

Valdivia Paper Mill, Chile

A Case Study

Case Study: Pulp & Paper Industry
Start Up: August 2006
Capacity: 8,500 m³/d



Overview

The paper mill at Valdivia produces card board from chemical and mechanical pulp. With the installation of an additional paper machine, the wastewater flow increased from 4,000 m³/d to 8,500 m³/d and therefore an extension of the existing wastewater treatment plant was required.

Requirement

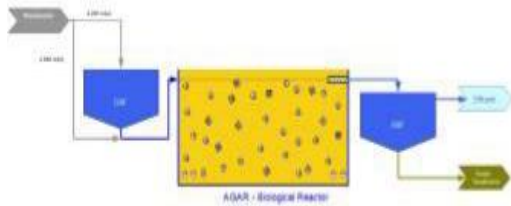
So far, the existing effluent treatment plant consisted of a primary treatment (DAF) and a sludge dewatering unit (belt press) for the treatment of 4,000 m³/d wastewater. Due to the installation of an additional paper machine, the daily wastewater flow increased to 8,500 m³/d. In order to comply with discharge requirements, the installation of a secondary treatment became necessary. The complete plant shall achieve effluent TSS and BOD concentration of less than 300 mg/l with the opportunity for a future upgrade to effluent BOD concentration of less than 35 mg/l.

Solution

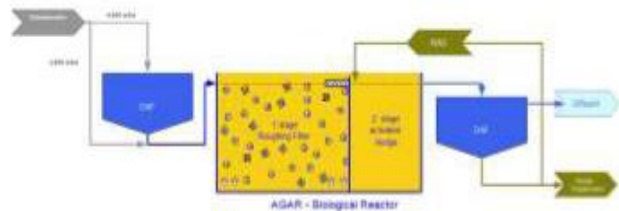
Paper mill effluent is a high strength wastewater. Therefore, an AGAR MBBR system, which utilizes attached biofilm for intense BOD removal and without the need of sludge recirculation, was installed. For the future upgrade of the plant, the MBBR will change to an MBBR followed by AS system, which combines one Roughing Filter stage and one conventional activated sludge stage, while using the same tank volume. For solids removal an additional DAF was installed after the biological treatment. The wastewater temperature is adjusted to 35⁰C, an optimal temperature for the biological process.

Design

Present Situation



Future Situation



The existing primary treatment retained and DAF effluent as well as the additional wastewater flow of 4,500 m³/d are directed to the AGAR reactor for BOD removal. The present filling ration for the MBBR is 17%. In the future, the existing tank will be divided into 2 stages and the system will change to an MBBR followed by AS. Filling ratio of the Roughing Filter stage will be 65%. The effluent of the biological reactor will be directed to a tertiary treatment (DAF) for solids removal.

Results

The plant operates efficiently since the start up. Due to the high water temperature of 35⁰C, an almost full development of the biofilm was noticed in less than a week.

References

Location	Application	Capacity	Process Configuration
Europaper, Italy	Plant Upgrade	2,000 m ³ /d	MBBR (RF)
Torre Mondovi, Italy	New Plant	480 m ³ /d	MBBR+AS (RF+AS)
Valdivia, Chile	Plant Upgrade	8,500 m ³ /d	MBBR (RF) / MBBR+AS (RF+AS)