



Case Study

Biological wastewater treatment FBR in the dairy industry

Year 2009

Project location facilities of HELADOS ESTIU S.A. in Ribarroja, Valencia.

Objetivos • Removal of organic load from the pre-treated wastewater for the subsequent discharge of the effluent to the water collector. · Adaptation to future needs and expansion of the facility.

Installed technologies aeration tank for biological treatment; aeration system AQUAJET; coagulation-flocculation in-line system SIGMA PFL; flotation system SIGMA DAF FPAC-PWL; sludge thickening tank and sludge dewatering with centrifugal decanter; nutrients and chemicals dosing equipment; control and automation systems.

Capacity 1000 m³/day

Average organic load of the pre-treated wastewater	
DQO	DBO5
4500 mg/L	2500 mg/L

Efficiency of the full treatment	
COD removal	Dry matter content of the treated sludge
> 90%	>50%

Background

Helados ESTIU S.A. is a leader in the sector for the production of different types of ice cream. Its wastewater at the Ribarroja facilities contains a VERY HIGH MASS LOAD. The facilities already have a pre-treatment but the client also wants to install a biological treatment to eliminate the organic load required for discharge to the general collector.

SIGMA designs and installs a FBR process ('flotation bio-reactor') consisting of an aeration reactor where aerobic biological treatment is carried out (this biological process consists of the transformation of the organic matter contained in the wastewater into microbial flocs by adsorption and agglomeration) and a separation of the biomass by flocculation and secondary clarification by DAF flotation (in this process biomass flocs are formed and will be separated by flotation with air micro-bubbles in a DAF FPAC-PWL equipment. These special equipments obtain sludge with a dry solids content 3 or 4 times higher than any conventional system)

In the SIGMA DAF FPAC-PWL flotation equipment, perfectly clarified water is obtained that can be discharged meeting the discharge requirements and a sludge that will be partly recirculated to the biological reactor to maintain a stable biomass concentration and partly extracted as a purge. The addition of polyelectrolyte to the clarification system allows the generation of easily separable biomass flocs in addition to providing a high concentration of biomass inside the reactor and therefore a higher performance than in other biological systems of suspended biomass.

The SIGMA DAF FPAC-PWL flotation system is a modular system that is easy to expand and has a high capacity to adapt to different biomass concentrations. SIGMA also installs a complete sludge treatment process: thickening and dewatering in a centrifugal decanter.

Process diagram

