



Case Study

Reuse of wastewater from the cosmetic industry: full treatment process applying CAF, DAF and MBR

Year 2011

Project location Beiersdorf Manufacturing Tres Cantos S.L. - Madrid.

Objectives Design and installation of a wastewater treatment plant to obtain very high quality water for **reuse** in the process. Treatment of the sludge generated in the plant.

Installed equipment

- Oils and fats separator SIGMACELL ACAF
- Equalization tank with aeration by diffusers AQUA-JET
- Coagulation, flocculation and pH adjustment system (includes reagent preparation tanks and reaction tanks)
- Flotation system SIGMA DAF FPBC-PWF
- Biological reactor MBR with external module of Ultrafiltration membranes
- Aerobic sludge digestion reactor
- Sludge dewatering with centrifuge

Capacity 600 m³/day, with capacity for 900 m³/day in future manufacturing plant extension.

Wastewater characterization			
COD (mg/L)	BOD5 (mg/L)	TSS (mg/L)	Oils and fats (mg/L)
11600	3700	1060	2000

Removal performance of the physical-chemical treatment (CAF + DAF)			
COD (%)	BOD5 (%)	TSS (%)	Oils and fats (%)
44	19	81	95

Removal performance of the biological MBR treatment			
COD (%)	BOD5 (%)	TSS (%)	Oils and fats (%)
96	95	95	95

Global plant removal performance			
COD (%)	BOD5 (%)	TSS (%)	Oils and fats (%)
98	96	99	95

Reuse of wastewater from the cosmetic industry: full treatment process applying CAF, DAF and MBR

Wastewater from the cosmetic industry is characterized by a high content in suspended solids, COD, oils and fats. Given the tightening of discharge limits and the increasing need for water reuse, more and more intensive and efficient treatment processes are being applied that include advanced technologies to meet the quality requirements of reuse. In the case of Beiersdorf Manufacturing Tres Cantos S.L. SIGMA designs and builds a complete **wastewater reuse plant**, based on a physical-chemical process (CAF, coagulation - flocculation, DAF) followed by a biological MBR process.

Fats and oils are removed in the SIGMACELL ACAF equipment. The water is then homogenized and subjected to a carefully studied coagulation-flocculation process, for this, Jar-Test tests were carried out to determine the type and optimal dosage of coagulant (PAC with polyamine) and flocculant (cationic polyelectrolyte). The flocculated solids are separated in a SIGMADAF FPBC-PWF equipment that allows obtaining a very high quality clarification. For the elimination of biodegradable organic matter, an MBR 'Membrane Bio-Reactor' biological treatment system is installed with advanced Ultrafiltration membrane technology. This allows to obtain a very high quality of water that is recirculated and reused in the production process of the cosmetic plant.

Oils and fats removal in equipment SIGMA ACAF

- Simple operation - does not contain complex mechanical equipment and does not require manual intervention.

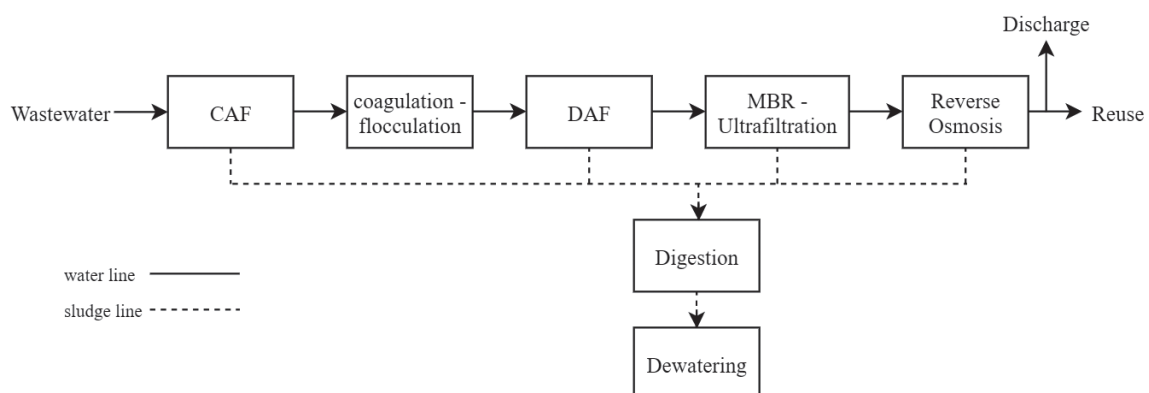
- Wide range of treatment capacity: there are SIGMA ACAF equipment that allows treating up to 500 m³/h, and can even be adapted to the treatment of higher flowrates using special systems.
- Excellent results: oil and grease removal in a SIGMA ACAF system can reach up to 99%.
- In addition to the elimination of oils and fats, these equipments support the rest of the treatment since they allow the separation of a high percentage of suspended solids.

Total suspended solids removal in equipment SIGMADAF

- High and constant quality of the clarified water.
- Quick start-up.
- Minimal sludge production (sludge concentrations of up to 5%, much higher than the achieved by conventional settlers).
- Easy to operate with simple, adaptable and efficient control systems.
- Known technology, flexible to each case and robust.

Aerobic biological process MBR with Ultrafiltration membranes

- Very high organic load reduction performance (>90% COD and BOD₅ removal).
- Very high concentration of BIOMASS inside the reactor: between 6,000 and 12,000 mg/L MLSS.
- COMPACT and MODULAR plant, simple to operate.
- High resistance to oxidizing agents.
- Very high and CONSTANT quality of the water discharged with the possibility of REUSE.
- Minimum generation of sludge.



Sigmadaf Clarifiers, S.L.
 Polígon Industrial Pont Xetmar
 Carrer C, nº 19
 17844 Cornellà de Terri (Girona)
 +34 972 223 481
 info@sigmadafclarifiers.com
 sigmadafclarifiers.com

Member of:

