Chemicals producer reuses wastewater treated with MBR for domestic use

Galaxy Surfactants, India **Case story**

After side-by-side testing, speciality chemicals producer Galaxy Surfactants, India, chose Alfa Laval hollow sheet membrane bioreactors (MBRs) instead of flat sheet solutions for three industrial wastewater treatment plants. With MBR Galaxy will, after installation of reverse osmosis, be able to reuse the water for domestic purposes, successfully pursuing their zero liquid discharge (ZLD) strategy and saving fresh water resources.

Galaxy Surfactants is a leading manufacturer of speciality chemicals which are used as raw materials by leading home and personel care products manufacturers worldwide such as Unilever, Henkel and L'Oreal. Galaxy has 5 manufacturing facilities in India, one in the State of Gujarat and 4 in Maharashtra, plus a facility in Egypt, all adhering to the principles of good manufacturing practises (GMP).

Alfa Laval India has had a strong relationship with Galaxy for more than a decade and has supplied a wide range of equipment such as sanitary pumps, plate heat exchangers and decanter centrifuges for various applications like sodium lauryl ether sulfate (SLES) production and wastewater (sludge treatment).

When in 2010 Galaxy needed MBR for biological treatment of industrial wastewater at two new units at Jhagadia in Gujarat and in Egypt, Alfa Laval India's wastewater treatment specialists suggested that Galaxy should consider Alfa Laval hollow sheet membrane filtration modules (MFMs) for the new projects. The all-in-one MBR system combines secondary and tertiary wastewater treatment, and delivers a superior effluent quality. It offers trouble-free, gravity driven operation with no manpower or pump requirements and very little instrumentation.

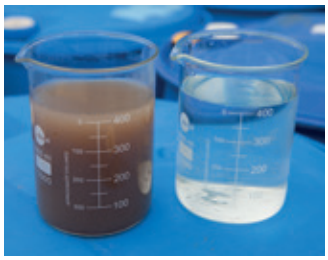
Tough conditions imposed

Galaxy already had an MBR from another supplier installed at its Taloja factory in 2009 and was satisfied with the performance achieved. Accordingly, the company stated that if they were to even consider Alfa Laval membrane filtration modules, they must first see six months' uninterrupted trials with better performance than their existing solution.

Galaxy agreed to conduct a pilot test at their existing facility with our hollow sheet membrane module running side-by-side with their existing flat sheet MBR solution.

Performance exceeded expectations

The six months uninterrupted pilot test was performed in 2010 with data collected every two hours. As the results below show, the Alfa Laval MBR modules not only met but by far exceeded the Galaxy's performance requirements:

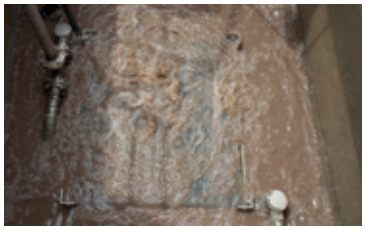


Parameters	Authorized level	Levels obtained with Alfa Laval MBR
BOD5 (Biochemical Oxygen Demand)	<10	5
COD (Chemical Oxygen Demand)	<250	35
SS (Suspended Solids)	<100	5

The test results convinced Galaxy Surfactants that it was a better solution than their existing flat sheet membranes. They therefore decided to place the order for the two new MBR plants with Alfa Laval:

- 2 MFM 100 modules with a total capacity of 100 m^3/day were installed at Galaxy's plant in Jhagadia, Gujarat, in India
- 4 MFM 100 modules were installed at Galaxy's plant in Egypt.

In 2014 the company repeated the order with 2 MFM 100 modules for their plant in Tarapur, India, for a 120 m^3/day plant, which involved converting an existing secondary settling plant to an MBR plant. Unlike the simple efllunt at Galaxy's Taloja factory, the challange at Tarapur was to treat the effluent coming from batch process and multiple process. Therefore, Galaxy wanted to have MBR treatment of the complex industrial effleunt. Another challenge at Tarapur was to install the Alfa Laval membrane modules in the existing tank without stopping the plant. The entire operation went smoothly.



A view inside a tank with an Alfa Laval MBR module treating wastewater from speciality chemicals

"The Alfa laval membranes required only a small area and provided better service," says Mr. Yogesh Sankhe, Sr. Executive SHE, Galaxy Surfactants.

Use of wastewater for cooling tower water (future plan)

In total, eight MFM100 membrane filtration modules are now treating the industrial wastewater at Galaxy Surfactants. Since the Alfa Laval membranes deliver very clean, good quality water, Galaxy also decided to go for reverse osmosis (RO) as a final polishing step. This will enable them to reuse the treated, recycled water in cooling towers – thereby successfully pursuing their zero liquid discharge (ZLD) strategy and saving fresh water resources.

The Alfa Laval MBR system helps Galaxy Surfactants fulfil their 2011-2015 sustainability goals: Water reduction 25%; waste reduction 50%.

Reduced water consumption (m^3) at Galaxy's Tarapur factory thanks to reuse of treated wastewater	
With conventional tertiary treatment (before)	0%
After biological treatment with MBR	5%
After addition of reverse osmosis (future)	30 – 40%

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com

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