KAESER COMPRESSORS®

KAESER report

A magazine for the production industry

Portugal: Wastewater treatment with KAESER

Compressed air for a cleaner future

For almost 200 years, the wastewater management sector in Portugal has had to face ever increasing challenges, brought about in large part by the rapid population growth since the beginning of the industrialization process of the mid-19th century. This growth was compounded by rapid development of the textile industry in the north of the country, where many of the manufacturers are located in the region around the Ave River.

Home to approximately 700,000 people, the heavily industrialized Vale do Ave region (Valley of the Ave River) covers an area of some 15,000 square miles and includes 14 municipalities in the districts of Braga and Porto. During the 20th century, the textile industry saw strong growth in the region around the Ave River and its tributaries, due to the fact that water was required not only as a resource, but also as a means for discharging industrial wastewater. As the industry grew, so did the demand for labor, which in turn led to corresponding population growth and increased pressure on the local environment. Deterioration of the water quality in the rivers of the catchment area was therefore inevitable – in fact it became so bad the water was deemed “not suitable for consumption” and, in some parts of Vale do Ave, even “harmful to aquatic organisms”. It was clear that urgent improvement measures were needed, the implementation of which began to take shape in 1998 with the establishment of SIDVA (the Portuguese acronym for Vale do Ave Integrated Rehabilitation Project).

Extensive rehabilitation

TRATAVE is the name of the institution established that same year exclusively to manage and operate the SIDVA project,

The project team at TRATAVE is extremely satisfied with the environmental friendliness and energy efficiency of the KAESER system.

making it responsible for the drainage, purification and end use of both industrial and domestic wastewater in the municipalities of Guimarães, Vizela, Vila Nova de Famalicão, Santo Tirso and Trofa. Its most important objectives include protecting the local ecology and improving the quality of the environment, in collaboration with local residents and businesses. The sustainable activities undertaken and encouraged by TRATAVE are credited with a significant increase in water quality and a corresponding improvement in the quality of life for the inhabitants, helping to mitigate the effects of the human population and industrial activity on the region’s ecosystem, which remains one of the most heavily affected in the country.

Around the middle of 2020, TRATAVE made the decision to invest in modernizing the aeration system for the biological reactors at the Serzedelo II wastewater treatment plant – a system which uses ambient air to ensure healthy growth of the microorganisms active in the clarification tanks. Seeking a low-pressure compressed air supply that would not only be completely dependable, but would provide the performance, energy efficiency and environmental friendliness which only the very latest technology can offer, TRATAVE turned to KAESER Portugal to implement the project – one tailor-made for turbo blowers. PillAerator turbo blowers from KAESER were

The PillAerator LP 14000 turbo blower from KAESER achieves the project's needs in full, with 25% less power consumption than the previous system.

developed specifically with aeration applications in mind; equipped with an innovative magnetic bearings system, the drive system on these machines operates completely wear-free. Moreover, the combination of a directly driven, magnetic bearing rotor and an intelligent controller means that PillAerator turbo blowers are exceptionally efficient, saving up to 25% of the energy consumed by machines using conventional technologies.

Turbo control

PillAerator blowers make a significant difference when it comes to saving energy. They not only enable optimized application-specific operation, but are also able to react quickly to changing conditions. Use of the very latest measurement technology and perfect interplay between all components allow motor power to be modulated anywhere between 15 and 100% capacity. Integrated, continuous measurement of the process air mass flow allows the delivered flow rate to be adjusted in accordance with the changing needs of the application. This makes the process simple to control and also prevents energy losses due to over-aeration.

Energy efficiency par excellence

Prior to the modernization project, the TRATAVE air system consisted of a rotary lobe blower supplied by another manufacturer. Owing to its frequent faults and a relatively high power consumption of 400 kW, this machine was no longer fit for purpose, hence, following an intensive analysis and the decision to go with KAESER technology, a superior system design was proposed for the rejuvenated facility, delivering an air volume of 2400 scfm and pressure of 11 psig. As a result, the air supply for one of the plant's aeration tanks is now provided by a PillAerator LP 14000 turbo blower from KAESER (flow rate 2650-9430 scfm, gauge working pressure 4-13 psig), which delivers the exact amount of air required for the process. Operating in the low-pressure range of 11 psig with a power consumption of 300 kW, this system achieves a saving of 25% compared to its predecessor. The actual consumption figures confirm the energy savings calculated in advance by the KAESER experts, yet the system still provides the performance necessary for the treatment process.

KAESER turbo blowers support sewage plants in achieving their environmental goals.

The new PillAerator LP 14000 turbo blower supplies the aeration tanks with ambient air to promote healthy microorganism growth.