

COPPER

Process Technology



Pyrometallurgy based technology

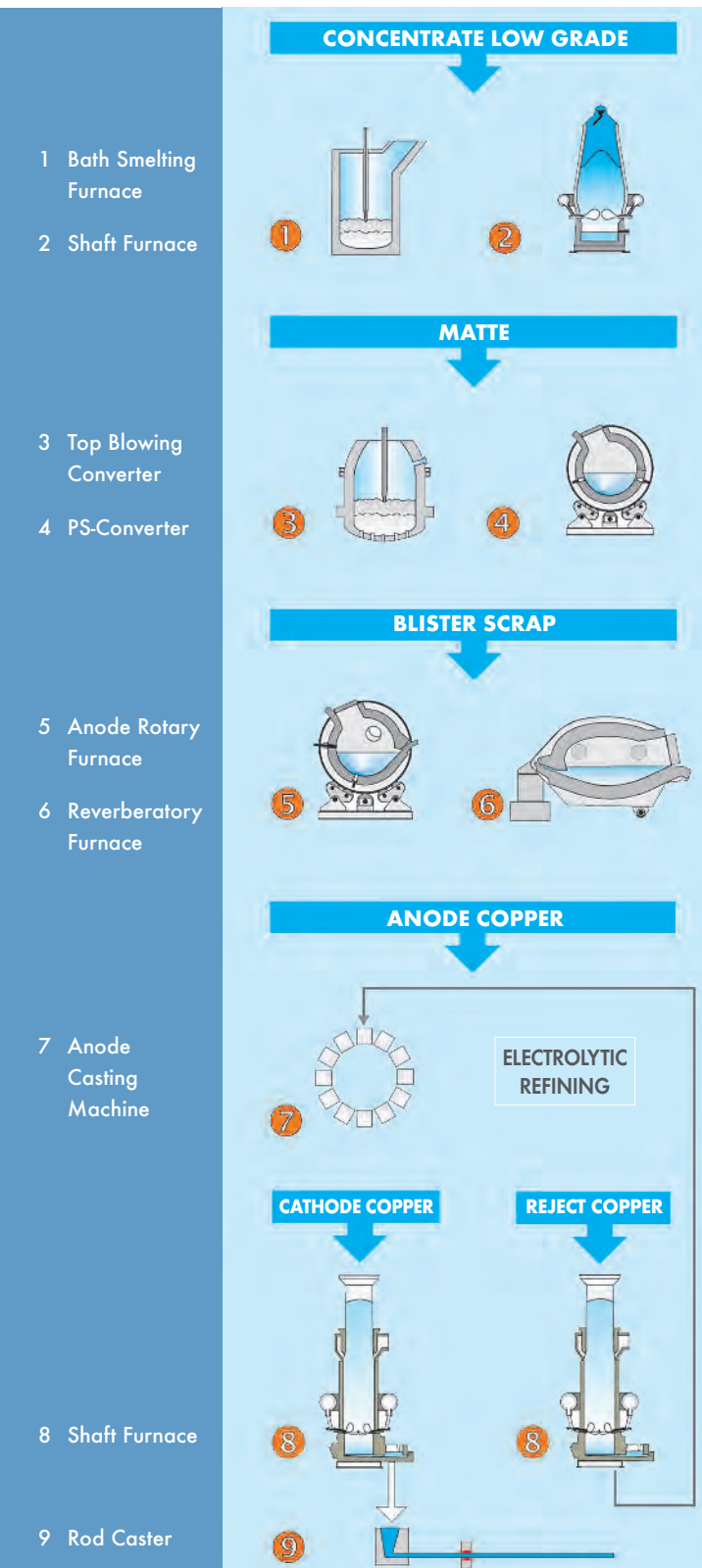
Recycling of low grade material

Processing to high quality products

Complete process plants

KÜTTNER

THE "FULL-LINE SUPPLIER" FOR THE NON-FERROUS METALS INDUSTRY



KÜTTNER Non Ferrous is an established "full-line supplier" for the primary as well as the secondary copper producing industry serving clients with complete system solutions out of one hand. With its long record of industrial installations the company covers all major processing steps in the respective metals industry.

The technologies are applied in all major plant areas in the non ferrous metals industry such as material handling, heat recovery, off-gas treatment and automation. In the field of pyrometallurgy for the copper industry KÜTTNER has developed specific know-how for low grade material smelting and converting, blister treatment, scrap recycling and processing of high quality products.

In addition to plants and systems KÜTTNER Non Ferrous offers Technology Packages for the improvement of process parameters in existing plants. Amongst others the following pyrometallurgical technology is provided by KÜTTNER Non Ferrous:

Bath Smelting Furnace for treatment of concentrate and low grade scrap.

Converter Furnace for the treatment of matte to blister copper.

Rotary Furnace for the refining of blister to anode copper and high quality products.

Scrap Refining Reverb Furnace for melting and refining of scrap to anode copper and high quality products.

Shaft Furnace for continuous re-melting of cathodes, anodes and low grade material.

The technology, products and services offered by KÜTTNER encompass a large part of the metals processing route and are marketed throughout the world.



EQUIPMENT FOR PYROMETALLURGICAL PROCESSES

Copper swarf batching



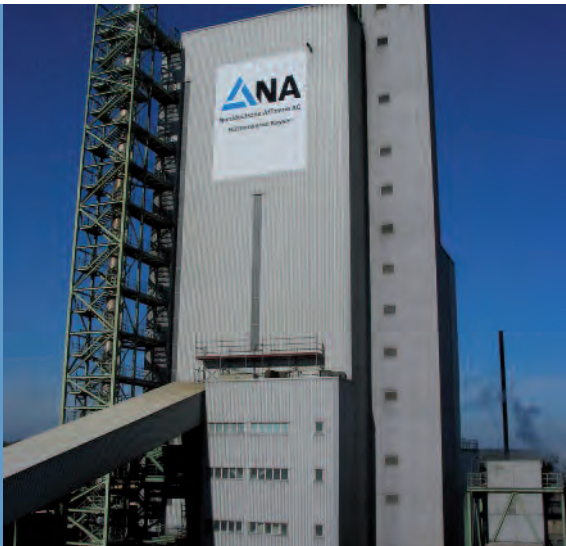
Material Handling

Complete systems and key components for material handling and preparation.

Applications:

- Conveyors for raw material transportation
- Bulk material storage and transport
- Pneumatic transport and injection
- Skip charging systems for raw material and scrap
- Automated additive charging system
- By-product treatment

AURUBIS - Lünen
Plant/Germany



Bath Smelting Furnace

Efficient top blowing bath-smelting furnace for the production of non-ferrous metals. This type of smelter finds its applications in the primary as well as in the secondary copper industry. Via a top lance gas/oil and air/oxygen are injected to achieve oxidizing and reducing operation. KÜTTNER has developed a lance design for quick change over.

Applications:

- Smelting of copper concentrate
- Smelting of low and high grade scrap
- Converting of copper matte



Converter furnace,
Umicore/Belgium



Converter Furnace

A furnace system applied in the primary and secondary copper industry mainly for the conversion of lower grade matte to blister copper in a discontinuous process by injection of oxidation media through a top lance or submerged nozzles.

Furnace types and applications:

- Top blowing converter – Smelting and converting of low and high grade scrap or matte
- PS-Converter – Converting of copper matte to blister copper
- Precious metals recycling



FROM LOW GRADE TO BLISTER TREATMENT AND CATHODE PROCESSING

Rotary Furnace

Pyrometallurgical, batch operating refining furnace applied in the primary and secondary copper industry, used for the production of anode copper quality from blister copper and the metallurgical treatment of high grade scrap to finished product. Metallurgical treatment is mainly done by means of suitable process supportive fluxes.

Applications:

- Anode furnace for the metallurgical treatment of blister to anode copper.
- Rotary refining furnace for melting and refining of high grade scrap to rod quality.
- Holding furnace in casting operations.
- Slag and metal separation.



Slag cleaning furnace at AURUBIS - Lünen Plant/Germany



Reverberatory Furnace

Batch operating tiltable reverb furnace for melting and refining of scrap to semi finished and high grade quality products. The reverb furnace finds its application mainly in the secondary copper industry for recycling of different scrap qualities. Melting is achieved by highly efficient side wall or roof burners; refining and metallurgical treatment is carried out by submerged nozzles.

Applications:

- Lower grade scrap to anode quality.
- Higher grade scrap to rod quality.



Scrap recycling furnace - greenfield study



Shaft Furnace

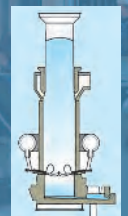
High performance continuous shaft melting furnace for re-melting of high grade copper cathodes, circulating scrap and residues. Products from the shaft furnace are fed into continuous casting lines or downstream metallurgical converting and refining furnaces. The different kinds of shaft furnaces are either operating on high velocity pre-mix burners or on industrial coke and hot blast.

Furnace types and applications:

- Cathode / Anode shaft melting furnace for melting cathodes, high grade scrap and rejected anodes for direct feeding into casting machines.
- Reaction shaft furnace - Melting of highly contaminated scrap or residues, e. g. bronze, brass, converter and anode furnace slag for production of copper.



Black copper shaft furnace MKM, Hettstedt/Germany



AUXILIARY EQUIPMENT

Off-gas Treatment

Various systems and equipment components for the treatment of plant off-gases and heat recovery.

Applications:

- Afterburning chambers and thermal steam boilers
- Quenching to avoid dioxin formation
- Bag house with additive injection
- Caustic soda washers for separation of HCl, SO₂ and HF
- Heat exchanger for waste heat recovery and preheating of process media



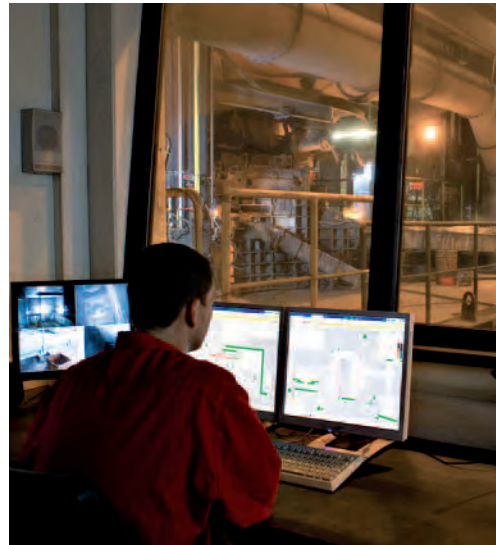
Hot blast generator
Umicore, Belgium

Process Automation

Technology to design innovative process automation and control systems for complete new production facilities as well as for upgrading existing operations.

Applications:

- Control panels and control systems
- Measuring systems and instrumentation
- Process control and automation systems
- Information management system (iIM) – Refining of relevant operational data.



HMI system in
central control
room

Technology Packages

Technology packages for improvement of process parameters in existing plants to achieve an increase in metallurgical/thermal efficiency and facility life cycle as well as reduction of process costs.

Improvement solutions:

- Feasibility studies, engineering and modelling
- Process investigation, consulting and supervision
- Charging doors and systems
- Purging, stirring
- Cooling elements..
- Combustion
- Off-gas hoods



Bath homo-
genization by
use of stirring
technology

KÜTTNER NON FERROUS GMBH

A subsidiary of Küttner GmbH & Co. KG

Established in 1949 by Dr. Carl Küttner, this engineering company has evolved into a globally active group of companies supplying turnkey plants for process, melting and conveying technology to the metals producing and processing industry.

KÜTTNER Non Ferrous is an internationally well established "Engineering and Contracting" partner for complete production facilities in the non-ferrous metals industry. Based on extensive experience in the relevant field KÜTTNER Non Ferrous is able to supply customer-tailored

plant systems including material handling, pyrometallurgical process technology, heat recovery, off-gas treatment and automation solutions.

The service offered comprises the engineering and design, construction, supply as well as erection and commissioning of plants.

The KÜTTNER Group today has a worldwide workforce of more than 500. It is represented in the international markets through a network of affiliated companies and agents. The owners actively work in the company.

