NOVELIS
Pre-painted aluminium

HIGHLIGHTS:
Antimicrobial Coating
Recycling of aluminium
NOVELIS is the world’s largest producer of rolled aluminium and the global leader in beverage can recycling. We are a growth-oriented company, drawing upon our industry-leading technology and expertise to develop and deliver an expanding portfolio of premium rolled aluminium products. Novelis is an important part of the worldwide Aditya Birla Group of companies. By partnering with our customers to bring innovative products to market, by being a leader in recycling, and by operating with a mindset of sustainability, Novelis makes the world lighter, brighter and better.

www.novelis.com
ALUMINIUM IS A MATERIAL WITH A FUTURE

- Coil coating helps make processing more effective
- Pre-painted aluminium is eco-friendly and sustainable

Coil coated right down the line

When efficiency and quality are vital, concepts and production methods are called for that meet both these requirements in manufacturing practice while maintaining close control of cost and ecological aspects.

The coil coating process takes quality and environmental standards to the max, with minimum use of paint and chemicals. Coil coating means paint first, then process. The coating is applied to the flat coil continuously in a roll coating process and constantly monitored.

Many square metres of coil can be coated quickly, cost-efficiently and satisfying top quality and ecological criteria.

This coupled with the high reproducibility provide an excellent platform for efficient processing and long product life.

Tension levelling to achieve optimum flatness

Optimum cleaning and pre-treatment for good paint adhesion
Consistent, reproducible high quality
Highly cost-efficient manufacturing
Unlimited applications

3 Uniform coating application in an optimised coil coating process. No paint losses or residues.
4 Curing ovens extract solvents at high temperatures, burn them off and feed the energy back to the process.
5 Film coating to protect the surface during further processing
Seal of quality

Novelis supplies the superior products essential for long-term market success. That’s why we attach great importance to developing new and improved products. Aluminium and coating are regarded as one unit from the outset and precision-tested in terms of their future use.

We have a dedicated development and innovation centre capable of carrying out all kinds of test methods ranging from formability and adhesion through weathering and scratch resistance to bondability and overpaintability.

Constant, in-process controls ensure that the highest quality requirements are met. We satisfy European and international standards as well as our own strict Novelis standards and our customers’ quality specifications. It goes without saying that our plants are quality-certified.

OUR NAME STANDS FOR

- Quality control at every stage of production
- Production in accordance with internationally established as well as Novelis standards
- Research laboratories for new and improved products
Processing

At Novelis, we join with customers in selecting alloys and coatings in order to precisely match processing and service requirements.

Novelis coil-coated aluminium is ideal for almost all forms of processing, whether it’s highly efficient roll forming or blanking, bending, deep drawing, embossing etc. The material can be joined easily by common methods such as adhesive bonding, clinching, riveting, stud welding and seaming.

Further processing steps such as bonding, foaming and film coating can be taken into account in defining properties. Custom colours, gloss levels, textures and decors can also be specified.

The most offbeat requirements open the way to tomorrow’s innovations.
### Over a thousand possibilities

#### NOVELIS PRODUCT RANGE

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alloys:</strong></td>
<td>1xxx, 3xxx, 5xxx series</td>
</tr>
<tr>
<td><strong>Tempers:</strong></td>
<td>H40; 41; 42; 44; 46; 48; 49</td>
</tr>
<tr>
<td><strong>Base metal:</strong></td>
<td>mill finish, bright mill</td>
</tr>
<tr>
<td><strong>Coatings:</strong></td>
<td>primed, full-cover, transparent</td>
</tr>
<tr>
<td><strong>Widths:</strong></td>
<td>max. 1.750 mm</td>
</tr>
<tr>
<td><strong>Slit widths:</strong></td>
<td>min. 23 mm (below on request)</td>
</tr>
<tr>
<td><strong>Thicknesses:</strong></td>
<td>0.2 to 3.1 mm</td>
</tr>
<tr>
<td><strong>Sheet length:</strong></td>
<td>max. 7,000 mm</td>
</tr>
<tr>
<td><strong>Blank shapes:</strong></td>
<td>as per drawings with + without punching</td>
</tr>
<tr>
<td><strong>Protective film:</strong></td>
<td>on request</td>
</tr>
<tr>
<td><strong>Coil inside diameter:</strong></td>
<td>400/500 mm</td>
</tr>
<tr>
<td><strong>Coil outside diameter:</strong></td>
<td>max. 1.750 mm</td>
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</table>

#### PRE-FINISHED

- Wide or slit coil
- Sheet or blanks
Matt, high gloss or mirror finish
Plain, brushed or embossed surface
Print coated or plain colored
For indoor or outdoor use

Processing and service requirements determine the material specification:

- Pure aluminium or alloy
- Soft or hard
- Indoor or outdoor use
- Ready painted or post-treatable (e.g. bonding or overpainting)
- Print coated or plain colored
- Matt, gloss finish or mirror finish
- Plain, brushed or embossed surface
- For deep drawing operations or flat blanks
- Easy-glide or scratch-resistant

Customers, your wish is our command!
Recycling – protecting the environment and saving resources

Aluminium is the material of the future. Consumption of rolled aluminium products in Europe is expected to continue to grow by 3–4% per year going forward. Aluminium is the ideal material from an ecological standpoint.

Used aluminium products can be easily recycled time and time again without quality loss.

A car number plate can become a facade while a facade panel can become a traffic sign.

That’s why 75% of all the aluminium ever produced is still in use today, though in most cases no longer in its original application.

Aluminium recycling makes sense both economically and ecologically because only 5% of the energy originally required for production is used for remelting.

Or to give you an example: Recycling a single aluminium beverage can save as much energy as a TV uses in three hours.

What’s more, Novelis is stepping up its recycling efforts. By 2020, the company aims to manufacture 80% of its products from recycled material. This is a huge step, and it’s being backed by investments to match. For example, new recycling capacity of around 50,000 tonnes per year is currently being created in the world’s largest aluminium rolling mill at Alu Norf in Neuss. From 2012, five to ten tonnes of liquid metal per hour from used aluminium products will go to the rolling mill to make new products. In Pieve, Milan, a further aluminium strip caster with upstream melting furnace for painted scrap is being installed.

Novelis is a world leader in aluminium recycling:
Every year, 40 billion beverage cans are recycled into raw material for new beverage cans.

Of its annual capacity of approximately 17,000 tonnes, 96% will be based on recycled process.

<table>
<thead>
<tr>
<th>RECYCLING RATES BY SECTOR:</th>
<th></th>
</tr>
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<tbody>
<tr>
<td>CONSTRUCTION</td>
<td>96%</td>
</tr>
<tr>
<td>TRANSPORT</td>
<td>95%</td>
</tr>
<tr>
<td>PACKAGING</td>
<td>82%</td>
</tr>
</tbody>
</table>

Thanks to high recycling rates, nowadays more recycled metal is used than primary metal.
NOVELIS' RECYCLING TARGETS

- Boost recycling rate worldwide across all sectors
- Increase beverage can recycling, e.g. in the USA from 57% today to 75% (Europe today: 66%)
- Maintain global market leadership in beverage can recycling
- Increase the use of recycled material within the company from less than 40% today to 80% in 2020
- Expand Novelis’ global recycling facilities
- Develop new alloys based on recycled material

Naturally, all process scrap at Novelis is segregated by alloy and fed back to the production process in its entirety.
Sparkling clean:
SAN B12 – New surfaces with hygienic coating

Novelis is working constantly on new, optimised surface designs for technologically innovative products. In association with world-leading research facilities, a hygienic coating has now been developed to eliminate the most common kinds of bacteria.

With its strongly antimicrobial effect, the new coating scores highly wherever reliable protection, reduced bacterial loads and clean surfaces are called for.
SAMPLE APPLICATIONS

The risk of bacteria being transmitted is greatest wherever large numbers of people congregate. This is why hygienic surfaces are most suited for use in the following areas:

- Doctor’s surgeries
- Clinics
- Kindergartens
- Schools
- Public offices
- Libraries
- Laboratories
- Toilets
- Baths/spas
- Wellness centres
- Fitness studios
- Retirement homes
- Food processing areas
- Kitchens/store rooms/cold rooms
- Air ducts
- Hygienically sensitive areas

A development milestone: Technological progress in the fight against bacteria

Its antimicrobial properties make the innovative hygienic product line particularly suited for use in clinics and other medical facilities as well as for air ducts and hygienically sensitive areas.

Special paint elements in the Novelis coating prevent or reduce the reproduction of germs, thereby breaking the transmission cycle.

This new paint has been developed in such a way that it can be applied in a coil coating line and subsequently processed like any other paint.

The hygienic surface is currently available in widths of up to 1,500 mm, in thicknesses of up to 0.8 mm and with a matte-white polyester paint coating.

It can, however, also be supplied in all common RAL colours subject to feasibility testing.

To afford the environment lasting protection as well as to comply with prevailing regulations, Novelis uses solely lead-free paints. For pre-treating the aluminium, the company employs a system that does without chromium completely while ensuring perfect paint adhesion to the substrate.

Novelis was one of the first companies to be certified in accordance with ISO EN 14001 and OHSAS 18001 by Registro Italiano Navale (RINA).

Coated product samples were tested in accordance with ISO 22196 in the laboratories of IMSL (Industrial Microbiological Services Limited) in the UK.

The results show the percent reduction in the microbial load achieved after an incubation period of 24 hours at 35°C and a relative humidity (RH) of > 95% compared with the starting condition.

<table>
<thead>
<tr>
<th>Bacteria type</th>
<th>Unit of measure</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staphylococcus aureus</td>
<td>%</td>
<td>&gt; 99.99</td>
</tr>
<tr>
<td>Listeria monocytogenes</td>
<td>%</td>
<td>&gt; 99.80</td>
</tr>
<tr>
<td>Escherichia coli O 157</td>
<td>%</td>
<td>&gt; 99.99</td>
</tr>
<tr>
<td>Enterobacter aerogenes</td>
<td>%</td>
<td>&gt; 99.99</td>
</tr>
<tr>
<td>Enterobacter faecalis</td>
<td>%</td>
<td>&gt; 99.99</td>
</tr>
<tr>
<td>Salmonella enteritidis</td>
<td>%</td>
<td>&gt; 99.90</td>
</tr>
<tr>
<td>Salmonella typhimurium</td>
<td>%</td>
<td>&gt; 99.99</td>
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