



Energy-Efficient Blowers Are Helping Clean The Riachuelo River



Leathermaking is a major part of Argentina's economy, in particular in the Lanús district of Buenos Aires, Argentina. But while tanneries thrive, those who live near the Matanzas Riachuelo Basin have struggled for decades. The Riachuelo River is one of the most polluted in the world, and a major part of the pollution comes from tannery effluent.

Thankfully, a long-awaited project, the Curtidor Industrial Park (PIC), aims to change that. The industrial center is being built around 30 tanneries and will provide accommodations for other tanneries upon completion. The main benefit of the PIC will be a large industrial wastewater treatment plant (WWTP) designed specifically to process tannery effluent. It uses state-of-the-art technology to treat the particularly toxic waste, including energy-efficient turbo blowers that will both keep costs down and further reduce the region's environmental impact.

A Need For Change

Matanzas Riachuelo Basin is home to more than 4.5 million people. It is also home to numerous industrial activities, including more than 60 tanneries. Many of these tanneries are small or midsize businesses operating on tight margins. This means most cannot afford to invest in any sort of effluent treatment. As a result, for decades these and other businesses have been pouring millions of gallons of untreated wastewater directly into the river.

The tanning process transforms animal skin into leather. The skins, after being cleaned of their fats, meats, and hair or wool, are subjected to different chemical agents that interact with the collagen fibers to create a stable and durable leather. Tannery effluent is known for its high levels of dangerous contaminants. This includes heavy metals, such as lead, nickel, zinc, copper, and chromium, as well as a variety of salts, sulfides, and sulfuric

acids. It also contains large amounts of organic solids.

As a result, the river is one of the most polluted in the world. The water is plagued with unhealthy levels of heavy metals, toxins, bacteria, cysts, and more. The people who live closest to the river suffer from high rates of cancer, lung disease, and gastrointestinal illnesses.

An initiative promoted by Matanzas Riachuelo Basin Authority (ACUMAR) and financed by the World Bank seeks to end the pollution in the river by providing a dedicated 27,000 m² industrial park for these businesses to relocate to, which would be centered around a specialized treatment plant (Figure 1). The project began in 2009 but political and logistic challenges caused numerous delays. Construction is currently underway, and the plant is expected to be completed by mid-2023.



Photo courtesy of Curtidor Industrial Park (PIC). Used with permission.

Figure 1. The long-awaited Curtidor Industrial Park (PIC) is slated to be completed in 2023 and will process effluent from all 62 tanneries that operate near the Matanzas Riachuelo Basin in Buenos Aires. The project is a critical first step to cleaning up the Riachuelo River and improving life for those in the area.

The core technology of the PIC WWTP is the moving bed biofilm reactor (MBBR). This technology has a much smaller footprint than traditional activated sludge systems. The plant will also use sodium hydroxide to precipitate and remove chromium and catalytic oxidation to reduce sulfides.

[Ecopreneur](#), an Argentinian wastewater treatment company, designed and engineered PIC's treatment process and selected Aerzen technology as a cornerstone to the MBBRs.

Cutting Energy Costs

Wastewater treatment is an energy-intensive process. About 60% to 70% of energy consumption is associated with blowers — a key component of MBBRs. The PIC WWTP requires five 400-hp blowers for various processes. In order to keep costs down and ensure the lowest possible carbon footprint, the plant installed [Aerzen AT400 turbo blowers](#).

These high-speed blowers operate at up to 25,000 rpm. The technology is 20% to 25% more efficient, as well as about one-third the size and weight of lobe blowers. Compared to lobe blowers, the PIC will save 3,398 megawatt-hours per year, equivalent to approximately 1,250 homes. In total, it will reduce possible CO₂ emissions by about 950,000 kg per year.

In addition, the blowers cut labor costs by performing their own preventive and predictive maintenance. By measuring parameters such as inlet pressure, discharge pressure, temperature, RPMs, and flow, the internal computer is able to notice deviations in performance that may indicate the need for maintenance. This allows operators to get ahead of any potential problems before the blower goes down.

The blowers also take measurements of [conditions inside the MBBR](#). That information is then relayed to the SCADA system, which adjusts the speed of the

blowers to ensure they are operating at the best efficiency points (BEP) and that the chemical oxygen demand (COD) for digestion is being met.

Next Steps

Once the PIC WWTP is up and running, the remaining 32 tanneries in the region will be required to relocate to the industrial center. The businesses, which were unlikely to be able to afford their own in-house treatment systems, will then have access to cutting-edge treatment technology, for which they will pay a nominal fee per cubic meter of effluent.

But this isn't the end of the journey. There are already thoughts on how to expand the WWTP so it can process additional industrial effluent from other businesses, further helping to reduce pollution and, ultimately, restore the Riachuelo River. It is hoped that one day the river basin region will thrive with both industry and a clean environment. ■