

Multi-tech Approach to Achieve MLD Case Study: Textile Industry in Mexico



Introduction

In Yucatán, Mexico, a fabric and apparel manufacturer is looking to improve their sustainability goals to be able to reduce the amount of water used per kilogram of textile produced.

In order to achieve this goal, the factory has implemented a project to achieve Minimal Liquid Discharge (MLD) to maximize wastewater recovery for reuse and eliminate water discharge to the environment.

Vertical Knits is committed to increasing their positive impact on our planet, one person, one t-shirt and one community at a time. As they have grown, so has their commitment to reduce the environmental footprint on our planet. Their vision is to elevate their employees, customers, suppliers and the community to become innovators, leaders and contributors of an inclusive society and a healthy environment.

Their comprehensive approach towards reducing their environmental impact means looking at all aspects of the business, how they intersect and how they can integrate new solutions to create meaningful and sustained change, such as adopting energy-efficient processes and controls, reducing the energy and water use and improving the waste and water recycling.

The Challenge

The region's textile industry has been employing Minimal Liquid Discharge (MLD) using reverse osmosis (RO) followed by evaporation for more than a decade to meet local zero liquid discharge (ZLD) requirements. Using a hybrid MLD-ZLD process lowers the cost of traditional thermal ZLD by up to 60%, but the costs are still more than wastewater management costs of other textile factories around the world where ZLD is not required. To remain competitive in the world's textile market, wastewater treatment costs must be further reduced. Innovative membrane technology to push the MLD process more and reduce the volume of water needing thermal treatment is needed to achieve this cost benefit.

The Solution

In order to achieve their sustainability goals and remain competitive in the market, the end-user implemented a membrane-based, multi-tech solution that consists of treating the wastewater first through membrane bioreactor (MBR) process using MEMCOR® B40N MBR modules. The permeate is then collected and fed to a reverse osmosis (RO) system that uses a combination of FilmTec™ Fortilife™ CR100, XC70, and XC80 elements to achieve a recovery of 85%.

The RO concentrate is then fed to a nanofiltration (NF) system using FilmTec™ Fortilife™ XC-N to increase overall water recovery. The permeate of the RO system is reused within the process, whereas the permeate of the NF system is recycled to the feed of the RO system.

The process train has an overall water recovery of 93%.

Fast Facts

Location:
Yucatán, Mexico

Commissioning:
2019

Application:
Minimum Liquid Discharge

Water Type:
Wastewater

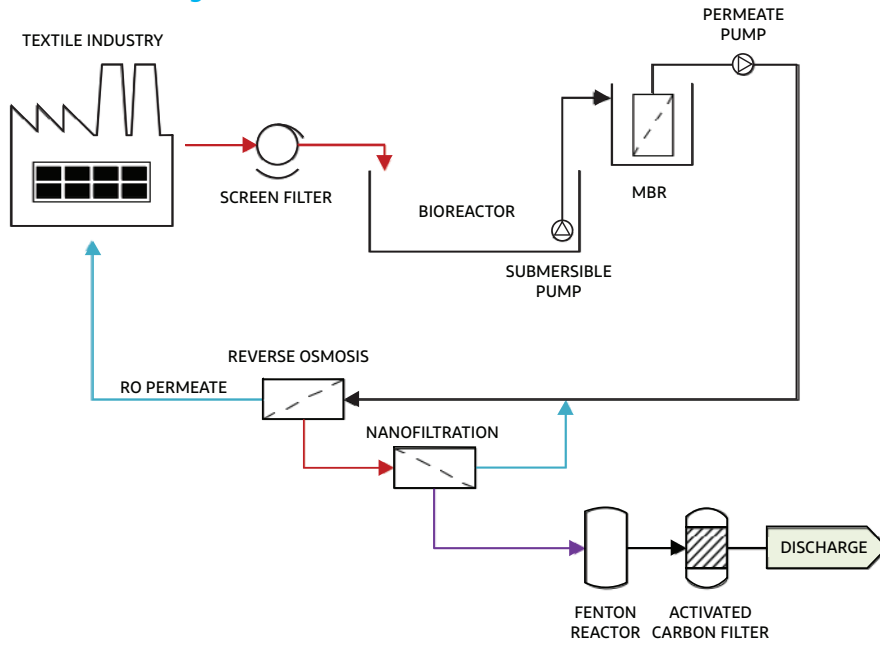
Capacity:
1000 m³/day

Contractor / End User:
Vertical Knits

Technologies:
MBR, Reverse Osmosis,
Nanofiltration

Products:
MEMCOR® B40N MBR,
FilmTec™ Fortilife™ CR100,
FilmTec™ Fortilife™ XC70,
FilmTec™ Fortilife™ XC80,
FilmTec™ Fortilife™ XC-N

Process Flow Diagram



MBR



Reverse Osmosis system



Nanofiltration system

*Source for Aladyr Award, click [here](#).



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