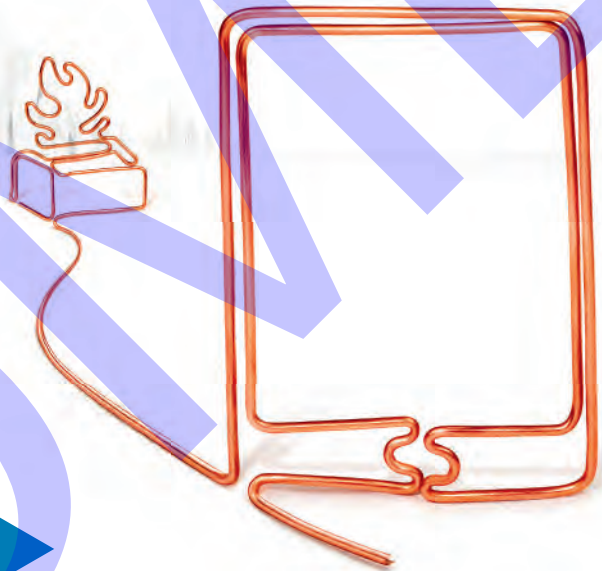


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Performance upgrade and process optimization

Vertical furnace optimized by OTTO JUNKER

Born, G., Schmitz, K. (1)

In close cooperation between the engineering and maintenance department at Aurubis Zutphen and OTTO JUNKER, a concept was developed to replace the existing horizontal pre-heating zone with two additional vertical heating zones.

Aurubis Netherlands B.V. in Zutphen is one of four production sites of the Aurubis group's Flat Rolled Products division.

In Zutphen, 330 employees fabricate a wide range of rolled products made from copper and copper alloys with a current finished capacity of 50,000 tonnes p.a. Strip with a thickness of up to 3 mm is annealed at approx. 800°C in two vertical furnaces. Years ago, to improve perform-

ance, a radiation-heated zone was built into one of the furnaces to pre-heat the strip fed horizontally through this area. After leaving this pre-heating zone, the strip was then guided over several rollers into the vertical furnace.

In close cooperation between the engineering and maintenance department at Aurubis Zutphen and OTTO JUNKER, a concept was developed to replace the existing horizontal pre-heating zone with two additional vertical heating zones. Particularly the deflection rollers used to guide the hot strip into the vertical furnaces were the cause of recurring

quality problems due to scratches, as well as high maintenance costs. Despite making various improvements, such as special surface coatings or drives, these problems could never be avoided completely.

In addition, Aurubis wanted a strip clamping feature to reliably retain the strip above the furnace and prevent it from falling back into the accumulator structure in case of strip breakage.

A further challenge was the extremely tight schedule: from signing the contract up to delivery, only five and a half months were available to design, produce and deliver the solution!

To minimize production downtime, a short time frame of less than three weeks was planned for the actual installation and commissioning phases. Within this short space of time, the old furnace had to be dismantled and the new furnace, complete with new system components and new steel platform, installed and put into operation.

OTTO JUNKER supplied two completely new furnace zones designed as high convection zones fitted with the companies nozzle system. The upper section of the furnace was also sealed with a new entry lock chamber. Finally, the new strip-guiding devices, such as deflection roll-

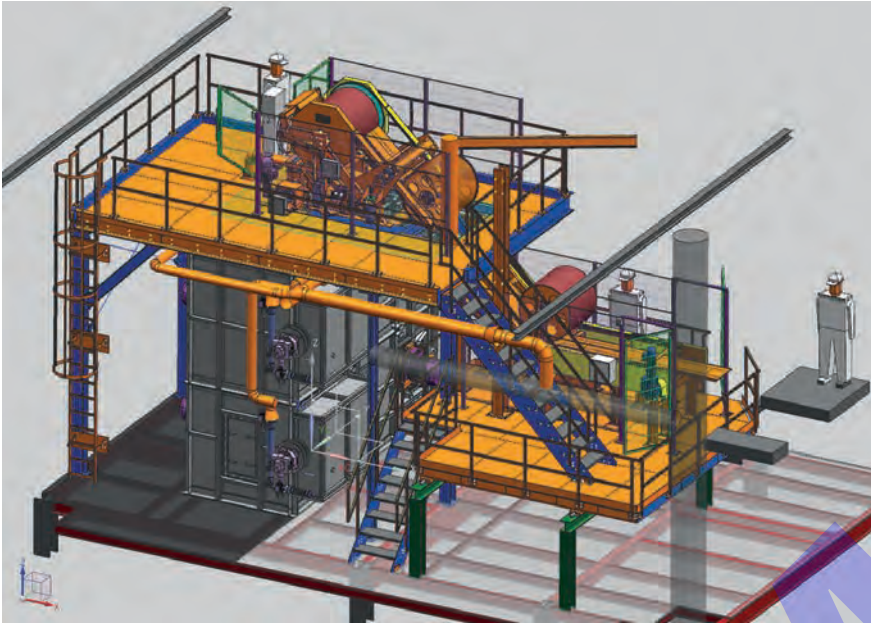


photos: Otto Junker

Installation of the furnace

Aurubis AG

is a leading global supplier of non-ferrous metals and the world's largest copper recycler. The company processes complex metal concentrates, scrap metal and metal-bearing recycling materials to create top quality metals. The company's core business is processing and efficiently recovering complex qualities of concentrates and recycling materials. The services provided by Aurubis place it firmly among the leaders in the industry. The company group aims at growth, efficiency and sustainability: the key elements of its business strategy include consolidating its leading position in the market as an integrated copper manufacturer, exploiting new markets in future industries, the highly-efficient and optimal extraction of other metals and by-products from complex raw materials, as well as a responsible attitude towards people, resources and the environment. Annually, Aurubis produces more than 1 million tons of copper cathodes and diverse copper products made from them, such as cast rods, continuous cast formats, rolled products, strips, as well as specialty wires and profiles made from copper and copper alloys. The product portfolio also includes precious metals, selenium, lead, nickel and a range of other products, such as sulfuric acid and iron silicate. The company employs around 6,500 staff, has production sites in Europe and the USA, as well as a vast service and sales system for copper products in Europe, Asia and North America. Aurubis customers include companies from the semi-finished product industry, the electrical, electronics and chemical industries, as well as suppliers for the renewable energies, construction and automotive industries. Aurubis shares are in the prime standard segment of the German stock exchange and are listed on the MDAX, Global Challenges Index (GCX) and Stoxx Europe 600.



Schematic of the installation

ers and the above-mentioned retaining mechanism, needed to be installed.

Right on time, the first coil was produced on the agreed production date. As time progressed, the various line parameters were adjusted, enabling production capacities for some alloys to be increased by up to 15%!

The modification of this furnace is another excellent example of how major performance improvements can be achieved in existing furnaces when user's operating experience is closely intermeshed with OTTO JUNKER know-how.

(1) Dipl.-Ing. Georg Born, Dipl.-Ing. Klaus Schmitz, Vice President, Sales & Marketing Thermoprocessing Plants, Otto Junker GmbH