

Water management system for steel mills

Mittal Steel Poland S.A.

2-line continuous slab casting plant
Kattowice / Poland



Mittal Steel S.A. awarded BAMAG the contract for the construction of the water management system for its continuous slab casting plant in Kattowice/ Poland.

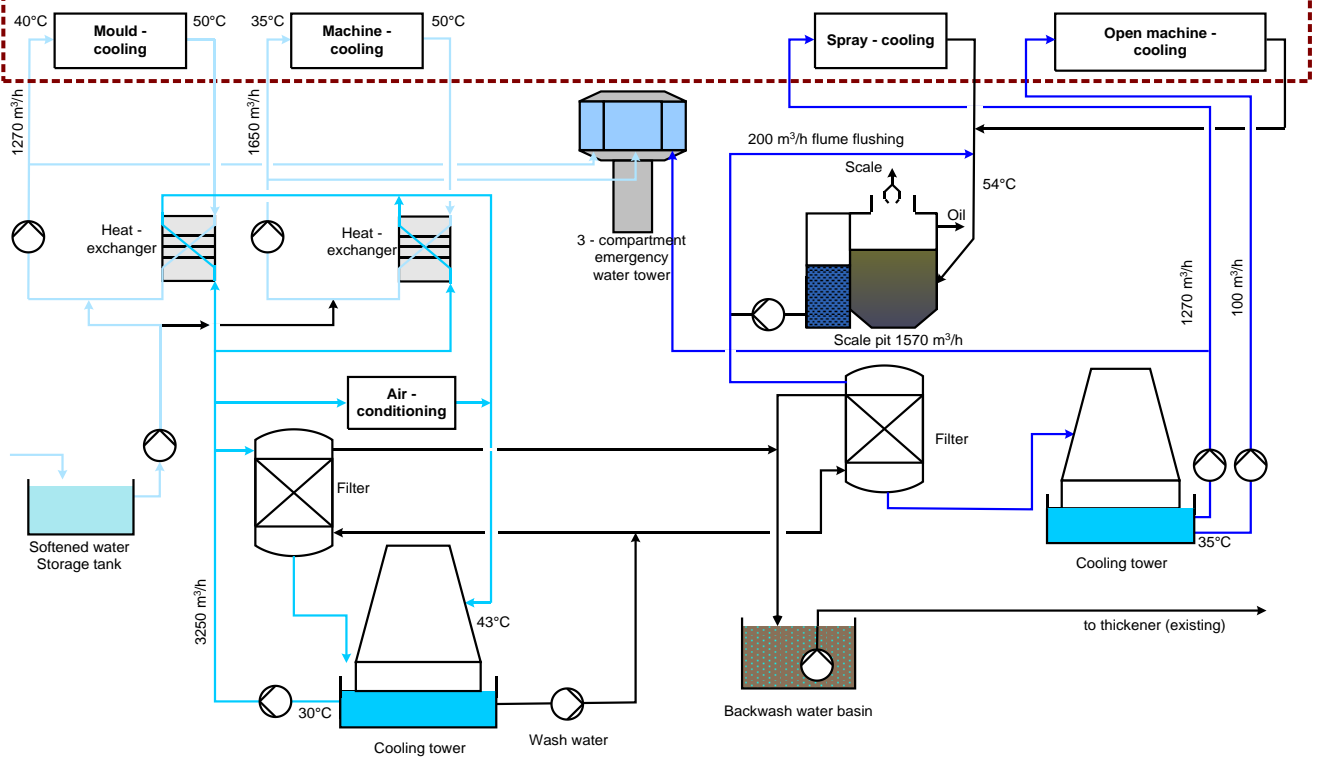
The water management system is designed to treat a total throughput of approx. 7,500 m³/h of four separate cooling water circuits, allowing 100 % recirculation of the cooling water of the new continuous slab casting plant.

The slab caster is designed for an output of 3 million tons of steel per annum. The cooling water is supplied by existing systems; the waste water generated is treated in existing systems before being discharged to the receiving water.

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... the experts

2-line continuous slab casting plant



The unit processes provided for by the water management system include scale and oil separation followed by sedimentation, filtration and recooling of the water of the various cooling circuits.

1. Objective

Complete water management system for a continuous slab casting plant.
Design data of individual cooling circuits

Throughput:

- Mould cooling system
1,270 m³/h closed
- Machine cooling system
1,650 m³/h closed
- Spray and open machine cooling system
1,370 m³/h open
- Secondary cooling system
3,250 m³/h open

2. Plant concept

The water management system comprises the following individual circuits:

- Mould cooling system: indirect cooling

Closed indirect cooling circuit for mould cooling consisting of side-stream filtration unit, heat exchangers, circulation pumps and chemicals dosage station.

- Machine cooling system: indirect cooling

Closed indirect cooling circuit for machine cooling consisting of side-stream filtration unit, heat exchanger circulation pumps and chemicals dosage station.

- Spray and open machine cooling system: direct cooling

Open direct cooling circuit for spray cooling and open machine cooling consisting of scale pit with integrated

oil separator, pump station, pressure filter system for scale and oil removal, forced-draft cooling tower, circulation pumps and chemical dosing station.

- Secondary cooling system

Open cooling circuit to recool the closed mould and machine cooling circuits, consisting of cooling tower, circulation pumps, pressurized side-stream filter and chemicals dosage station.

3. Special process features

The scale collecting in the scale pit is removed by a travelling crane and returned to the blast furnace process. The BAMAG scale pit design has proved itself in more than 50 plants successfully. The pressure filters are equipped with nozzleless filter bottoms (T-bottoms) which have demonstrated their outstanding reliability in over 800 filters worldwide. Water treatment chemicals are added to the various circuits to prevent hardness deposits, corrosion and biological fouling. System operation is automatically controlled and monitored by a PLC installed in the central control room.

4. Makeup

Water losses in the individual cooling circuits are compensated by adding makeup water from the existing systems.

The softened water required for the closed cooling water circuits is buffered in a tank from where it is added to the circuits via a pump station.

5. Emergency cooling

For emergency cooling of the two closed and the open cooling circuits, a three-compartment emergency water tower designed for a total volume of approx. 420 m³ is provided.

6. Wastewater treatment

The backwash effluents of the pressure and side-stream filters are treated in an existing waste water treatment system.

The waste water generated is collected in a tank and transferred to waste water treatment by a pump station.

7. Operating experience

The complete project was implemented on a fast-track schedule. The system was commissioned only 15 months after contract award.