

Retrofitting of a wastewater treatment plant from the food industry in northern Italy using MBBR technology



A complete retrofitting of a wastewater treatment plant (WWTP) in the North of Italy was conducted in the years 2020 / 2021. The design was developed in close cooperation with the client and a British consultant specialized in wastewater treatment plants.

NUMBERS & FACTS:

- Country: Italy
- Hydraulic plant capacity: 1000 m³/d
- Organic Load: 1900 kg/d (COD)
- Year(s) of construction: 2020/2021

CONCEPTUAL FORMULATION.

The main task was to extend the existing WWTP so it can cope with future increase of production capacity of the factory on a 10-year horizon. The existing equalization basin was completely restored, and the process furthermore increased with pretreatment facilities and a biological treatment step to decrease the organic load before the wastewater enters the public sewer system. CUSS was in full

charge of all required civil works and mechanical + electrical installation while the production was kept at full operation.

One core challenge was the lack of space. Yet to guarantee the required effluent parameters it was decided to implement the MBBR (**M**oving **B**ed **B**iofilm **R**ector) technology. This biological treatment concept consists of aerated bioreactors which are filled with special biocarriers present in form of plastic chips. The high density of active biomass which is growing on the surface of the chips allows a much smaller tank footprint compared to other active biomass systems.

Another advantage of the robust technology is the easy expansion of treatment capacity by simply adding more biochips into the bioreactor.

The main treatment equipment was installed in 20' (side door) shipping containers to allow an easy and fast installation on site. A small expense regarding civil works and a high degree of pre-assembly in the CUSS workshop were additional advantages of this decision.

The containers were after their arrival in Italy simply lifted with a crane from a truck to their end positions on site.

The mechanical and electrical installation, commissioning, and operation of the plant from our well-skilled personnel until the point of acceptance by the client was also in the full package of this turn-key project.

WASTEWATER CONSTITUENTS:

- High organic load from product residues of the production site
- Small nutrient concentration
- Surfactants and disinfection agents from cleaning processes

PROCESS STEPS:

- Pump Station
- Mechanical Pre-treatment (liquid-solid-separation)
- Equalisation and Neutralisation
- Biological Treatment
- Nutrient and Anti-Foam Dosing
- Secondary Clarification using a dissolved air flotation
- Aerobic Sludge Conditioning