

Aquarden's Waterox system saves money for Alfa Laval Nakskov

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Alfa Laval Nakskov expects significant cost reductions by means of Aquarden's Waterox wastewater treatment system, and has plans to expand the system.

Aquarden Technologies in Skævinge, Denmark, has been treating Alfa Laval Nakskov's wastewater over a period of time at Aquarden's premises to develop an efficient and compact solution that will help Alfa Laval Nakskov treat a large proportion of its wastewater on the company's own premises in future. The system will reduce the need for transporting the wastewater to another location for treatment. Alfa Laval Nakskov will not actually purchase the system, but instead pay for the amount of wastewater that is treated. Later on, the plan is to expand the system.

Economic incentive is critical

Gitte Helm, production engineer and membrane specialist with Alfa Laval Nakskov, stresses that the economic incentive is, indeed, the decisive factor: "We must be completely certain that Waterox is an

economically attractive way of handling our wastewater. It has to be cheaper for us to clean our wastewater ourselves rather than having it transported to somewhere else and paying for external treatment; this is where we can save money."

She adds: "We need to be sure the system will be efficient. But we feel very confident about that because the test results have been very convincing. And the fact that we'll only pay for the amount of wastewater that's treated has made it easier for us to decide to use the Waterox technology."

Alfa Laval Nakskov

Alfa Laval's Business Centre Membranes in Nakskov develops and produces polymer membranes and advanced filtration systems for the biotechnological and pharmaceutical industry, the food industry, the process

industry, the wastewater industry plus other selected customers and applications. Gitte Helm explains: "Our production involves different types of solvents that end up in the wastewater. We send it away to have it treated or incinerated because we don't have the facilities to do this ourselves."

Expansion of system

The system on Alfa Laval Nakskov's premises will be able to handle at least 1,200 m³ of water a year. When it has proven its worth in Nakskov, the company will have a need for it to be expanded. "We'll need the system to be three to four times bigger than the one that we're going to use at first," says Gitte Helm.

Expanding the system will not be a problem, says Zhuoyan Cai, Aquarden's director: "We'll be ready and pleased to do that when the time comes. We'll deliver a very compact solution that's easy to install and also make sure the economy remains advantageous. There's no doubt that the solution must make very good economic sense to Alfa Laval Nakskov, and we're going to prepare some very reliable cost-benefit analyses to reassure them that'll be the case."

Trust is paramount

Great trust from customers is of critical importance if they are to become involved in a project such as this one, and Aquarden's customer-oriented approach is vital. Zhuoyan Cai explains: "We provide total solutions, including design and dimensioning of our systems, and every solution must fit the customer's needs perfectly; it must be tailor-made. It's essential to us also that our customers feel entirely confident that our solutions are long-lasting, and we have all the required competences in-house here in Skævinge."



The semi-permeable membrane is a core element in Alfa Laval Nakskov's membrane filtration systems. The membranes separate liquid into two distinct streams.



Alfa Laval Nakskov is a leading manufacturer and supplier of membrane filtration systems for use in a wide range of Industrial processes.

Wastewater treatment revolution

The Waterox system has great environmental benefits. It makes use of a technology called SuperCritical Water Oxidation, SCWO, which is a physical state that water reaches when it is heated up to min. 374 degrees Celsius and pressurized above 221 bars. Director Zhuoyan Cai explains: "All hardly-degradable organic

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*Ms. Gitte Helm
Production engineer and membrane specialist
Alfa Laval Nakskov*

pollutants are broken down completely in a few seconds, no chemicals are added, and there are no hazardous by-products whatsoever. The SCWO technology isn't new, but what we've done is to design a very compact system that can be placed right next to the source of wastewater, and I don't hesitate to call this a revolution. Other methods, such as incineration, require a lot more energy and are much more expensive. Other cheaper methods aren't nearly as efficient."

Waterox is designed to handle waste streams from, for instance, the pharmaceutical, chemical and biotech industries, hospitals, landfill, metal processing, etc. Waterox completely purifies the wastewater, which can then be led directly into the water environment without any extra charges being incurred.

The heat energy generated by the supercritical process is often so great that it is profitable to exploit it for some other purpose. And wastewater that has been treated in the Waterox system can also be used as process water. Gitte Helm hopes this will be an option for her company. Recycling of water in processes would entail significant savings in that water is costly. And after wastewater has been treated in the Waterox system, it does not have to be softened.

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Mr. Zhuoyan Cai
Founder and owner of Aquarden Technologies

Aquarden is currently engaged in dialogues with a series of Danish companies. Aquarden director Zhuoyan Cai says: "Our system is designed to handle the most problematic wastewater, and we're aiming for a market that includes pharmaceutical companies and other types of companies that work with solvents, oils and phenols or other problematic substances. Denmark is where we prove how profitable and advantageous Waterox is; then we'll launch the system into foreign markets."

About Aquarden – a total solution provider

Aquarden is an expert in sustainable treatment of problematic wastewater and offers total solutions for



Aquarden's Waterox system breaks down all hardly-degradable organic pollutants completely in a few seconds without adding any chemicals.

solving the toughest wastewater challenges. Aquarden delivers consultancy, turnkey systems, and services – all customized to meet customers' specific requirements. The mission is to help clients in meeting the highest environmental standards for wastewater treatment by providing green and effective solutions. The proprietary and prize-winning Waterox-system destroys all organic and toxic compounds in wastewater completely and efficiently, and reuses energy and water.

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