

Sulzer's aeration system improves wastewater treatment in a frozen vegetables plant

Ardo Group is a large European frozen food company with 21 production, packing and distribution sites in nine countries. The Ardo factory in Koolskamp, Belgium, produces more than 200'000 tons of fresh-frozen vegetables per year – mainly peas, beans, root vegetables, spinach, Brussel sprouts, cauliflower and celeriac. The factory has its own wastewater treatment plant with an anaerobic digester, aerated biological basins and a tertiary filtration stage with UF and RO membranes. Most of the treated water can be reused on site, in line with Ardo's sustainability practices. To further improve the efficiency of the WWTP, Ardo recently decided to progressively replace the old surface aerators in the biological basins by optimally-adapted equipment.



We discovered the winning combination for our aeration process: OKI aerator mixers and HST turbocompressors.

Dirk Dewulf, Technical Service Ardo Group

The Sulzer difference

- In partnership with end users and contractors, Sulzer provides customized aeration and mixing solutions and strong service for wastewater treatment.
- Hundreds of OKIs are used in the WWTPs of food plants. They are quick and easy to install, which makes them ideal for upgrading existing aeration systems.
- HST turbocompressors are known for their top efficiency, low life cycle cost, and minimal environmental impact.

The challenge

Processing of vegetables requires large quantities of water, mostly for washing and blanching. The highly-polluted (COD values up to 10'000 mg/l) effluents are discharged to the wastewater treatment plant. This WWTP has an average flow of 4'000 m³/day, but the flow and the load can vary greatly depending on the season and the type of vegetables processed. Consequently, it is important to have versatile equipment, which can adapt quickly to changing conditions.

For the aerobic activated sludge process, the three biological basins (4-6 meters water height each) were initially equipped with high-speed surface aerators that did not perform in a satisfactory way. Below a depth of three meters, the oxygen transfer in the mixed liquor became insufficient. Furthermore, some sediments were accumulating at the bottom of the basins. Other problems occurred above the surface, such as splashing noises and aerosols polluting the walls of nearby buildings. Therefore, Ardo started to look for an alternative aeration system in 2016.

The solution

Sulzer, together with local contractor Vewaco, delivered four OKI aerator mixers fed by one HST turbocompressor for basin 1. Ardo also received offers from other suppliers, but finally chose Sulzer's equipment – not only based on technical considerations, but also relying on the strong trust in our products and people. Prior to the order, Sulzer organized a visit with Ardo to a French municipal wastewater treatment plant using OKI and HST. This was a good opportunity for the client to see the equipment in operation, and to hear the very positive feedback from the French operators.



Biological basins where OKIs replace surface aerators.

After the order, the collaboration with the client remained strong, including product training and advice given on how to optimize the biological process by using OKI alone (mixing mode) or with HST (mixing and aeration mode). As soon as the first four OKI 2000 aerator mixers had been installed at the bottom of the main biological basin, the improvement was remarkable. Total power consumption was reduced by 35% and all previous problems (uneven oxygenation, sedimentation, bad odors, aerosols) were eliminated.

After one year of smooth operation for basin 1, a second set of four OKIs + one HST replaced the surface aerators in basin 2. A third replacement set for basin 3 is planned during 2019.

Customer benefit

The OKI aerator mixers are liftable and self-standing. They were installed easily and quickly at the bottom of the tanks without emptying them. The OKIs have an adjustable standard oxygen transfer rate (SOTR) with remarkable maximum values, which makes them ideal for aeration and mixing of wastewater with high and changing organic loads. Their performance remains constant with time. Ever since the first four machines were started in the main aeration basin, they have been running smoothly with low maintenance needs thanks to their robust design and reliability.

The HST high-speed turbocompressors offer an outstanding wire-to-air efficiency. They use digitally controlled magnetic bearings, which cause no mechanical friction or wear. This means that regular maintenance is reduced to changing the air filters only. In the compressor room the working environment is optimal as the HSTs are extremely silent (61 dB).



OKI aerator mixers are fast and easy to install.

Product data

Three rectangular aeration basins with 4-6 meters water height each:

Basin 1: 4 OKI 2000 C-15AM fed by 1 HST 20-4500-1-125 (installed in 2017)

Basin 2: 4 OKI 2000 C-15AM fed by 1 HST 20-4500-1-125 (installed in 2018)

Basin 3: 4 OKI 2000 C-15AM fed by 1 HST 20-4500-1-125 (planned end of 2019)

OKI 2000 C-15AM

Power	15 kW
Protection type	IP68
Voltage	400 V / 50 Hz
Temperature control	Thermal switch 130°C
Dimensions (D x H)	2'045 x 2'075 mm
Unit weight	1'930 kg
SOTR	0 to 120 kg O ₂ /h

HST 20-4500-1-125

Airflow	2'500 to 5'200 Nm ³ /h
Pressure rise	40 to 60 kPa
Input power	114 kW max.
Current (400 V)	198 A max.
Power supply	400 V
Input frequency	50 Hz
Thermal protection	2 x PT100



HST turbocompressors are compact and silent.

Applicable markets

Industrial and municipal wastewater

Applicable products

OKI aerator mixer, HST turbocompressor

Contact

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