

PROJECT REFERENCE

Automotive Industry

MBR WASTEWATER TREATMENT

Project Details

Location:	Turkey
OEM Partner:	Ovivo Water GmbH
Product:	B-SMART™
Produced permeate:	740 m ³ /day
COD influent:	1.000 – 1.500 mg/L
Membrane type:	8 mm PVDF, backwashable

Project Overview

Ovivo Water was contracted to design a wastewater treatment system for a large tractor manufacturer in Turkey. The factory produces two wastewater streams: **(1) industrial wastewater** containing oil and metals with a high COD concentration, and **(2) common wastewater** stream containing high levels of organic matter from the factory's 3.000 employees.

The volume and strength of the combined wastewater vary considerably from day to day.



Picture 1. Physical chemical treatment plant

The Challenge

The tractor factory produces varying qualities of wastewater, generated by the multiple production processes:

- Paint shop
- Transmission
- Assembling line
- Lathe tools machine
- Sewage from employee facilities



Picture 2. B-SMART™ self-regulating UF system

Ovivo Water worked with **Berghof Membranes** to develop an efficient and cost-effective system that could handle the challenging feed streams that varied in both volume and quality.

Of course, the system needed to be robust enough to handle the **high-strength wastewater**, concentrate the waste matter to a level suitable for discharge, and produce permeate suitable for partial reuse in the factory.

The Berghof Membranes Solution

With 50 years of experience in tubular PVDF membrane technology and industrial effluent treatment, Berghof Membranes has developed a compact external MBR treatment technology, called **B-SMART™**, that adapts to the varying volume of wastewater in the tractor factory.

The two initial wastewater streams are pretreated separately:

- The **industrial stream** is pretreated with a complete physical chemical treatment to remove oils and heavy metals.
- The **sewage stream** first passes through a strainer to remove large coarse solids, then through a filter to separate fibers and smaller particles, and then the final stage to remove oils and grease.

The two streams are then mixed and sent to the **membrane bioreactor (MBR)** in order to reduce the organic load of the wastewater. A portion of the permeate is re-used for the internal facilities of the factory, and the rest is discharged directly to the municipality.

The **B-SMART external MBR** achieves a complete retention of the biomass in the aerobic reactor and delivers significant improvement of the digestion process. This advanced technology features an intelligent combination of variable crossflow velocity, backwashing, chemical-enhanced backwash and cleaning-in-place (CIP).

The **software analyzes the system in real-time** and automatically adjusts the parameters based on the conditions of the feed stream, ensuring smooth and continuous operation.



Picture 3. Berghof Membranes tubular UF modules

The B-SMART™ System

Based on a **side-stream ultrafiltration system** located **outside the bioreactor (the external principle)**, the Berghof Membranes B-SMART self-regulating system uses high-quality tubular membrane modules. The system

Customer benefits

- **Small footprint**
- **Fully automated operation**
- **Robust and compact**
- **Good scaling control**
- **Superior effluent quality for discharge to municipality**
- **Complete retention of the biomass**
- **Easy cleaning and maintenance**
- **Improved digestion process**

For a challenging feed stream that varied in both volume and quality, the **self-regulating B-SMART external MBR system** from Berghof Membranes proved to be a suitable and innovative solution.

is self-regulating and therefore **consumes less energy**. The proprietary built-in software system analyses data in real time using advanced algorithms based on transmembrane pressure (TMP) to control pump speed, backwash and cleaning frequency.

The filtration system automatically monitors the individual TMP and automatically initiates the cleaning procedure if it exceeds defined limits as a result of fouling. Depending on the need, the system selects one of the cleaning modes to eliminate fouling: **(1) increased cross-flow velocity**, **(2) backwash with/without chemicals**, or **(3) flushing or cleaning-in-place (CIP)**.

Once cleaning is completed, **the system automatically checks the TMP values** again and applies additional cleaning protocols if the set-point value is not reached. Additionally, the unit can continue to produce a fixed amount of permeate even during the backwash process.

The **Berghof Membranes B-SMART self-regulating external filtration system** treats wastewater streams at a cross-flow velocity of 1,5 – 2,5 m/s and a flux range of 50 – 100 LMH. All this combined ensures **less energy**, **reduced maintenance time** and **improved OPEX**.

See more

- MBR Technology - www.berghofmembranes.com/mbr
- Ovivo Water - www.ovivowater.com



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