

Short Description of Aurubis Process Technology

In the **primary copper smelter** copper anodes (copper content approx. 99 %) are produced from copper ore concentrates in a multi-stage pyrometallurgical process. In each process stage recycling materials can be used for the recovery of the metals contained. Copper cathodes with a copper content of more than 99.99 % are produced electrochemically from the copper anodes in the copper tankhouse. The cathodes are used for the production of continuous cast wire rod, shapes and metal powder.

The iron contained in the concentrates and recycling materials is recovered by adding **silicate containing materials** (sand or other SiO_2 containing materials, display screen glass) in the form of iron silicate stone. This is processed to quality assured **construction materials** for paths, roads and river embankments as well as to **mineral abrasives**.

Apart from Aurubis's own intermediary products (flue dust, slag, slimes) the intermediary products from other smelters along with industrial recycling materials and wastes are treated in the **secondary smelter**, in order to recover the valuable metals contained (in particular Cu, Pb, Ni and precious metals). The copper and lead matrix produced is further processed in the following pyrometallurgical and hydrometallurgical plants to separate the other metals contained (gold, silver, nickel, bismuth, arsenic, antimony, selenium, tellurium, tin, zinc). These metals contained in the feed materials are further enriched in order that they may be marketed as saleable metals (Pb, Ag, Au, Se), alloys (Bi) or chemical compounds (e.g. NiSO_4 , As_2O_3 , Na_2TeO_3 , ZnO). Sulphur dioxide-bearing process gases from the primary and secondary smelters are dedusted and then cleaned in a multi-stage process. Finally the SO_2 is converted to sulphuric acid and oleum, two saleable products, in the double absorption contact acid plants. The off-gases from the melting and refining processes are treated in special off-gas cleaning plants, any waste water arising is treated in state-of-the-art waste water treatment plants.

Internal intermediary products and bought recycling materials, which are rich in **precious metals**, are processed to recover their precious metals. Above all, anode slimes from Aurubis's own and foreign copper tankhouses as well as precious metal-bearing skimmings and sulphur-bearing bullion are utilised in the top blown rotary converter I. The SO_2 - and SeO_2 -containing off-gases are cleaned in an off-gas scrubber and the SO_2 is processed to sulphuric acid in the double absorption acid plants. The selenium is extracted as wet selenium. Raw materials low in sulphur and selenium, which are largely types of bullion rich in precious metals, are fed into the top blown rotary converter II, refined and finally processed to silver bars or silver anodes for the precious metal refinery. The off-gas from the top blown rotary converter II is treated in an off-gas cleaning plant and emitted to atmosphere. The precious metals (silver, gold, platinum metals group) are selectively refined by hydrometallurgical processes to give market conform products.