

## Environmental technology

### AQUAFIN - Aalst

## Aeration system upgrade of the water treatment

**Aquafin** is responsible for the pre-financing, expansion and management of water treatment infrastructure in the Flemish region. This water treatment infrastructure includes sewage treatment plants, pumping stations, collectors and sewers. Many adjustments to existing outdated WWTPs are necessary, such as the replacement of surface aerators by more efficient fine bubble aeration. In Aalst's sewage treatment plant (WWTP), 2 outdated point aerators were replaced by an energy-efficient fine-bubble aeration system using aeration panels. Trevi was responsible for the coordination and execution of this project.

The WWTP of Aalst consists of 2 plug flow reactors with a total volume of 27.560 m<sup>3</sup>. The public tender included a replacement of 2 of the 6 point aerators with a fine bubble aeration system, requiring a guaranteed oxygen input of more than 377 kg O<sub>2</sub>/h for the 2 basins.

The contract was awarded to Trevi based on the lowest Total Cost of Ownership, which consists of the total investment, energy and maintenance costs.

The required oxygen input was achieved by an air flow of 3.340 Nm<sup>3</sup>/h per surpressor and an energy performance of 3,15 kg O<sub>2</sub>/kWh in waste water conditions. The high energy efficiency is the result of a high oxygen transfer of the aeration panels (manufactured by Trevi using Messner membrane foil), as well as the high energy efficiency of the selected direct drive screw compressors (Gardner Denver).

The fine bubble aeration panels were distributed in each basin over 5 fields of 18 panels. Each aeration panel is connected to the corresponding air collector with an individual HDPE pipe and ball valve.

To ensure easy accessibility, platforms were placed on top of the partition walls. In this way the collectors of each aeration field are accessible from the concrete walkway on top of the aeration basin.



*Construction of a segmented stainless steel wall*

In each basin an additional guide wall had to be built. For this purpose, a segmented stainless steel wall was installed which needs to withstand a water pressure of 4,15 m on both sides of the wall.

Aalst's WWTP is located next to a nature reserve, therefore strict requirements apply with regard to noise standards. All suppressors were placed in a stainless steel housing with sound insulation to comply with the legislation, resulting in a noise level at 1 m distance of less than 70dBa. In addition, all air lines were insulated between the suppressors and the individual ball valves. The insulation jacket consists of a combination of 10 cm rock wool cover and anti noise plates.

The replacement of the point aerators was carried out in multiple phases so that the waste water treatment process could continue at all times and the effluent standards were guaranteed. In just 2 weeks, the air lines, the platforms, the aeration panels and the guide wall were placed in each basin. In June 2018, full aeration was re-commissioned without any problems.

The replacement of the aeration system at the WWTP in Aalst was a successful collaboration between Trevi and Aquafin, resulting in an energetically efficient aeration and a very satisfied customer!



*Insulated air line and insulated collectors on platforms*



*Screw compressors in soundproof cabinet*



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