APPLICATION

THE **TASK**

The production of copper - and particulary the melting of cupriferous ore - results in very demanding filtration tasks. Particularly in Asia/China, the admissible emission values are becoming increasingly stricter and thus both existing and new production facilities shall be equipped with effective filter systems.

Fig. 1: Copper smelting process

The essential key process in the manufacture of copper is the melting of copper ore. Nowadays, the proven flash smelting process is mainly used therefore. In this process so-called copper matte is extracted from the copper ore in an oven. For further processing this copper matte is continuously carried into a converter by means of a double flap gate. By blowing in air, two process steps are initiated in this converter. First, iron sulfide is roasted to iron oxide. The addition of quartz produces slag, containing iron, which is poured off. In the second step, existing Cu_2S oxidizes to Cu_2O. The resulting SO_2 is discharged as exhaust gas from the furnace. This process produces crude copper with a Cu content of 90 - 98 %, which can now be further processed by refining.

The processes around the chalcocite produce different emissions that have to be separated. In addition to dust, various hot gases such as sulfur dioxide have to be filtered to protect man, machine and the environment.

THE **SOLUTION**

Throughout the whole „copper matte handling process“ in the converter, extraction at multiple points is required. To ensure efficient filtration, the process is vacuumed here at a total of three different points. Right from the filling of the converter, emissions occur. Therefore, there is a first suction on the double flap for filling the chalcocite from the flash smelting furnace.

Fig. 2: Filter system Herding® FLEX

PROCESS // **COPPER PRODUCTION**

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Fig. 3: Herding® FLEX filter system

Fig.4: Raw gas housing with clean gas channel

THE **SOLUTION**

Another extraction point follows at the separation and thus the discharge of slag from the converter.

The freshly separated slag evaporates - resulting gases are efficiently separated by the filter system. After passing through the last process step, the anode furnace, molds are filled. Here, too, further extraction optimally supports the customer's production. The Herding® FLEX filter system ensures that the entire production process is best supported by effective filtration.

Fig. 5: Herding® Sinter-Plate Filter

After the 450 tons filter unit the secondary stage activated carbon filter is installed. The process flow of the converter produces sulfur dioxide. This is bound in the activated carbon filter by moving activated carbon. The abrasion of this deposit is also filtered from the air flow. The Herding FLEX filter system is now used for this purpose. All emissions from the manufacturing process are filtered and separated on a filter surface of around 13,000 m². Due to the high demand regarding the air flow, a Herding FLEX filter system was chosen. This offers optimum conditions and was designed for an air flow of 800,000 m³/h.

The extremely high separation efficiency of the installed Herding® Sinter-Plate filter elements assures a safe and sustainable compliance with the regulations for clean gas dust emissions. The Jet-Pulse cleaning system for the filter elements works on minimized compressed air consumption due to the use of high-efficient solenoid valves in combination with a consumption-optimized cleaning logic.

THE **ADVANTAGES** USING Herding® SINTER-PLATE FILTERS

- Pure surface filtration provides constant operating conditions
- Extremely low clean gas dust emission rates for safe compliance with current and future limit values
- High relative filter surface area allows for a compact design of the filter units
- Low maintenance costs due to rigid filter medium (no flexing and no wear)
- Long service lives result in low maintenance costs
- Quick installation on-site

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