ENVIRONMENTAL TECHNOLOGY

DECEUNINCK - Hooglede

Selective ion exchange for the removal of metals from the cooling water

DECEUNINCK offers a broad spectrum of durable extruded PVC window and door systems and other building products. The company's specialties are compounding, building of moulds, design, development, extrusion, refinement, recycling and spray-mould of plastic window systems, profiles and sealings as well as wood composite applications for the building industry.

The profiles leaving the extruders are cooled down by a secondary cooling water circuit. The drain of this cooling water was discharged directly in the sewer.

More severe conditions in the discharge permit for e.g. lead and zinc (2 components which are present in compound stabilisators) required an additional treatment of the waste water.

First Trevi executed an orientating lab test to confirm feasibility of the selective ion exchange. An extensive pilot test followed to obtain and design optimal process conductions and implementation.

The treatment plant has a capacity of 5 m^3/h and reduces concentrations of lead and zinc far below discharge limits. Also the other discharge parameters are influenced positively.
The waste water from the secondary circuit is stored in a buffer tank. A small amount of acid is dosed to obtain the

Design capacity		
parameter	unit	design
flow	m^3/h	1 - 5
zinc removal	kg/year	> 8
lead removal	kg/year	> 7

Measured parameters			
parameter	unit	limit	effluent
lead	mg Pb/l	0,5	0,03
zinc	mg Zn/l	1,0	0,05

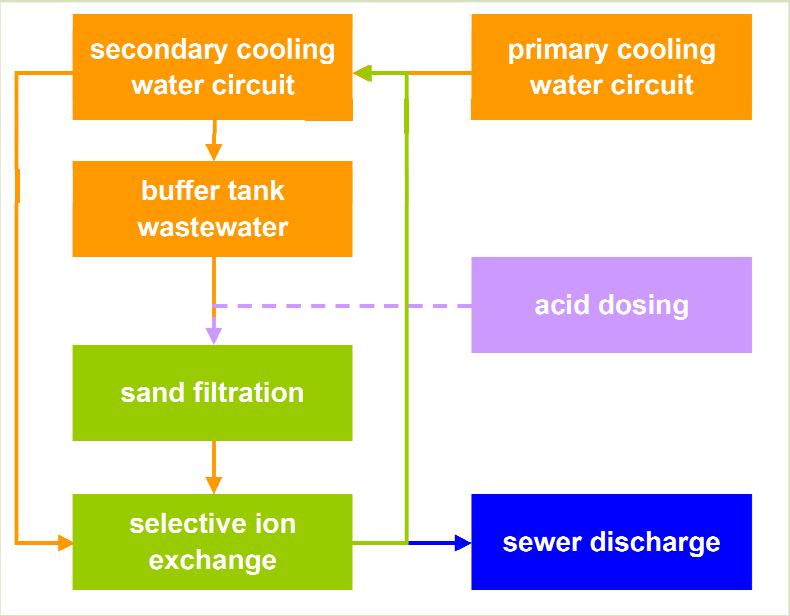
optimal pH. The sand filter avoids suspended solids, which can clog the ion exchange resins.

The ion exchange filter consists of 2 vessels containing a selective weak acid resin. Lead and zinc ions are exchanged for sodium ions.

At the moment an end-of-pipe treatment is applied before discharge. However, the design allows the treatment by ion exchange and the recycling in process of the water of as well the secondary as the primary cooling water circuit. By this the buffer tank, which is now rented, can be avoided, the quality of the circuit water will increase and the composition of the circuit water complies with discharge limits on any moment.

The water flows through both vessels in series. This makes it possible to replace the first filter at saturation point without process stop. Afterwards the new resins are operated as last filtration step. For the current process conditions one filter vessel resin content has to be replaced each year.

Pilot installation



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