

Product Description

Novelis Pre-painted Aluminium

08.08.11

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Issue 3

This product description is valid for coil coated aluminium sheets and coils for the production frontage cladding systems.

The material is coated on both sides:

On top side with PVdF and on the bottom side with a protective lacquer. In addition the top side is covered by a strippable protective film

1. Processing Advises

The coils and sheets can be processed by cutting, blanking, punching and milling and be formed by bending. To avoid cracking during forming one has to adhere to a minimum inner bending radius and a minimum temperature.

- minimum inner bending radius:

2.5T according to DIN EN 13523-7

sheet gauge 2,0 mm:

$R_i = 2.5 \times 2,0 \text{ mm} = 5 \text{ mm}$

- minimum metal temperature during forming process:

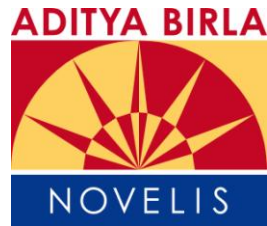
20 °C

2. Installation Advises

To ensure colour and gloss uniformity only sheets from productions with the same identification number are to be laid on one level of the facade. Sheets with metallic coatings must always be laid in the same direction. This also is proposed for solid colours.

An identification number is printed on the back side of the sheet. An arrow within the identification number indicates the coating direction.

No peel of paint during punching, drilling, bending process.



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Façade elements from ff2-sheet are statically determinable structural components. The stability against stresses can be calculated in all cases.

3. Metal Substrate

3.1 Alloy: WG-53S acc. to Novelis designation
 EN AW-5333 [AlMg3] acc. to EN 573-3
 with tighter tolerances
 AA 5754 acc. to international designation

3.2 Temper: H42 acc. to Novelis designation, with reference to
 EN 1396 (WG-53S)

3.3 Mechanical Properties (transverse to rolling direction):
 according to internal standard, EN 1396 and EN 10002-1

Tensile strength R_m : 220 - 260 MPa
 Proof stress $R_{P0,2}$: 165 - 215 MPa
 Elongation A_{50} : $\geq 9\%$

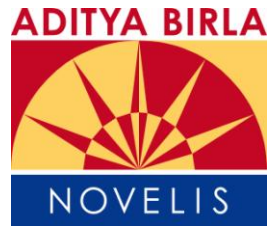
4. Dimensions and Tolerances according to EN 485-4 (DIN 1783) ½ EN

4.1 Gauge: 2,0 mm (including paint)

| | |
|----------------|--------------|
| < 1000 mm | +/- 0,055 mm |
| 1001 - 1250 mm | +/- 0,075 mm |
| 1251 – 1600 mm | +/- 0,080 mm |

| | | |
|-------------|---------------|----------------|
| 4.2 Widths: | 501 - 1250 mm | + 1,5 / - 0 mm |
| | > 1250 mm | + 2,0 / - 0 mm |

| | | |
|--------------|----------------|----------------|
| 4.3 Lengths: | 750 - 1000 mm | + 3,0 / - 0 mm |
| | 1001 - 3000 mm | + 4,0 / - 0 mm |
| | > 3000 mm | + 5,0 / - 0 mm |



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5. Coatings

5.1.1 Pre-treatment: degreasing and chemical pre-treatment on both sides according to internal standard.

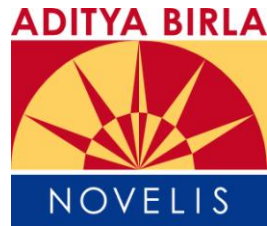
5.1.2 Front: PVdF (Polyvinylidenfluorid),
Kynar 500 / Hylar 5000,
80/20 (80%PVdF, 20%Acrylic resin)

| | | | |
|-------------------------|-----------|-----------|------------|
| 2-coat-systems: | 21-26 µm* | tolerance | (+2/-1 µm) |
| 4-coat-systems: | 30-40µm* | tolerance | (+4/-2 µm) |
| prints: | 30-35µm* | tolerance | (+4/-2 µm) |
| stainless style bright: | 42µm | tolerance | (+4/-3 µm) |

*depending on colour

| | |
|-----------------|---|
| gloss | approx. 20-80 units, (acc. to DIN EN 13523-2) depending on colour |
| deviation | delta E <2 units (acc. to DIN EN 13523-3) |
| hardness | F-H (acc. to DIN EN 13523-4) |
| impact test | 40 ip/mm (acc. to DIN EN 13523-5) |
| adhesion | very good (acc. to DIN EN 13523-6) |
| cupping | no de-lamination till fracture |
| T-bend | 2,5T (acc. to DIN EN 13523-7); 2,0T for 4-coat-systems |
| MEK-test | >100 double rubs (acc. to DIN EN 13523-11) |
| surface | uniform (internal standard) |
| UV-resist. | very good (internal standard) |
| ASS-test | after 500 hrs of exposure no corrosion; corrosion creep from scratch less than 2,0mm |
| Water immersion | after 1000 hrs no blistering no loss of adhesion |

5.1.3 colours according to Novelis colour chart or on special request.



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5.1.4 reverse: epoxy coat, transparent, Type 2916-25
thickness: approx. 3-6 μm^*
*depending on colour on front side

6. Coating Properties

6.1 Front: best colour and gloss durability,
best corrosion and chemical resistance,
no chalking

6.2 Back: suitable for bonding with most of the available glues
(2K-EP or 2K-PUR)

7. Protective Film

To protect the material against damages during processing and installation the sheets are covered by a white, UV-resistant protective film, which is printed with Novelis symbol and ff2 logo. This protective film can be easily stripped off.

Thickness: 80 μm

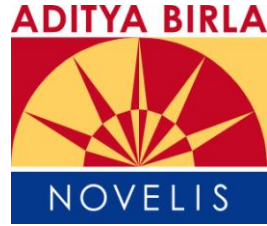
The protective film must be removed latest 6 months after installation.

8. Quality Control

8.1 Test Procedures

Novelis Deutschland GmbH is certified according to DIN EN ISO 9001:2000
(Certificate Registration No: 08 100 939026, valid until 2010-10-21.)

The quality control is carried out in accordance with European guidelines such as EN, ISO, DIN and ECCA.



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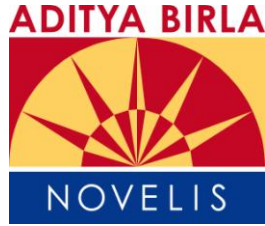
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The following criteria are tested to the corresponding standard:

| Tests | Standard |
|------------------------------------|--|
| Metal Substrate | |
| Chemical composition | EN 573-3 (<i>DIN 1725</i>) |
| Temper designations | EN 515 |
| Mechanical properties | Internal standard, EN 1396 |
| Tensile testing | EN 10002-1 |
| Tolerances on shape and Dimensions | EN 485-4 (<i>DIN 1783</i>) |
| Coating properties | |
| Pre-treatment | EN 1396 |
| Primer and top coat (thickness) | Internal standard |
| Gloss | DIN EN 13523-1 |
| Colour difference | DIN EN 13523-2 |
| Lacquer hardness - Pencil Test | DIN EN 13523-3 |
| Impact test | DIN EN 13523-4 |
| Lacquer adhesion after cupping | DIN EN 13523-5 |
| T-bend-test | DIN EN 13523-6 |
| Lacquer hardening - MEK test | DIN EN 13523-7 |
| Bonding test | DIN EN 13523-11 / Internal standard |
| Surface quality | Internal standard |
| Accelerated Exposure Tests | |
| Acetic acid salt spray test | DIN EN 13523-8 / ESS DIN 50021 / DIN EN ISO 9227 AASS under creep, blisters <1mm after 500h acc. to DIN EN 1396 table C.4 (see corrosion resistance index 3) |
| Water immersion resistance test | DIN EN 13523-9 not affected after 1000h |
| QUV-Test | DIN EN 13523-10 colour change < 5 Units |



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Outdoor Exposure Tests at:

Göttingen

Internal standard

Hoek van Holland

DIN EN 13523-19/21 / Internal Standard

Florida

Internal standard

9. Cleaning

Easy to clean with clear water or pH-neutral detergents. Graffiti can be easily removed from colours with gloss of 60 and 80. For all other colours environmentally friendly detergents are available in the market.

10. Fire Protection

Non-combustible A1, acc. to EN 13501

11. Health and safety aspects

Novelis Deutschland GmbH is certified according to:

- DIN EN ISO 14001 Environmental Management
- OHSAS 18001:1999 Occupational Health and Safety Management
- The Novelis guide lines are laid down in the Novelis Code of Conduct
- Novelis issues yearly Environmental Declarations

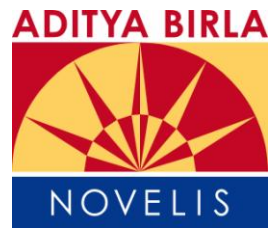
12. Others

No toxic substances are released into the environment from paints used for these products.

Any deviations to this product description are subject to a special agreement.

In the interest of technical progress we reserve the right to make any modifications.

We are not responsible for incorrect technical applications of our products.



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Germany

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