

Maceió Alagoas, Brazil adopts CFIC® biofilm technology (Continuous Flow Intermittent Cleaning)

“CFIC® technology offers 50% reduction in energy consumption compared with conventional MBBR, which, together with the reduction in carbon footprint, means cost savings throughout the plant’s lifetime.”



Maceió is the capital and largest city of the coastal state of Alagoas in Brazil. Known locally as “The Paradise of Waters” the name “Maceió” is an indigenous term for a spring. In the city itself most “maceiós” flow to the sea, but also from lakes or “lagoas”.

The city of Maceió as well as having a rich cultural heritage is home to postcard perfect beaches of emerald green sea, white sand, natural pools and reefs. The local Mundau lagoon in Maceió with its transparent waters is also popular for bathing.

This Paradise of Waters provides the backdrop for the new Benedito Bentes Wastewater Treatment Plant. The core of the treatment plant is a CFIC® (*Continuous Flow Intermittent Cleaning*) biofilm solution by Norwegian company **Biowater Technology AS**, a turn-key project supplied by **Memphis Empreendimentos Ltda**, Biowater Technology AS partner and agent in Brazil.

Benedito Bentes WWTP

The Benedito Bentes plant is the principal venture under implementation for wastewater treatment solutions in the area. Most residents of Maceió city live by sea, however the new plant will treat the wastewater from the elevated area of the city known as Alto Maceio which has in recent times experienced high population growth.

The new plant will offer treatment and benefits to the 160,000 residents, with first phase coming on line in May 2019, and second phase due in 2020 with flows up to 360 l/s. As well as the new treatment plant, the city is investing in new infrastructure including over 160 km of new sewage collection network.

The investments are being made by SANAMA – Sanemento Alta Maceió, through a contract of Private Public Partnership with the state company Casal – Companhia de Saneamento de Alagoas. The contract between SANAMA and CASAL will last for 30 years.



In 2017 Biowater Technology AS through local partner Memphis Empreendimento proposed CFIC® as the solution for the wastewater treatment. This technology was chosen over other technologies as UASB, Activated Sludge, MBBR and IFAS due to its advantages including compactness, low TSS in the effluent (no need for a separate separation stage), ease of operation, and low operational cost.

The CFIC® technology offers 50% reduction in the energy consumption compared with conventional MBBR which, together with the reduction in the carbon footprint, provides cost reductions to the whole life of the plant.

Expectations for the new WWTP with the CFIC® technology

The expectations for the new wastewater treatment plant are high for the CFIC® technology. The treated effluent, due to the technology efficiency, is considered for use in washing sidewalks and irrigation.

We are very satisfied with the quick plant start-up and excellent effluent quality, already fulfilling the requirements set by the environmental regulations rapidly after the start of the treatment process. The plant optimised layout will allow us to increase the treatment capacity, following the growth in the project cover area, without large investments in civil works and using the existing area. With this technology we can treat all the wastewater from the covered project area in just one place optimizing investment and operational

cost”, declares Eng. Helio Moellman Ferreira de Barros Junior, Technical Director of SANAMA.

One of the most striking features of the CFIC® plant at Maceió is that the effluent flows directly to disinfection without an intermediate sludge removal step. This is achieved through intermittent running of the CFIC® reactors in washmode where sludge is removed to a separate treatment stream, without any suspension of the wastewater flow through the plant.

CFIC® technology saves energy and space

As well as offering savings in energy and space, the CFIC® technology also allows the operators to have full control over the frequency of washing and sludge handling. This extra level of control over traditional treatment technologies offers considerable savings as sludge removal can be simply adjusted to seasonal flow variations often experienced in areas of high tourism.

Since the plant operation has commenced the CFIC® plant in Maceió is only run in wash mode 12 hours per week. The **removal efficiency of the organic loading** since start up has been equally promising. Incoming COD (chemical oxygen demand) is 600 mg/l and effluent presents less than 120 mg/l, a removal of more than 80 % and well within the discharge limits for the project. The TSS (Total suspended solids) from the plant is less than 25 mg/l. The BOD (biological oxygen demand) in the effluent is also well under the maximum regulatory level (< 30 mg/L), with an average of 23 mg/L.

The Maceió plant is set to be the largest CFIC® installation in the world based on flow capacity when the second stream comes on line in 2020/2021. It will join the expanding global reference list of the plants with CFIC® technology, together with other projects as NSO Norway for industrial treatment (2014) and Jinbai China (2017) for municipal treating flows up to 30,000 m³/day for both organics and total nitrogen removal as CFIC® becomes the new standard for biofilm technology.

“The CFIC® plant in Maceió is a global milestone in the use of emerging biofilm technology over traditional solutions. The positive environmental impact will last for the life of the plant, and due to the innovative technology adoption, also for generations to come.”, says Ilya Mario Savva, CEO of Biowater Technology AS.