Novelis Pre-Painted Aluminium

Aluminium for Building Applications

FALZONAL®

Novelis

Pre-painted aluminium for building applications

Whether for renovation or for new projects, it is usually economic considerations that prompt the use of pre-painted aluminium for ventilated facades. A wide range of design options, durability and the recyclability of aluminium at the end of the building life cycle, and thus the aspect of sustainability, are reasons for choosing aluminium. In addition to the weather protection function for the building, the material must also meet the demanding physical property requirements.

Novelis pre-painted aluminium for facades, interior design and roofing

Novelis has developed solid pre-painted aluminium products in different material thicknesses especially for façade cladding, interior design applications and roofing:

Pre-painted aluminium for facades & interior, 2.0 mm thickness

Pre-painted aluminium for facades & interior, 3.0 mm thickness

Pre-painted aluminium for roof applications, 0.7 mm thickness

Coil-coating process: durable & UV-resistant pre-painted aluminium 4-5
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Überseering 8, Sunrise Silver & Effektanthrazit, Hamburg / Germany

ZSP – Zentrum für Studium & Promotion, Lavarot,
Hamburg / Germany

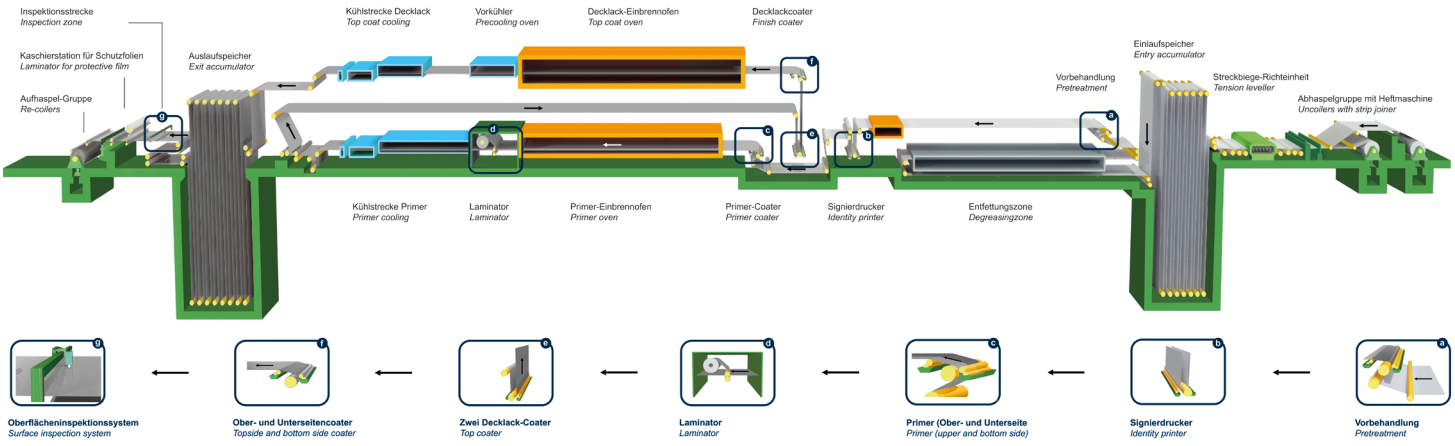
Coating in the coil-coating process

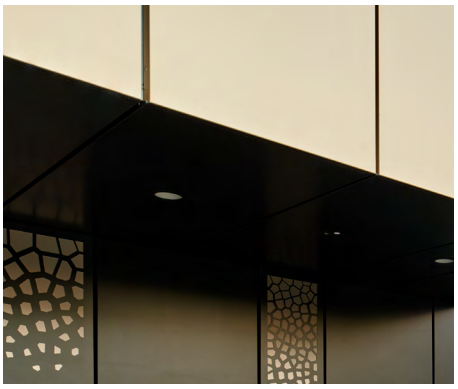
The decisive factor for lasting color consistency are high-quality and durable surfaces.

This is why we coat Novelis ff2®, ff3® and FALZONAL® pre-painted aluminium in a continuous coil-coating process. Solid and metallic paints and special colors are applied in two or four coats and then permanently stove-enameled. This process ensures a durable, brilliant color consistency.

Technical data paint line, Novelis plant Göttingen (Germany)

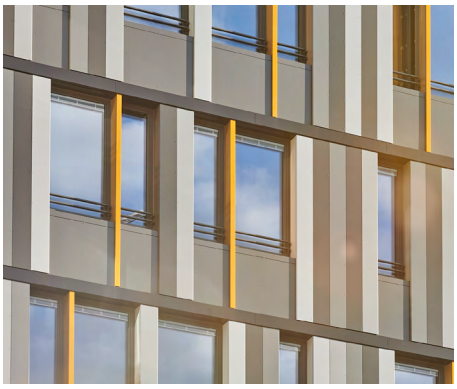
Supplier		Sundwig
Year of construction		1978
Total length of the line		approx. 181 m
Strip thickness	min. / max.	0.2 - 2.0 mm
Strip width	min. / max.	1,000 - 1,650 mm
Coil inner diameter		600 mm
Coil outer diameter	max.	1,950 mm
Coil weight		10,000 kg
Strip length in process		approx. 650 m
Storage volume / capacity		entry: 150 m, exit: 190 m
Product portfolio		Building & Architecture (facades, windows, roofing), hollow bars, decorative trims, valve discs, car license plates, traffic signs





CIGL – Center for Infection and Genomics of the Lung, Drumgoldmetallic & Normschwarzgrau, Giessen / Germany

DESY Start-Up Lab, Azurblaumetallic, Hamburg / Germany



EUREF Campus, Küstengrau, Siamgrau, Austergrau, Felsgrau, Gletschergrau, Wolfsgrau, Mayagold, Berlin / Germany

Durable and UV-resistant pre-painted aluminium

Products for high-quality architecture with high demands on decorative appearance for exterior and interior use are surface-finished at Novelis with durable and tested HDCC paint systems of the highest quality.

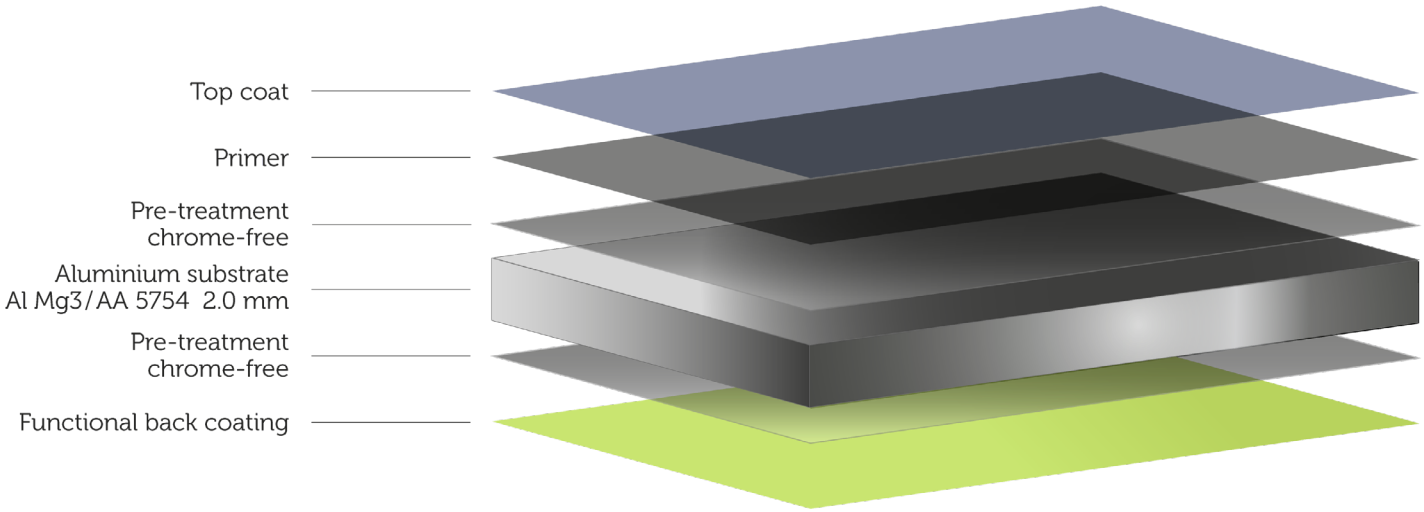
The primarily inorganic HDCC coatings are particularly suitable for outdoor use and are characterized by their high resistance to UV radiation and environmental influences – even in extreme climatic zones.

HDCC is based on the latest paint developments that meet the ever-changing sustainability and health requirements (REACH conformity according to 1907/2006).

Structure:	
– 2-layer systems:	25 µm (+2/-2 µm)
– 4-layer systems:	30-40 µm (+4/-2 µm)
– Printing-systems:	30-35 µm (+4/-2 µm)

Coating structure

using the example of HDCC (primer + topcoat) for application ff2®



TU IET, Sunrise Silver & Anthrazit Soft Metallic,
Dresden / Germany

DESY Start-Up Lab, Azurblaumetallic,
Hamburg / Germany

Novelis HDCC paint system – sustainable, durable, versatile

Advantages of HDCC paint system (vs. PVDF)

- **Focus on sustainability & safety**
  - 40 % CO_2 reduction
  - REACH conformity (status 05/2024)
  - Fire safety: non-combustible, acc. to DIN EN 13501-1
- **Stability in color**
  - UV-tests & UV-resistance divided into color & gloss
  - HDCC – color: 6; gloss 5; RUV4, RUV5 under review
  - PVDF – color: 5; gloss 6
- **Much wider gloss possibilities**
  - HDCC: 5 - 80 units (acc. to DIN EN 13523-2)
  - PVDF: 10 - max. 40 units gloss
- **More color diversity!**

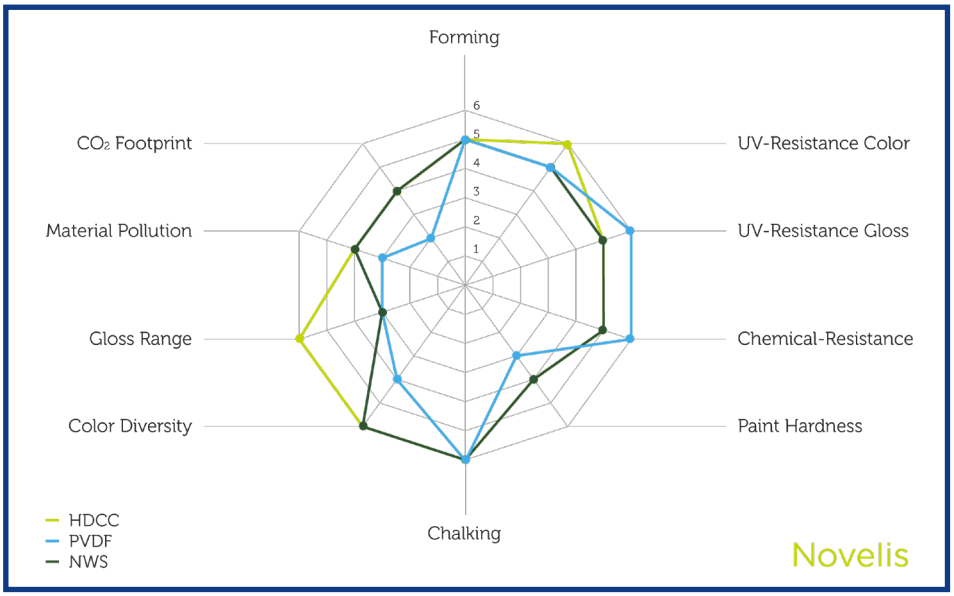
40 % less CO_2

Novelis HDCC (**H**igh **D**urable **C**oil-**C**oat) is a newly developed paint system which has the same quality level as the PVDF paint system used in the past for Novelis pre-painted aluminium products.

However, Novelis HDCC is more sustainable in comparison with PVDF and also offers a wider range of colors and gloss.

HDCC, PVDF and NWS in comparison

	HDCC	PVDF	NWS
Forming	5	5	5
UV-resistance color	6	5	5
UV-resistance gloss	5	6	5
Chemical-resistance	5	6	5
Paint hardness	4	3	4
Chalking	6	6	6
Color diversity	6	4	6
Gloss range	6	3	3
Material pollution	4	3	4
CO2 footprint	4	2	4
TOTAL	**51**	**43**	**47**



CIGL – Center for Infection and Genomics of the Lung,
Drumgoldmetallic & Normschwarzgrau,
Giessen / Germany

Colors for modern and outstanding architecture

Metallic and shine effect or high-gloss to matt: various solid and metallic colors, copper tones, stainless steel optics, various printing systems and imitations of natural stone or wood surfaces – Novelis is constantly developing new surfaces for individual accents and appearances in architecture.

(Special colors according to NCS, RAL, RAL Design on request.)

Our product solutions for façades, interior design and roofing

Novelis has developed solid pre-painted aluminium products in different material thicknesses especially for façade cladding, interior design applications and roofing:

f2®

Pre-painted aluminium for facades & interior, 2.0 mm thickness

f3®

Pre-painted aluminium for facades & interior, 3.0 mm thickness

FALZONAL®

Pre-painted aluminium for roof applications, 0.7 mm thickness

High-quality alloy for wider span-width

TÜV Nord Campus, Anthrazitgrau & Kristallsilber, Essen / Germany

Flat – stress-free – high strength

The 2.0 mm thick aluminium panel ff2®, with its AlMg3 alloy in temper H42 developed especially for facades, similar span and fixing widths like established AlMg1 alloys with a thickness of 3.0 mm. This means that the weight of material is reduced by a third and that the same span width can be obtained wit this lower material thickness. The material is ideal for minimizing material handling, installation and transportation costs.

AlMg3, thickness 2.0 mm = 5.4 kg/m²
AlMg1, thickness 3.0 mm = 8.1 kg/m²

Even in large surface applications under high stress loads, e.g. in high-rise buildings with extreme wind loads, ff2® is the perfect solution:

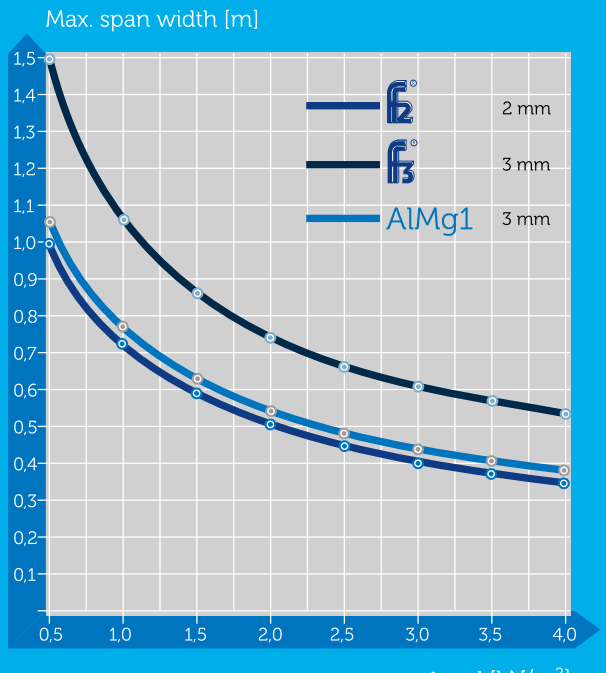
- The material has a low weight per surface area,at 5.4 kg/m².
- Nevertheless, effortlessly the solid aluminium material stands up to high wind loads. Building movements and temperature changes are compensated without any problems.
- As the alloy is seawater-resistant, ff2®, ff3® and FALZONAL® can be used in extreme climate zones.
  (German Lloyd Certification)

Structural design comparison ff2®, ff3®, AlMg1

Load [kN/m²]	ff2® 2 mm	AlMg1 H14 3 mm	ff3® 3 mm
0,5	1,00	1,02	1,50
1,0	0,71	0,72	1,06
1,5	0,58	0,59	0,87
2,0	0,50	0,51	0,75
2,5	0,45	0,46	0,67
3,0	0,41	0,42	0,61
3,5	0,38	0,39	0,57
4,0	0,35	0,36	0,53

Max. span width [m]

according to DIN EN 4113, DIN EN 1396



Easy processing – facade & roof applications

Whether you prefer panels, cassettes or flat sheets and whatever type of substructure you prefer, ff2® and ff3® are equally well-suited for ventilated and non-ventilated cladding structures.

The easy forming properties of ff2® make the material ideal for concave or convex shapes, corners, closures, column casing and other details. Coil-coated aluminium can be processed after coating.
When making cassettes and panels the minimum bending radius and the processing temperature should be taken into consideration (see technical data).

ff2® and ff3® can be easily drilled stamped, punched, bent, trimmed and stud welded without any damage to the material or painted surface.

For protection from damage and dirt during transportation, processing and installation, the material is supplied with an ultraviolet-resistant protective film on the painted side. This foil remains on the sheet during installation and is simply pulled off after the completion of installation. The film is recyclable and has no detrimental effect with rainwater.

Viega Car Park,
Kristallsilber & Mineralgraumetallic,
Attendorn / Germany

Théâtre-Sénart, Sunrise Silver,
Sénart Lieusaint / France

Überseering 8, Sunrise Silver & Effektanthrazit,
Hamburg / Germany

The alloy, coating and elasticity of FALZONAL® pre-painted aluminium has been specially geared for working in plumbing technology. FALZONAL® is therefore ideal for lock-welt technologies such as double lock-welt or ledge roof technologies (see graphic), but can also be cut, sawn, folded, drilled or riveted without problem using standard machines – and without the coating chipping or cracking.

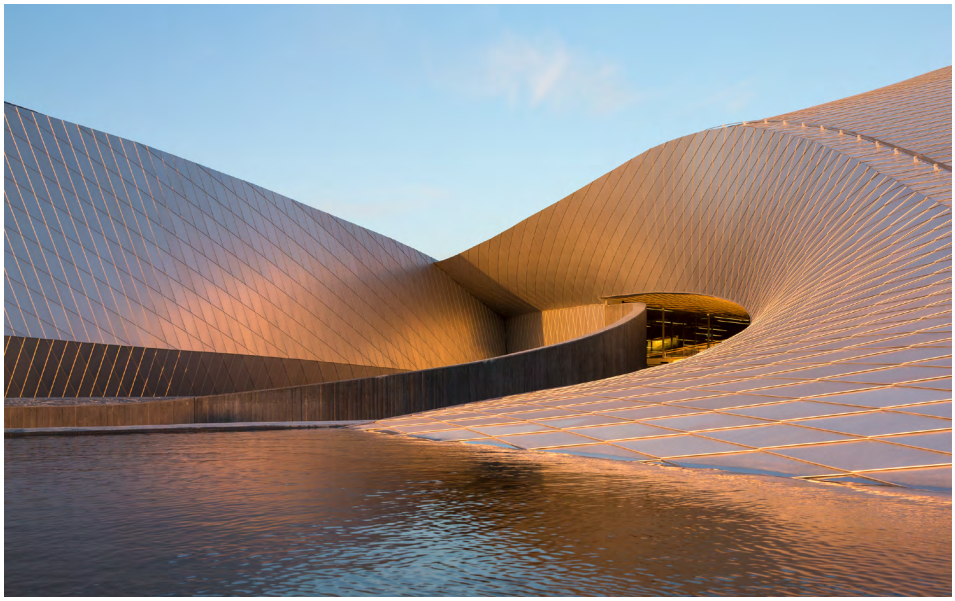
Durable and safe

State-of-the-art production processes lead to consistently high quality of substrate and coating. Novelis pre-painted aluminium ff2®, ff3® and FALZONAL® are stable, permanently corrosion-resistant and extremely durable. This keeps walls and roofs permanently sealed and protected.

Cleaning

The Novelis HDCC paint system a highly cross-linked surface that makes dirt adhesion more difficult.

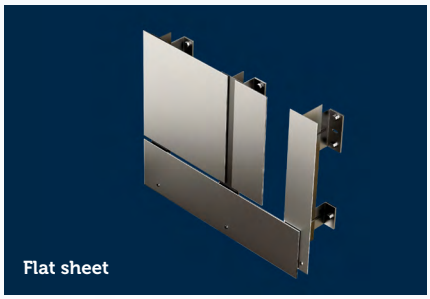
Novelis ff2®, ff3® and FALZONAL® are dirt-repellent and require very little maintenance. Minor dirt can be cleaned by using environmentally friendly warm water and neutral detergents. Graffiti can normally be removed using special cleaning agents. We refer to the cleaning instructions of the ECCA.

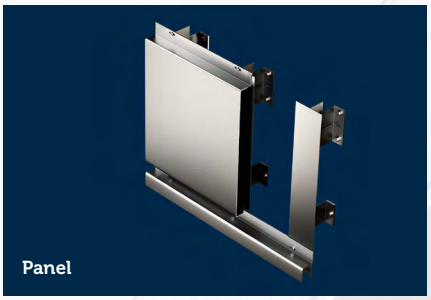


Blue Planet Aquarium, weathering clear coating,
Kopenhagen / Denmark

Installation techniques – rear ventilated curtain wall facades

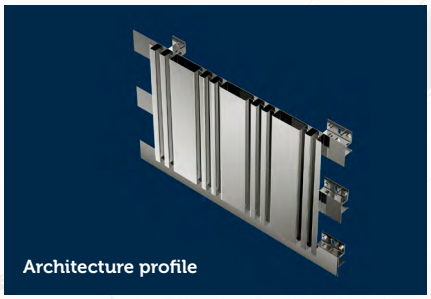
Conventional fastening techniques:


Flat sheet


Panel


Cassette


Bolt suspension


Architecture profile

Adhesive bonding:

The lacquer on the reverse side of Novelis facade material is specially designed for bonding. For this reason ff2® and ff3® sheets can be adhesive-bonded to the substructure without any visible fixings. Reinforcements can eastly be bonded into the cassettes.

Regulated by German building authority DIBt for adhesive bonding with Sika Tack-Panel

Alice Lane, Sunrise Silver, Johannesburg / South Africa

Fire leaves us cold!

Novelis pre-painted aluminium has been certified in accordance with the latest DIN EN 13501 non-combustibility standards.

Under building regulations, only non-combustible materials may be used in buildings which are exceeding a certain height (approx. 22 m). For public facilities such as nurseries, schools, hospitals hotels, airports etc., this requirement applies irrespective of the height of the building.

Novelis ff2® and ff3® facade products and Novelis FALZONAL® for roof applications received the highest rating of A1 in the combustibility tests.
ff2®, ff3® and FALZONAL® also obtained convincing results in the categories of smoke development and dripping fires.

This means that ff2®, ff3® and FALZONAL® can be used on any building on any height without any restriction.

DIN EN 13501 A1

EUREF Campus,
Küstengrau, Siamgrau, Austergrau, Felsgrau,
Gletschergrau, Wolfsgrau, Mayagold,
Berlin / Germany

Our purpose: Shaping a Sustainable World Together

Novelis is the leading manufacturer of flat rolled aluminium products and the world's largest recycler of aluminium. Together with our customers, we work on innovative, sustainable solutions and processes to exploit the full potential of aluminium as an infinitely recyclable material and thus contribute to lower CO2 emissions.

As the world's largest recycler of aluminium, we have an essential role in the aluminium value chain.

We know it is the best way, to keep aluminium "in the loop" in order to contribute to the decarbonization of our industry. That is why we are developing innovative alloys with a high recycled content, invest in recycling capacities and capabilities and work together with our customers and partners within the value value chain to promote the circular economy throughout our industry. Aluminium is perfectly suitable to be used again and again.

Naturally, all process scrap at Novelis is segregated by alloy and fed back into the production process **by**

100 %.

Novelis pre-painted aluminium is produced by the environmentally friendly coil-coating process. All paints and lubricants are processed in a closed material cycle.

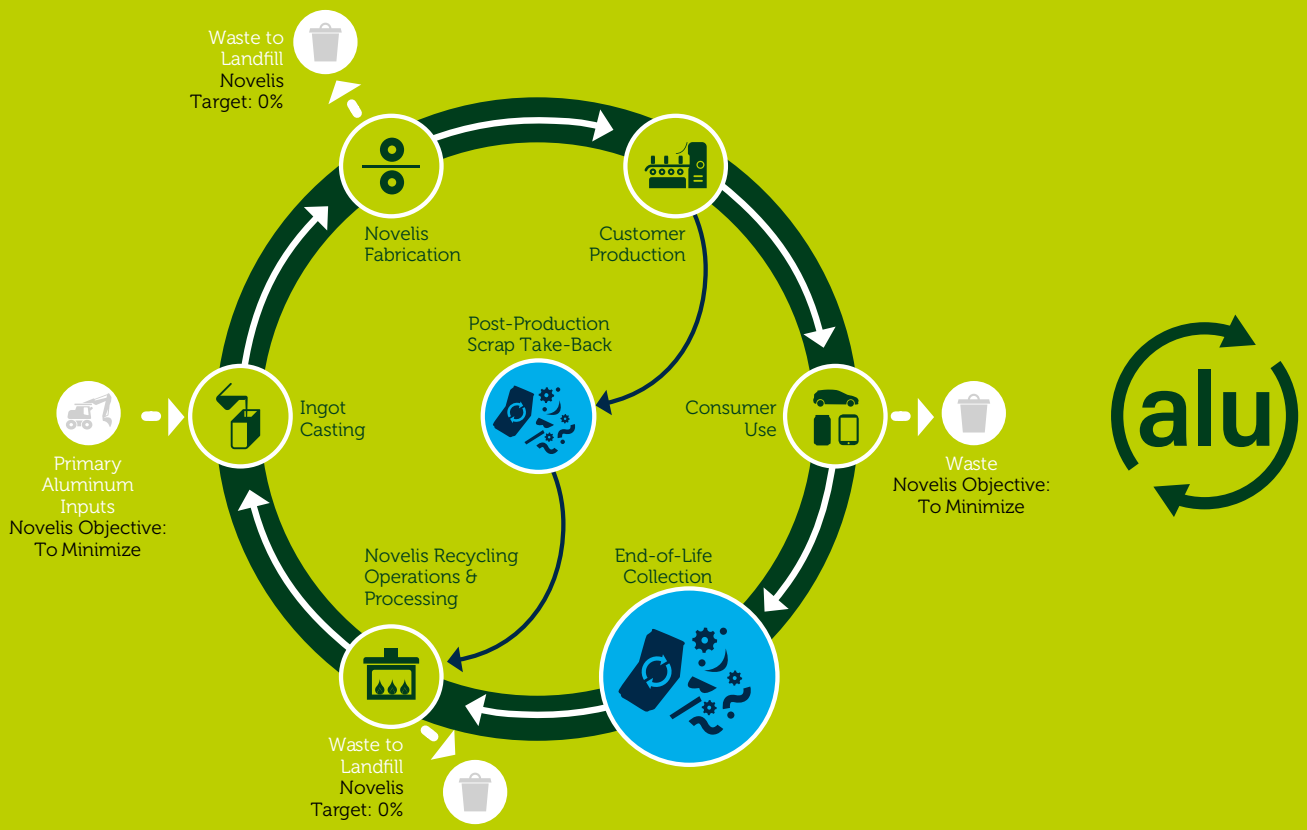
When stoving the lacquer, 100 % of the extracted solvents are combusted and fed back into the process.

The pigments used in the paints are non-hazardous. The paint systems for Novelis pre-pained aluminium are subject to all current REACH regulations.

Novelis solid aluminium products ff2®, ff3® and FALZONAL® can be recycled almost 100 % and returned to the material cycle at the end of the product or building life cycle without any loss of quality.

Recycling aluminium uses only **5 %** of the energy it takes to produce primary aluminium, lowering CO emissions **by as much as**

95 %.



Technical data

Alloy
Novelis WG-53S, EN AW-5754 (AlMg3) to EN 573-3, AA 5754 (international designation)

Dimensions
Sheets in standard dimensions

Thickness:	ff2®:	2.0 mm
	ff3®:	3.0 mm
	FALZONAL®:	0.7 mm
Width:	1,500 mm to 1,600 mm	
Length:	3,000 mm to 6,000 mm	

(narrowest width: 1,000 mm)
Special dimensions on request

Mechanical properties
Temper H42 to EN 1396
Tensile strength: R_m 220 – 260 Mpa
Elongation limit: $R_{p0.2}$ 165 – 215 Mpa
Elongation: A_{50} > 9 %
Permissible stress: σZul = 96 Mpa to DIN 4113

Linear expansion
Co-efficient of linear expansion 0.024 mm/m/°K

Elasticity
Modulus of elasticity 70,000 MPa

Coating quality
Novelis HDCC (High Durable Coil-Coat)
NWS (Novelis Wrinkle System)

Coating thickness
Front face approx. 22 - 40 µm, depending on the color
Reverse face approx. 3 µm protective coating

Fire protection
ff2®, ff3® and FALZONAL® are non-combustible according to DIN EN 13501-A1

Corrosion resistance
Novelis pre-painted aluminium ff2® complies the requirements according to EN 1396:2007: C.6.1.1: category 2B and C.6.1.4, table C1, category 2b DIN EN 1396; Annex C, Procedure C 6.5 (ASTM G85)

Gloss variety
5-80 unities, NWS: 2-5 unities (according to DIN EN 13523-2), measuring angle 60°

Colors
Metallic and shine effect; high-gloss to matt. Various solid and metallic colors, copper tones, stainless steel optics, various printing systems and imitations of natural stone or wood surfaces. Special colors according to NCS, RAL, RAL Design on request.

Installation
Please note the following when installing ff2®, ff3® and FALZONAL®:
We recommend using panels from one manufacturer's batch. Especially all metallic colors must be installed in the same coating direction.

Precise instructions for the direction of application are printed on the back of the sheets and on the protective film.

Quality control
Quality control is carried out in accordance with the Novelis factory standard, the EN, DIN, ASTM and BS standards and the ECCA guidelines. Quality assurance is subject to ISO 9001.

Certifications
- DIN EN ISO 9001
- DIN EN ISO 14001
- DIN EN ISO 50001
- OHSAS 18001

All Novelis Europe plants have been certified to the international Aluminium Stewardship Initiative (ASI) on both the Performance Standard and the Chain of Custody Standards.

All information and technical specifications correspond to the technical status and the resulting experience at the time of publication of the corresponding edition. We therefore reserve the right to make changes.

Blue Planet Aquarium, weathering clear coating, Copenhagen / Denmark

11/2024 · 2nd release

Shaping a Sustainable World Together

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Herford / Germany

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