Aluminium

HYDRO

General Engineering

With its firm conviction that business and societal requirements are inseparably linked to from one another, Hydro has developed into an innovative, international company, engaged in two core business areas – energy and aluminium – for the manufacture of sustainable products. We can thus experience how even better solutions in the fields of mobility, work and housing are making our lives easier day after day.

The focus is on people

Respect for people, the environment and society is a prerequisite for long-term value creation. With this approach, Hydro stands for sustainable and future-benefiting development. We make optimum use of natural resources and resolutely develop innovative and cost-efficient products for new fields of applications. In this way, we create real value for our customers and the company.

Hydro is a leading international energy and aluminium company with activities in more than 40 countries. Our constant pursuit of new business opportunities and the further development of products and technology have seen us become the third largest aluminium supplier worldwide. With more than 80 years' experience in the production of aluminium, Hydro Aluminium is active throughout the entire value chain. We are a strong and versatile partner in the production and subsequent processing of cast, rolled and extruded products and in the design and implementation of efficient recycling concepts.

In close cooperation with our customers from all sectors of industry where aluminium is used, we make products that are lighter, safer and more durable. Hydro is already the market leader in foil, lithographic sheet and building systems as well as in engine blocks, heat exchangers and structural components for the automotive industry.

Hydro Aluminium's Business Sector Rolled Products is a specialist in the rolling and converting of customised strip and sheet. The Product Area General Engineering, with its network of five rolling mills, is by far the largest area with a capacity of more than 350,000 tonnes per year.

Products supplied by General Engineering are used everywhere in daily life, such as in:
- Private households
- Industrial applications
- Architecture
- Transport industry

From tealight cups to silos

Our product portfolio comprises strip and sheet for a broad range of applications – these extend from tealight cups through plaster strips to silos and heavy goods vehicles. Our products come in a wide variety of blank, embossed or coated surfaces. Thicknesses range from 80 µm to 12 mm; we also produce 40 mm-wide strip as well as sheet which is precisely 2,600 mm in width.

Our circular blanks for pots and pans are 300 mm in diameter, while sheet for shipbuilding applications can reach up to 12 metres in length.

Alloys of the 1xxx, 3xxx, 4xxx, 5xxx and 8xxx series guarantee optimum properties and functionality for the particular application. The range of variants available allows the customers of General Engineering to develop efficient solutions using aluminium.

Products for everyday life

Aluminium makes everyday life easier. Whether pots and pans, baking trays, household ladders, snow shovels, tealight cups or coins, the products of General Engineering display the best properties of the material.

A wide variety of products used in everyday life are made from General Engineering's customised strip and sheet. The list is getting ever longer since aluminium's low weight combines with its extraordinary stability and long service life to make it the material of choice. In the consumer durables sector, for example, more and more high-quality branded household goods are made from aluminium.

With regard to pots and pans, our customers are well ahead of the competition and can choose from a broad spectrum of alloys and dimensions. Aluminium also represents the optimum solution for baking trays. Its high thermal stability comes from the continuous casting process used to produce the continuous cast sheet. The market leader in household applications also uses aluminium from General Engineering to make its ladders.

The properties of the material depend on the alloy and the specialised manufacturing processes used to meet the specific requirements of the particular end application. Through close cooperation and joint development programmes, we have built up partnerships with our customers that stretch back many years. Mutual respect and shared values lead to trusting relationships.

A variety of solutions for industry and commerce

A multitude of industrial products exploit the enormous potential of our aluminium alloys. Today laminated tubes are replacing water conduits made of copper. Other sectors are implementing lightweight, cost-efficient solutions, which include standard strip and sheet for the stockholding industry, electrotechnical products, welded tubes, interior cladding for refrigeration equipment, panelling for the manufacture of apparatus and appliances as well as for heating and air conditioning systems, cryogenic equipment, car licence plates and aerosol cans for medication.

General Engineering offers not only a broad range of standard strip and sheet but also cut-to-size products to meet individual requirements. High quality combined with reliable service and on-time delivery have helped us become one of the largest suppliers to the European stockholding industry, with shipments of 150,000 tonnes per year. Backed by two finished goods warehouses, we are able to respond rapidly and flexibly to customer wishes and fill orders at short notice.

The use of aluminium in industry appears to be almost unlimited. From big industry to small-scale direct customers: new applications are being found in specialist areas as a result of innovative joint development. For example, we are one of the world's leading suppliers of high-conductivity aluminium for transformers. The development of a special alloy and the continuous strip casting process, which leads to particularly high conductivity, made this possible.

Our continuous product development has also led to new laminated tubes, consisting of multi-layers of plastic and aluminium. Nowadays, heating and water supply installations are almost exclusively made from this high-tech product, which meets extremely exacting requirements. Through the consistent high quality of its manufacturing processes, General Engineering has established itself as a major partner to this industrial sector.

Light and resistant: Aluminium in architecture

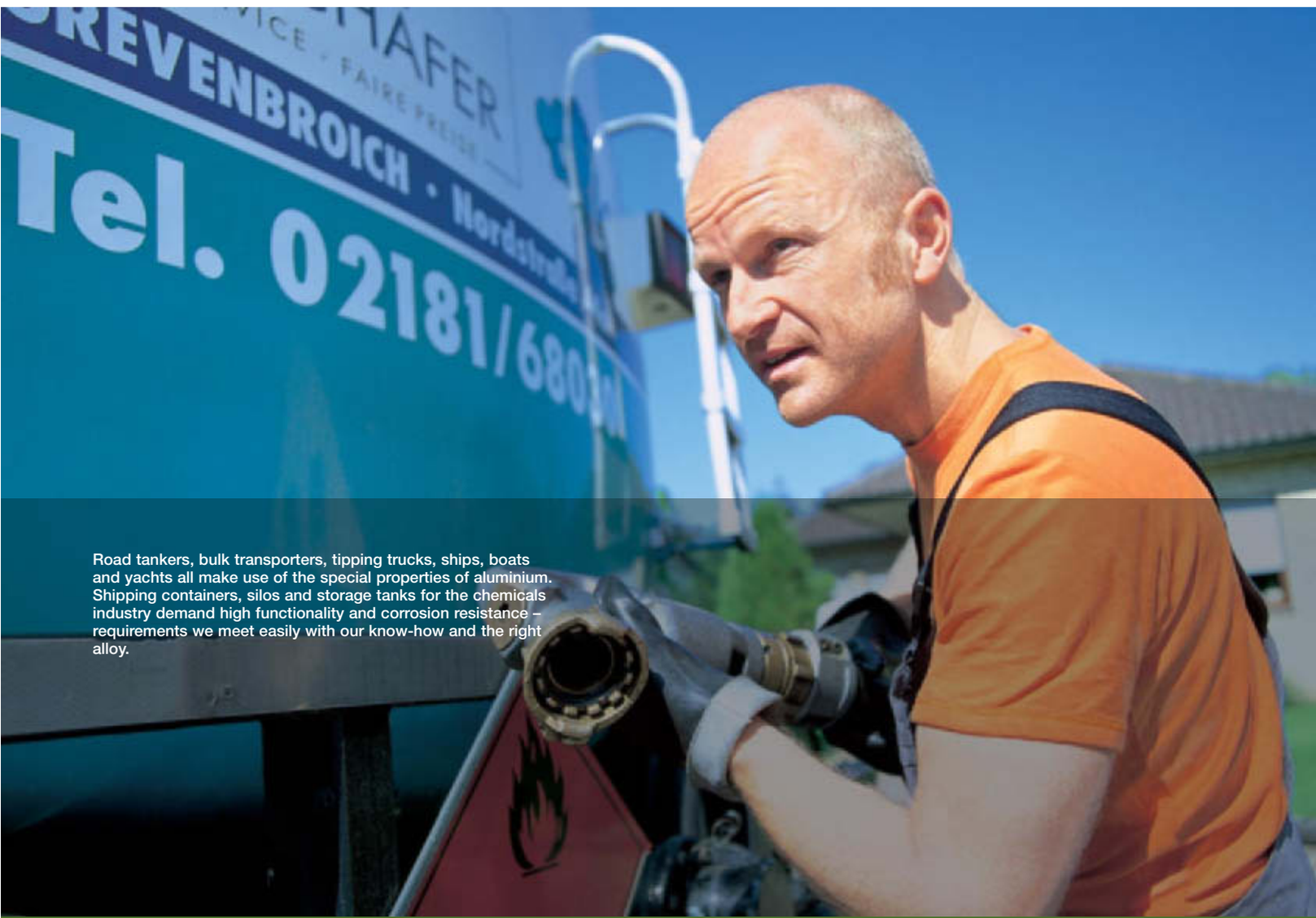
Aluminium supplied by General Engineering ensures a long service life in and on buildings. Our plain, embossed and coated strip and sheet are used for roof and façade systems, for roller shutters, Venetian blinds and ceiling panels. Aluminium is now almost indispensable in such applications as house doors and roller shutter doors, spacer strips in window systems and also plastering strips.

Aluminium is particularly appealing in architecture due to its decorative potential. It is however the material's resistance to weathering, low weight and easy workability which makes it such a well-loved "all-rounder". Worldwide, architects and builders use aluminium to give their building projects – such as public and industrial buildings, offices and tall buildings – added character.

General Engineering's broad product range covers nearly all applications in building and construction. Our plain sheet and coil for façade systems are renowned for their excellent surface quality, formability and flatness. Decisively, the unique quality of our products ensures optimum subsequent processing at our customers.

The coated products from our coating line in Holmestrand have helped us become market leader: already in 1948, the plant was the first in Europe to introduce the continuous strip-coating process and, as a result, assume technological leadership. Furthermore, our surface pretreatment is environmentally compatible, with no use made of chrome right from the beginning.

Safe transportation and storage



Road tankers, bulk transporters, tipping trucks, ships, boats and yachts all make use of the special properties of aluminium. Shipping containers, silos and storage tanks for the chemicals industry demand high functionality and corrosion resistance – requirements we meet easily with our know-how and the right alloy.

Strip and sheet, ranging in thickness from 4 to 12 mm, are produced in our Alunorf and Hamburg rolling mills for the construction of commercial vehicles and silos, as well as for shipbuilding applications. Europe's largest manufacturers of bulk transporters and road tankers place their trust in our special knowledge and approval certification of pressure vessels and hazardous material transporters, making us the market leader in Europe. Our particular advantage is that we meet the most exacting surface quality criteria and manufacturing tolerances, thereby guaranteeing optimum subsequent processing at our customers.

With innovative new alloys, we offer our customers tailored solutions for the increasingly stringent requirements of the future. Using our high-quality sheet, we can reduce the weight of a vehicle to a minimum without compromising its crash safety or the excellent formability of the material in any way.

The development of large, modern cruising liners and ever-faster yachts, ferries and patrol boats, in particular, has led to a constantly rising demand for high-performance materials. With our seawater-resistant aluminium alloys and state-of-the-art developments in corrosion protection, we have become the most important contact partner for the shipbuilding industry.

Our Research and Development Centre for Welding Technology as well as our laboratories for forming techniques and corrosion protection possess many years' experience and special knowledge in material-related matters. Here, specialists in cooperation with our customers are working on innovative solutions for the transport requirements of tomorrow.

Growing together: Our customer services

One of our most important tasks is to exploit the potential of aluminium and open up new areas of application. In this way, we are safeguarding a sustainable future and contributing to the business development of our customers and partners.

General Engineering has always placed great emphasis on service competence and customer orientation. We regard our customers as partners in a mutual growth process. This is confirmed by our high on-time delivery rate, reliable planning predictability and the guaranteed quality of our products. We provide consultancy services in all matters relating to aluminium, its application and special fabrication requirements.

Whether large-scale industry or medium-sized company, personal contact, rapid reaction times and the precise fulfilment of individual requirements are all part of our service package. Backed by advice, instruction and know-how from its network of application engineers and researchers, General Engineering not only offers its customers an extensive range of services but also the opportunity to broaden their knowledge base.

We optimise products, alloys and manufacturing processes in collaboration with our customers. Such close cooperation fosters long-term, trusting partnerships, which in turn make further innovations possible. In this way, we open up new markets and create business opportunities for all concerned.

Comprehensive technical and commercial services round off General Engineering's customer service programme. Other offerings, such as a special key account programme, an internet-based customer portal and individual recycling concepts, underline this partnership approach. Our firm conviction is: "We are at our strongest together".

We at Hydro conduct our daily business in accordance with our core values – respect, cooperation, foresight, determination and courage. Being orientated towards our customers' wishes and requirements is a matter of course for us and part of our fundamental belief in having honest dealings with one another.

Research and development – for the products of today and tomorrow

Our concentration on innovation, quality and cost-efficient solutions has seen us become the front-runner in numerous market segments. Our committed scientists in Research and Development and the efforts of all other employees have contributed to this success. Through our continuous improvement processes, fresh impetus is given to the intelligent and efficient use of aluminium day after day.

General Engineering attaches great importance to exploiting the potential of aluminium to the full. For innovative and sustainable solutions, we make use of Hydro's worldwide network which can call on 85 years' experience in the entire production chain. Our engineers, product developers and scientists maintain a constant exchange of information and help define state-of-the-art technology.

Our researchers not only carry out fundamental investigations into the material and its subsequent processing but also foster the development of innovative solutions. We support our customers' processes by offering a special program for the optimisation of welding in commercial vehicle manufacture. Specialised centres dedicated to forming and rolling techniques, mechanical and chemical surface treatment as well as corrosion protection, ensure that our know-how is up to date and our technology remains leading edge.

Close cooperation with our customers and partners as well as excellent market knowledge are particularly important to us. New methods and applications – characterised by high efficiency and improved properties – thus come directly from industrial practice.

Our cooperation with and frequent guest lectures at universities also heighten the next generation's fascination with aluminium and its extensive range of applications. Consequently, aluminium will deliver even more in the future.

Team players with individual strengths: Our rolling mills

General Engineering makes use of five rolling mills in Hydro's network, all optimally linked to one another with regard to logistics. Each mill specialises in certain alloys, products and processes. In this way, we are able to benefit from the specific strengths and know-how of each individual plant and achieve maximum quality, promptness and flexibility for our customers.

Holmestrand

The Holmestrand rolling mill in Norway produces 95,000 tonnes of rolled products per year exclusively from recycled material. This unique recycling concept allows us to offer our customers products specially tailored to their individual application.

Our philosophy at Holmestrand is: "We do not sell alloys and tempers but material properties optimally tailored to the end product." The plant produces plain coils for roof and wall cladding, distance spacers for window systems as well as for laminated tubes and guttering.

On two coating lines with an annual capacity of around 40,000 tonnes, we produce continuous coated strip and sheet with a maximum thickness of 2 mm. These products are mainly destined for applications in building and construction, such as façade systems, ceiling panels, roller shutters and doors. We are particularly proud of our environmentally compatible, chromium-free coil pretreatment process.

To ensure that the best-possible quality is offered to our customers every time, we make the most of the possibilities offered by the General Engineering interlinked system and this coil coating line. We therefore coat strip from the Holmestrand, Karmøy or Hamburg rolling mills in accordance with the required material properties.

Hamburg

Extensive investment and modernisation at the Hamburg plant have led to a capacity increase of almost 200,000 tonnes of rolled products. Reroll stock is now supplied to other plants in the General Engineering interlinked system, such as Holmestrand and Slim.

Hamburg specialises in standard rolled products for the stockholding trade as well as strip and sheet for end consumers with particular requirements regarding formability. Here too, the stringent requirements for pressure vessels are guaranteed through appropriate approval certification. The specific strength of the plant is its high-strength alloys of the 5xxx series. A wide range of thicknesses, from 0.080 mm to 12 mm, is available for the manufacture of top-quality products.

Karmøy

The rolling mill in Karmøy, Norway, is one of the world's technological leaders in continuous strip casting. Compared with hot-rolled strip, material produced using this continuous process is characterised by enhanced properties with regard to strength, temperature stability and electrical conductivity.

The production line boasts a high degree of flexibility and is able to respond rapidly to individual wishes. The plant has a capacity of 75,000 tonnes per year and delivers alloys of the 1xxx and 3xxx series.

From Karmøy, General Engineering mainly supplies its customers with standard sheet and coils made of alloys 1050 and 3003, coils of Hydro's proprietary alloy Hydec 1070 for making transformers, and sends reroll stock to our Holmestrand rolling mill.

Slim

The Slim plant is located in Cisterna, Italy, approximately 60 kilometres south of Rome. With a capacity of 100,000 tonnes per year, it mainly supplies the local market: 80 per cent of its production is subsequently processed in Italy.

On completion of extensive investment to increase capacity and upgrade manufacturing technology, the Slim plant will augment the quality of its products. The plant is already well known for its flexibility. Our technical engineers in southern Europe have made many a project possible through their inventiveness and rapidity.

Besides the production of plain coils and sheet, the great strength of Slim lies in its speciality products. It is the only plant in Hydro's interlinked system to manufacture round blanks for pots and pans. Pretreated anodised sheet for the building industry and coils with a bright-surface finish for special applications also come from Italy.

Alunorf

Alunorf in Neuss, Germany, is the world's largest hot rolling mill with two production lines. Hydro holds a 50-per-cent interest in the plant. Around 1.4 million tonnes of hot-rolled strip and 950,000 tonnes of cold-rolled strip are manufactured on ultra-modern production equipment. Alunorf's products are characterised by extremely close manufacturing tolerances and excellent surface quality.

Around 30,000 tonnes of aluminium per year are processed for the General Engineering, most of it for applications in transport and storage. The plant is certified according to the latest standards, such as ISO/TS 16949, AD 2000 W/0 und PED 97/23/EU, and has thus met the essential prerequisites for the manufacture of high-quality, safe products for the pressure vessel and hazardous materials sectors.

Innovative products for a sustainable future

Environmental protection and sustainability are a part of Hydro's corporate culture. We do not want progress just for the sake of progress, because we are conscious of our responsibility towards the environment and people. This is shown in our efficient use of natural resources and in our consistently better, more cost-efficient and environmentally compatible products.

Environmental protection is firmly anchored in the corporate policy of Hydro, along with our distinct flair for optimising potential and opening up new fields of application with sustainable solutions made of aluminium.

Since we are fully conversant with the entire lifecycle of our products, we strive to ensure that the most effective and environmentally compatible use of aluminium is made. We achieve reference values at Hydro Aluminium which confirm that we are making full use of the properties and energy-saving possibilities of the material. In cooperation with our customers from the transport, building and consumer durables industries, we are actively engaged in all parts of the value-adding chain and develop products which make life easier and reduce environmental impact.

This is clearly shown in our extensive product range: General Engineering, in cooperation with manufacturers of roof and wall systems have developed products which lead to more energy savings in building. At the same time, aluminium's decorative appearance ensures a pleasant living environment. In the commercial vehicles sector, we are working on the development of components that will reduce weight further, make vehicles even safer and cut fuel consumption.

New methods and equipment as well as increasing productivity in our plants and those of our customers are all parts of our key goal to optimise manufacturing processes. Higher performance efficiency makes an essential contribution towards reducing the environmental burden. Our rolling mills are all equipped with the most modern technology for air purification and for the recovery of the rolling oils employed.

We have developed a convincing concept for recyclable products and aluminium scrap from manufacturing operations. Our Holmestrand plant, for example, specialises in the production of strip and sheet exclusively from recycled material. A decisive advantage here is that aluminium which needs only five per cent of the original energy requirement is available for making new products. In addition, innovative materials with unique properties have been developed on the basis of this recycled metal.

Our passion for aluminium grows every day as new products to protect the environment are created.

Hydro Aluminium as
Rolled Products / Business Unit Strip
Product Area General Engineering
Drammensveien 264
0240 Oslo
Norway
www.hydro.com

3,000 | 8 | 2004