

# Copper smelter modernization



## Umicore Med in Pirdop, Bulgaria



### The Outokumpu partnership

As one of the world's leading developers and suppliers of technology, Outokumpu Technology designs and delivers plants, processes and equipment tailored to each customer's needs. We provide engineering, project and support services for the minerals processing and metallurgical industries globally.

### Modernization of the Pirdop Smelter

The Umicore Med smelter in Pirdop, Bulgaria was built in 1958, and first modernized in the 1980's when Outokumpu Flash Smelting technology was taken into use. At the turn of the 21st century the plant went through a major investment program in order to meet the EU's environmental standards and to improve production.

The modernization projects were executed in partnership with Outokumpu Technology in two phases. The first phase, during 1999, included refurbishment of the Flash Furnace and waste heat boiler.

The second phase of modernization and expansion started in 2001, on a lump-sum turn-key basis, with our German engineering unit (former Lurgi Metallurgie). The scope of our supply covered new dryers and the refurbishment of the existing dry electrostatic precipitators as well as upgrading the converters and the existing gas cleaning systems. In addition, a new sulphuric acid line was constructed.

## Highlights of the project

### • Material handling

Material flow from the existing concentrate bins upstream from the dryers was improved. Bins for silica and reverts were equipped with wear-resistant linings. The capacity of the existing pneumatic concentrate feeder was adapted to meet the new requirements.

### • Concentrate drying

The existing dryers were replaced with two new steam dryers. Emissions were significantly cut by employing bag filters and indirect steam-drying at lower temperatures.

### • Flash Furnace

A dual unit Loss In Weight concentrate feed system and a new single jet burner were installed. The water cooling system was upgraded and the furnace re-lined.

### • Converting

The original contract covered new primary and secondary hoods for the existing Peirce-Smith converters. During the project, the contract was extended to supply larger converters with new blowers and punching machines.

The first converter was replaced with a new larger unit. Its shell was refurbished and extended, and used for replacing the other converters. This made it possible to install increased converting capacity during normal shutdowns.



3039EN\_Lipis, Helsinki, Finland, February 2005.

### • Gas handling

The radiation and convection sections of the Flash Furnace waste heat boiler were completely rebuilt. The existing electrostatic precipitators of the smelting furnace and converters were each extended by one additional field. Two new evaporative cooling towers were installed to cool down the off-gases from the converters.

In order to ensure optimization of converter gas collection and proper interaction with the sulphuric acid plants, a Converter Control System with Batch Level Determination was installed.

### • Acid plant

The existing gas washing and cooling facilities were enlarged. In addition, a new sulphuric acid plant with a production capacity of 1,950 tpd was installed.

## Features of the project

- In the first phase, Outokumpu delivered a technology transfer package for the Flash Smelting furnace including engineering, supply of key equipment and supervision services
- The second phase of the modernization project was executed on a lump-sum turn-key basis. The value of the contract was 71.5 million Euros
- The refurbishment was carried out with minimum shutdowns
- Mechanical completion deadlines for the second phase:
  - Dryer area within 18-19 months
  - Refurbishment of electrostatic precipitators within 16 months
  - Converters within 16, 17 and 19 months
  - Off-gas handling within 16 months
  - Acid plant within 23 months

*Outokumpu is a dynamic metals and technology group. Customers in a wide range of industries use our metal products, technology and services worldwide. We help our customers to gain a competitive advantage by enhancing their performance. We call this the Outokumpu factor.*

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E-mail: [info.technology@outokumpu.com](mailto:info.technology@outokumpu.com)

[www.outokumpu.com](http://www.outokumpu.com)