

NON-FERROUS METAL

INNOVATIVE HEAT TREATMENT
ENHANCES ENERGY EFFICIENCY

By means of innovative heat treatment, Alunorf is able to decrease the energy demand by approx. 31,000 MWh per annum. EFA's financing experts assist the realisation of the innovative measure.

The Aluminium Norf GmbH in Neuss is one of the largest aluminium smelting plants and rolling mills worldwide. The sales volume amounts to approx. 1.5 million tons per annum.

THE COMPANY

ALUNORF

ADDRESS

Aluminium Norf GmbH
Koblenzer Strasse 120, 41468 Neuss

INTERNET

www.alunorf.de

ESTABLISHED

1965

LINE OF BUSINESS

semi-finished and primary products made of aluminium and aluminium alloys

EMPLOYEES

approx. 2,200

INITIAL SITUATION

The Aluminium Norf GmbH (Alunorf) is one of the largest aluminium smelting plants and rolling mills worldwide. The semi-finished and primary products which are made in Neuss are used – among other things – for food packages and vehicle components. According to customer requirements, the plant produces aluminium strips in different material thicknesses, diameters and strip lengths. In the cold rolling process the strips heat up to 190°C. In order to achieve the desired metallurgical properties,

the rolled strips are heat-treated in an annealing furnace at 480°C at the end of the process. The heat already introduced into the strips through the rolling process was not able to be used for the heat treatment by the system which existed until 2011. The strips needed to cool down below 60°C prior to the heat treatment in order to provide process-reliable conditions for the existing time and temperature programmes for the entire furnace chamber.

Saving resources. Strengthening the economy.

MEASURES AND ADVANTAGES

In 2011 Alunorf realized an innovative furnace concept consisting of an energy-efficient furnace group with five units in which the thermal state of every single strip can be controlled online, in order to utilize the residual heat of the strips for the heat treatment. The furnaces have a 4-single-zone control with an online process control which allows the individual annealing of four single coils. This makes it possible to record and control the coil temperatures during the entire annealing process online. For the first time, hot coils can directly be heat-treated by means of this new technology. Thus, the residual heat from the rolling process can be utilized in the annealing furnaces.

Furthermore, Alunorf uses the hot furnace exhaust gases to preheat the protective gases utilized in the furnace chamber which also saves energy. Also, the internal logistics could be improved leading to shorter processing and machining time.

The innovative heat treatment facility amounts to overall energy savings of 45 percent a year compared with the old facility, an equivalent of approx. 31,000 MWh annually. In this way, a CO₂ equivalent of about 8,500 tons at an annual production of 180,000 tons can be avoided.

Due to the innovative approach and the achieved savings, the implemented measure has a best practice character for metal-working companies which operate multi-stage and interlinked processes with integrated heat treatment processes.



Charging machines can bring four coils at any time into the new furnace.

RESOURCE EFFECTS AT A GLANCE

Energy savings	approx. 31.000 MWh/a
CO ₂ equivalents	approx. 8.500 t/a

THE WAY TO FINANCING

In the run-up to the implementation, Alunorf benefited from the financial advice provided by EFA in July 2010 and recommended by the Energie-Agentur NRW. After careful consideration of the planned measure, the company created a project sketch for the environmental innovation programme of the Federal ministry for the Environment with the assistance of the EFA. The project was subsidised with funds from the environmen-

tal innovation programme of the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety worth € 1.5 million. After the approval of the subsidy in January 2011, EFA was assigned with the creation of the final report as well as the coordination of the measuring programme in August 2012. In December 2013 the project was finished. Alunorf invested approx. € 7.5 million altogether in the new heat treatment.

The project partners

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