


# Water Treatment Plant

Hot Rolling Mill EKO – Stahl

Eisenhüttenstadt  
Germany

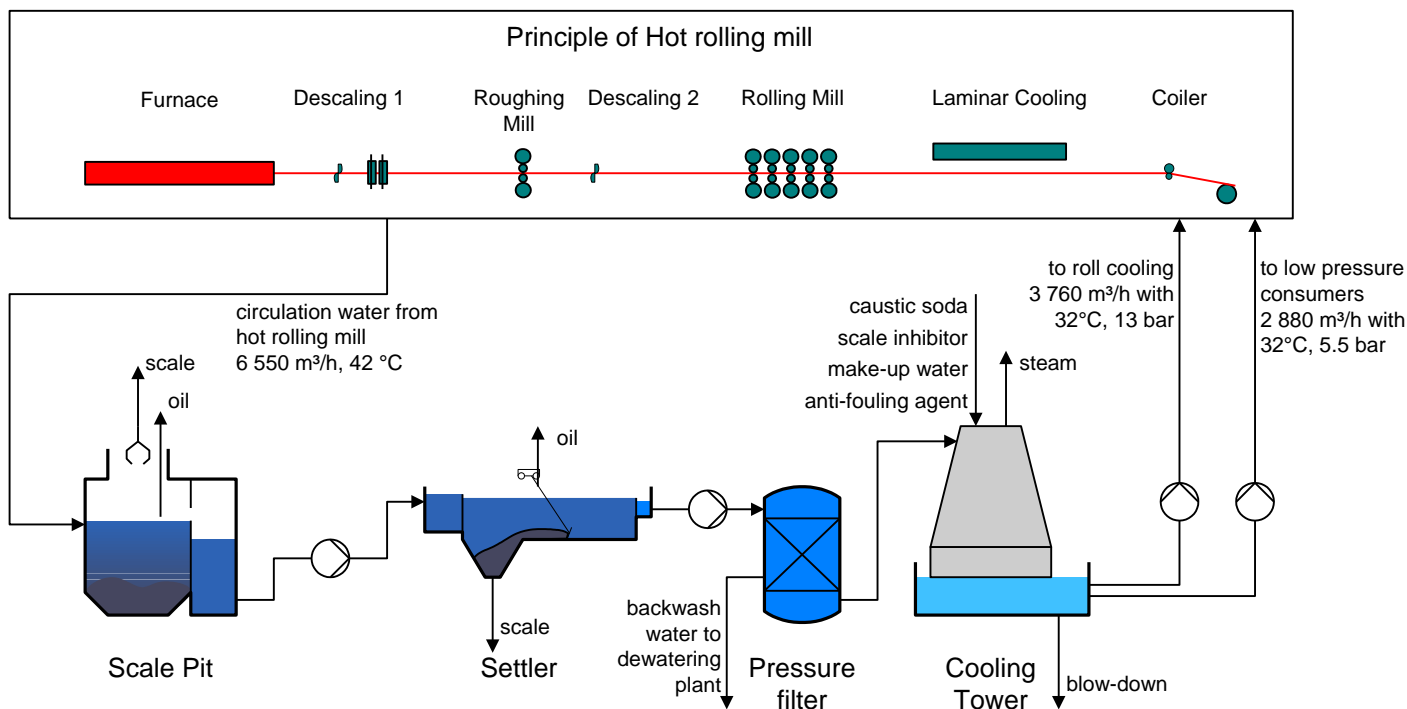


In 1996 Lurgi Bamag received the contract for a turnkey Water Treatment Plant at a hot rolling mill in Eisenhüttenstadt, Germany. The annual capacity of the mill is 1,500,000 metric tons of steel. Water for the mill is obtained from a nearby lake and is supplied through intake filters. Wastewater is treated before being discharged to a river. The Water Treatment Plant is divided into three separate circuits, each equipped to meet the specific requirements of the water use.



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## 1. Objective

Treatment of hot rolling mill process water

### - Design data

Throughput	1 <sup>st</sup> circuit	1,770 m <sup>3</sup> /h
	2 <sup>nd</sup> circuit	6,000 m <sup>3</sup> /h
	3 <sup>rd</sup> circuit	6,550 m <sup>3</sup> /h

## 2. Plant concept

The three circuits and process layout are:

### - 1. Closed Circuit

Closed-circuit cooling water supply for equipment cooling, consisting of: plate-type heat exchanger and secondary-circuit induced-draft cooling tower, circulating pumps and chemical feed to cooling tower and closed circuit.

### - 2. Laminar Cooling Circuit

Open-circuit cooling water supply for direct laminar-flow product cooling, consisting of rectangular sedimentation basin with oil removal, pressure filters, induced-draft cooling tower, chemical feed to cooling tower and open circuit and pumping stations.

### - 3. Direct Open Circuit

Open-circuit water supply for direct cooling at low pressure consumption points and rolling stand, consisting of scale pit with oil removal, rectangular sedimentation basin with oil removal, pressure filters, induced-draft cooling tower, chemical feed to the cooling tower and the open circuit and pumping stations.

## 3. Special process features

Mill scale removed from the water in the scale pit and sedimentation basin is recovered by overhead travelling crane and recycled to the blast furnace. The scale pit is an approved special Lurgi Bamag design installed in more than 50 previous projects.

The pressure filters are fitted with nozzle-less filter bottoms and have given reliable performance in over 600 applications around the world. Chemical treatment involves addition of the appropriate agents to the separate circuits for inhibiting water scale formation and corrosion, controlling slime and promoting flocculation.

The treatment plant is operated by an automatic process control system located in the mill central control room.

## 4. Waste Water Treatment

Backwash water from the pressure filters is combined with the wastewater from the steel mill and treated in a separate plant to reduce the COD from 900 mg/l down to below 40 mg/l.

Wastewater is routed through a pre-reaction chamber, in which flocculant is added, to a compact SEDIMAT clariflocculator. There polyelectrolyte is added to promote settling of suspended solids.

A proportion of the settled sludge is returned to the reaction zone as contact sludge.

Most of the clear water is recycled to the 3<sup>rd</sup> Circuit as cooling water while 10 % of the flow is combined with effluent from the sludge dewatering centrifuge and pumped to a separate system for biological treatment.

The Sludge withdrawn from the SEDIMAT clariflocculator is collected in a tank and dewatered by centrifuge, producing a sludge cake with a dry solids content over 60%.