and punching. It is essential that the correct tools in good condition are used, to prevent any damage to the coating, and that any swarf is removed. The protective film should be left on the product as long as possible to prevent scuffing or scratching of the paint finish.
- 7.2 To avoid cracking during forming, bends should be preformed at a minimum temperature of 20°C and at a minimum bending radius of 7.5 mm (equivalent to 2.5T, according to BS EN 13523-7 : 2014). Tighter bends may be achieved by routing out where the material is to be bent, in accordance with the Certificate holder's instructions.
- 7.3 The material may be stud-welded in accordance with the Certificate holder's instructions.

8 Compatibility

To prevent electro-chemical corrosion, direct contact with copper or water run-off from copper, or direct contact with lead in coastal environments, should be avoided. Fixing devices must be of, or compatible with, aluminium. Precautions must also be taken (eg by using a strip sealant) to prevent direct contact with timber preserved with copper or fluoride compounds or treated with a fire retardant.

9 Resistance to impact

The impact resistance of the product will depend on the geometry of the individual façade elements and the supporting framework. The product is 3 mm thick and is unlikely to be damaged by low-energy impacts. The paint finish can withstand considerable distortion without loss of adhesion.

10 Properties in relation to fire



FF3 PVDF Coil-Coated Aluminium Coil and Sheet is classified as A1 in accordance with UNE-NE 13501-1 : 2007⁽¹⁾. This classification applies to the product used on façades and is valid for all colours. It is valid for substrates for final use based on wood and also those with Classes A1 and A2-s1, d0 (concrete, brick wall etc), and for air gaps of 20 mm or higher. The product is not subject to any restriction on building height or proximity to boundaries.

(1) The fire report summary from Applus laboratories for Novelis FF2 is referenced 18/18446-2270 Part 2 M1. Fire safety Certificate No APF-1445 from Applus extends the scope of the report to include Novelis FF3. Copies are available from the Certificate holder.

11 Maintenance



11.1 In some areas (eg industrial areas and where cladding is sheltered directly beneath a soffit) it may be necessary to clean the installation periodically, both to restore its appearance and to remove potentially corrosive deposits. This can be done by hosing with water, using a neutral detergent.

11.2 Damaged panels may be replaced using normal installation techniques.

12 Durability



12.1 The formed product will perform effectively as a cladding with an ultimate life of at least 40 years.

12.2 In some industrial environments, maintenance painting to restore the sheet's appearance may be necessary after 20 years.

12.3 A planned maintenance cycle should be introduced if an extended design life is required.

12.4 The aluminium substrate is durable. Although it may be exposed (eg at cut edges, through impact damage, or at hairline cracks at the crown of the profile), it will perform satisfactorily in all normal atmospheric conditions (including coastal and industrial, but excluding areas where there are sources of abnormal corrosive contaminants, eg chemical works, cement works or copper foundries).

12.5 The coatings are colour-fast and the performance of the coating will depend upon the colour chosen, environment, location and aspect. Colour changes will be slight and uniform on any one elevation.

13 Reuse and recyclability

The product contains aluminium, which can be recycled.

Installation

14 General

The installation of FF3 PVDF Coil Coated Aluminium Coil and Sheet is carried out in accordance with the Certificate holder's installation instructions.

Technical Investigations

15 Tests

Tests were carried out and the results evaluated to determine:

- impact resistance
- scratch resistance
- abrasion resistance
- resistance to marking and staining
- effect of artificial weathering
- effect of salt spray
- ease of forming
- resistance to sulfur dioxide
- adhesion of paint layer.

16 Investigations

16.1 Independent test data were examined relating to reaction to fire to UNE-EN 13501-1 : 2007.

16.2 Factory visits were made to examine the manufacturing process and obtain details of the raw material specifications and quality control procedures.

Bibliography

BS EN 515 : 2017 *Aluminium and aluminium alloys — Wrought products — Temper designations*

BS EN 573-3 : 2013 *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Chemical composition and form of products*

BS EN 1396 : 2015 *Aluminium and aluminium alloys — Coil coated sheet and strip for general applications — Specifications*

BS EN 13523-7 : 2014 *Coil coated metals — Test methods — Resistance to cracking or bending (T-bend test)*

UNE-EN 13501-1 : 2007 + A1 : 2010 – *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*

17 Conditions

17.1 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.

17.2 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.

17.3 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.

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

17.5 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.

17.6 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.