SIGMA DAF Clarifiers

Case Study

Full wastewater treatment RANC + FBR in the food processing industry

Year 2016

Project location Facilities of de Congelados de Navarra in Fustiñana, Navarra.

Objectives • Installation of a complete treatment of wastewater from the vegetable processing units that allows compliance with the discharge requirements. ·Flexible and adaptable treatment to the high variability and temporality both in flow and organic load of wastewater.

Installed technologies pump systems, screening and sand separation; homogenization tank; anaerobic reactor SIGMA RANC; gas filter; clarifier SIGMA BIODAF-FPBC-PWF; aerobic reactor and aeration system; final clarifier SIGMA BIODAF 200-TWIN; in-line flocculation system SIGMA PFL; full sludge treatment via dewatering with centrifugal decanter. Control and automation systems.

Average capacity 1300 m^3/day

Wastewater characteristics for process design			
COD	BOD5	TSS	TKN-K
15000 mg/L	8000 mg/L	2000 mg/L	175 mg/L

Treatment efficiency		
COD removal	TSS removal	TKN-N removal
> 96%	> 97%	> 91%

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Background

Congelados de Navarra S.A. is a leading company in its sector. Its activity is focused on the processing of vegetables for later freezing. The wastewater from the Fustiñana factory has a high load of biodegradable organic compounds, this is why a complete biological treatment plant is designed and installed to reach the discharge limits. Two biological processes are installed in series: an anaerobic digestion with a SIGMA RANC reactor and an aerobic SIGMA FBR treatment. The plant also includes a gas filtering line and a complete sludge treatment. Given the seasonality of vegetable production, the plant is robust but flexible and can adapt to changes in production both in flow and in the nature of the water (from the processing of very different vegetables: cauliflower, broccoli, rice, potatoes, peas, etc. carrots, etc).

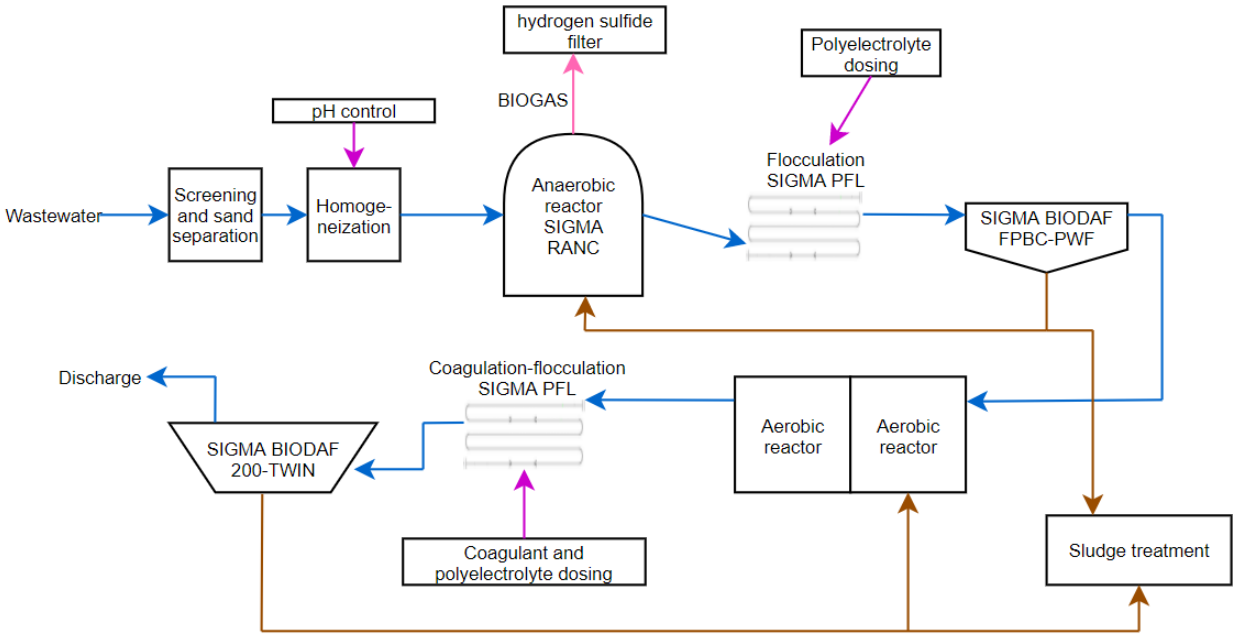
The **SIGMA RANC anaerobic** digestion process consists of a contact up flow reactor, where the removal of organic compounds is carried out under anaerobic conditions, transforming COD and BOD5 mainly into biogas and very little sludge generation. The anaerobic sludge is separated by flotation clarification in a SIGMA BIODAF-FPBC-PWF system. The biogas generated is treated in a filter to remove hydrogen sulphide.

The **FBR process ('flotation bio-reactor')** consists of an aeration reactor where biological treatment is carried out in the presence of oxygen. This biological process consists of the transformation of the organic matter that was not eliminated in the anaerobic reactor, in it microbial flocs are generated by adsorption and agglomeration. These biomass flocs are separated by coagulation, flocculation and secondary clarification by DAF flotation: in this process biomass flocs are formed that will be separated by flotation with air micro-bubbles in a SIGMA BIODAF 200-TWIN equipment.

The flotation clarification equipments SIGMA BIODAF are special equipments that present greater reliability against spongy sludge with low sedimentation rate, such as those typically generated in the treatment of industrial wastewater.

The sludge generated in both clarifications is treated jointly by dewatering with a centrifugal decanter equipment.

Process diagram



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