

Munksjö Aspa Mill, Sweden

The Client

The Munksjö Aspa mill in Sweden produces 180,000 tons per year of bleached and unbleached kraft pulp. The production of the different pulp qualities (ECF, TCF and UKP pulp) takes place in campaigns, which results in a varying composition of the effluent process water. Most of the production is ECF pulp, which is produced during production periods of 4-8 weeks, with periods of 2-4 weeks of TCF and UKP production in between.



The Client's Needs

To meet new discharge limits with a low-cost biological process.

Before the introduction of a biological process, the wastewater treatment at the mill consisted of gravity clarification only. When new regulations resulted in the need for additional treatment to reduce the discharge of organic matter, an internal audit was done to come up with a few options. One of the most interesting ones was biological treatment of the filtrate from the chlorine dioxide bleaching during production of ECF pulp.

The Solution

A thermophilic AnoxKaldnes Natrix™ biofilm process was selected for the project.



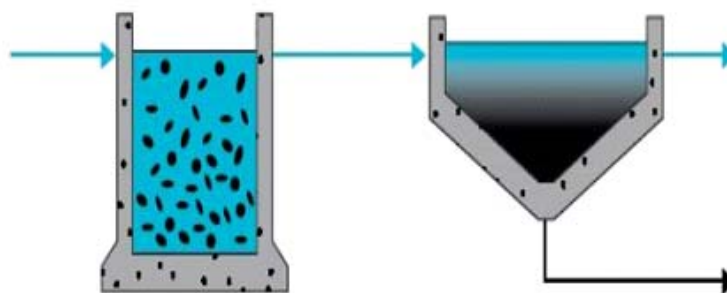
Concept & Design

Since cost was an important factor, different options including using existing tanks and minimizing operating cost were considered. The final solution was to use one of the available tank volumes in the mill, an old bleaching tower, and convert it to a biological treatment process. If this process could be operated at a high temperature the trouble and expense of cooling would also be minimized.

An existing bleaching tower with a wet volume of 85 m³ was converted to a Natrix™ biofilm process through the installation of a coarse grid aeration system at the bottom of the tower and of an outlet sieve to keep the carrier media in the reactor. The reactor is filled to 50 % with BiofilmChip™ M carrier with a large surface area. The flow is around 4,300 m³/d (1.14 MGD) resulting in a hydraulic retention time (HRT) of 30 minutes. The organic load varies between 15 and 30 kg TOC/m³*d. The temperature is decreased from about 65 °C in the influent bleach filtrate to 57-59 °C in the bioprocess. Neutralization is done by addition of oxidized white liquor. Nutrients are dosed as phosphoric acid and ammonium sulfate.

Results

- The temperature varies between 57 and 59 °C.
- Removal of TOC is often 30-35 %, but the removal is most often limited by the nutrient dosage.
- Removal of BOD7 is 40-50 %.



Schematic overview of the treatment