

Blowers clean biologically at the Elmo Leather wastewater treatment plant

A case study from Emotron





Emotron FDU variable speed drives control blowers and pumps at Elmo Leather's new wastewater treatment plant. "This is the first time a fully biological purification method has been used in the tanning industry," explains works engineer Jan-Allan Hasselqvist (on the right).

Elmo Leather's new wastewater treatment plant is the first of its kind. The fully biological process has never been tested before in an operation that uses such large quantities of chemicals. Good results mean that the company will lead the way for other tanneries in Europe. Emotron's variable speed drives control, amongst other things, the blowers that oxygenate the waste water.

Leather tannery built its own wastewater plant

Elmo Leather AB was founded in 1931 and is one of the world's largest manufacturers of exclusive leather for the furniture and automotive industries. The parent company is in Svenljunga and there are two subsidiaries, one in the USA and one in Germany. The manufacturing side of the business is concentrated in Svenljunga, and this is where most of the 370 employees are based. The majority of the products are exported and sold all over the world.

A huge amount of chemicals are used in the tanning industry, which means there are strict requirements for the purification of the waste water. In the summer of 2005, when the municipal sewage treatment plant in Svenljunga was due to be renovated, the tannery's

expansion meant that the local plant would have struggled to cope with the extra load it faced. So Elmo Leather built its own treatment plant next to the local authority's.

Biological process tested for first time

The new treatment plant uses a biological process called nitrification/denitrification which means that the pollutants are broken down using micro organisms. The waste water is oxygenated to enable the micro organisms to grow and multiply. When the supply of oxygen is then stopped, the organisms are forced to feed on the nitrogen pollutants in order to survive. This biological technique is used in municipal sewage treatment plants, but has never been tried before in the tanning industry. It was not thought possible due to the vast amount of chemicals.

Nitrogen emissions reduced by 80 percent

The treatment plant was formally opened in June 2005. The EU's environmental fund contributed almost SEK 9 million of the some SEK 50 million required to build it. During the running-in period, the municipal plant was ready to take over if anything should go wrong, but everything went like clockwork. Tests show that the goal has been achieved – the nitrogen emissions are being reduced by 80%, compared to 30% in the old plant. "The authorities have very strict requirements for

purification and we are meeting them,” says service engineer Jan-Allan Hasselqvist. “It’s the first time I’ve worked with this biological method, and it’s also the first time it’s been used in the tanning industry. It’s been an interesting process.”

Local authority recommended Emotron

Three people now work in the treatment plant which is dimensioned for the equivalent of 74,000 pe¹. As a comparison, it’s worth noting that following its renovation, Svenljunga’s municipal treatment plant is dimensioned for 3,000 pe.

Svenljunga EI installed the control system. They chose Emotron as a supplier after the company was recommended by the local authority, which uses Emotron’s products in its plant. Now a total of eleven Emotron FDU variable speed drives control blowers and pumps. They are all installed in an electronics room, which facilitates control and monitoring.

Blowers oxygenate the waste water

The waste water is oxygenated during the cleaning process via air being blown in. Four blowers are used for this purpose and they are controlled by Emotron FDU variable speed drives. Sensors measure the oxygen levels and send signals to the variable speed drive that ensures oxygen is added at the right time and that the oxygenation lasts for the required length of time. The bacteria that are to clean the water need a certain amount of time to grow and multiply. Oxygenation takes about 120 seconds for 5,000 m³ water.

During the waste water’s journey from the factory to the treatment plant, it passes through a number of settling tanks. The sludge that gets absorbed is centrifuged and used for soil improvement or is combusted. The slag that contains heavy metals goes to landfill sites, but the possibility of recycling chrome is currently being investigated.



The plant’s eleven Emotron FDU variable speed drives are installed in an electronics room. Having them all in one place facilitates control and monitoring, according to operating technician Oskar Österling.

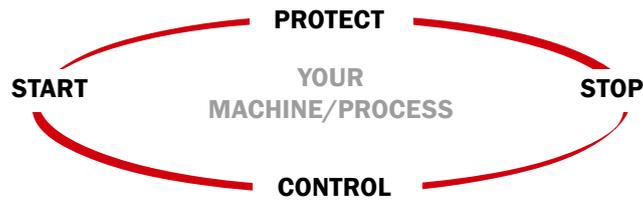
Emotron variable speed drives also control 12 pumps that are located 6-8 metres down in a tank which, in turn, is inside a larger tank. Oxygen is added in the outer tank. The entire process is controlled via the iFix operator system and communication takes place via Profibus.

1) Pe, population equivalent. The average emission of organic pollutants per person and day, i.e. how much oxygen is required to clean the water.



When Elmo Leather built its treatment plant, Emotron variable speed drives were chosen to control pumps and blowers. The recommendation came from Svenljunga local authority, which uses Emotron products in the municipal treatment plant.

A dedicated product portfolio



Emotron's product portfolio meets all levels of need for machines and processes driven by electrical motors. You will always find the optimum solution for your specific situation. When choosing Emotron, you will also benefit from cost-efficient installation and commissioning

through built-in functionality that is otherwise provided by additional equipment. You will also find intuitive user and process interfaces with the possibility of communicating critical parameters to other parts of your process, using analogue, digital, serial or fieldbus communication.

PROTECT



Emotron Shaft Power Monitors

when you wish to protect your application from over- and underload situations

START • PROTECT • CONTROL • STOP



Emotron Variable Speed Drives

Emotron Compact Drives

when you wish to protect your application from over- and underload situations, optimize the start and stop sequences of your application, as well as be in full control of your process values – flow, pressure, speed, torque, etc.

START • PROTECT • STOP



Emotron Softstarters

when you wish to protect your application from over- and underload situations, as well as to optimize the start and stop sequences of your application



Dedicated drive

Emotron focuses on solutions for starting, protecting, controlling and stopping machines and processes driven by electric motors.

Our drive is to create measurable benefits for our customers and their customers to achieve their and our business goals, thus creating a win-win relationship for all parties involved with Emotron.

We have been developing our product portfolio during over 30 years towards carefully selected applications.

As a result we have built up specialist competence and can therefore offer our customers the optimum solution for their specific application needs.

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