PROJECT REFERENCE

Automotive Industry

MBR Wastewater Treatment

Project Details

Location:	Philippines
Product:	Tubular UF membranes
Produced permeate:	>20 m^3/hour
Membrane type:	8 mm PVDF, backwashable

Project Overview

A leading car factory needed to expand their existing wastewater treatment system at one of their manufacturing facilities located in the Philippines (see picture 1). The existing conventional activated sludge system was unable to handle the higher flow rate and urgently needed an upgrade.

The Challenge

Due to Philippine land restrictions, the company was not permitted to expand beyond the existing wastewater treatment area. After a comprehensive review of various technologies and options, the car manufacturer awarded the project to a local OEM for their external tubular membrane solution from Berghof Membranes. The main reason for awarding this project was that the technology enabled the end-user to generate a bigger flow without expanding the existing footprint.

The wastewater stream generated by the automotive plant varied in characteristics and strength as it included discharge streams from various sectors within the plant. These sectors included:

- painting bath
- assembling
- ED coating
- chassis
- phosphating
- welding
- degreasing
- scrap yard
- others (cooling tower, boiler, sanitary)

The different streams were processed in separate units (i.e. coagulation / flocculation, dissolved air flotation, sedimentation) before the final stage in a biological treatment unit.

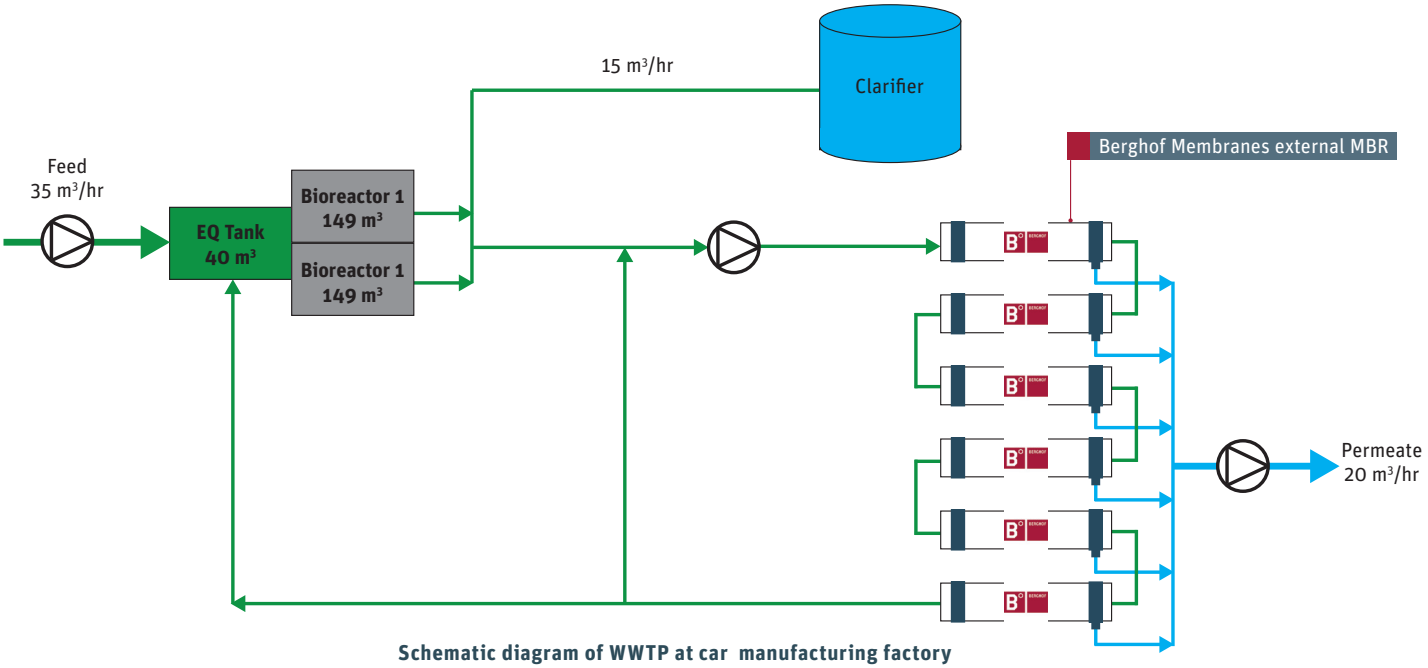
The previous biological treatment design was a conventional activated sludge process with two aeration basins, each 150 m^3, positioned in parallel to provide a total volume of 300 m^3 for the bioreactor. After the aeration system, wastewater from both basins flowed towards a common clarifier to separate the effluent and sludge.

The Berghof Membranes Solution

The sludge of the membrane bioreactor (MBR) was separated by External Ultrafiltration of Berghof Membranes. The system was designed as a single loop with 6 modules in series. To leverage the footprint of the existing wastewater treatment system, the skid was positioned on top of the aeration tank (see picture 3).

Picture 1: Main entrance to onsite WWT plant.

Aside from the small footprint of the ultrafiltration system itself, the winning technology is able to concentrate double the amount of biomass, which enabled the use of a smaller bioreactor for the end-user.



Schematic diagram of WWTP at car manufacturing factory

The diagram above is a representation of the project winning schematic presented by the OEM to the client - a schematic that features the external MBR technology coupled with Berghof Membranes. The table below shows the target process parameters.

Parameters	Influent	Required Effluent
Feed Flow rate, m³/h	35	20
COD, mg/L	827.5	≤20
BOD, mg/L	305	≤10
TSS, mg/L	147	≤15
pH	8.5	6.5 - 8.5

The Berghof UF skid achieved a constant flow rate greater than the original target of 20 m³/h. The flux has remained stable in the range of 65 LMH, while the system's crossflow velocity has been between 1.5 - 2.4 m/s.

The permeate has successfully met the effluent discharge standards and is partially reused for the manufacturing facility's cooling tower and other general processes. The excess water is discharged to the river nearby and the thickened sludge is transported with trucks after being belt pressed and dried.

Picture 2: Photo of the Berghof Membranes skid positioned above the plant's aeration tank

About Berghof Membranes

Berghof Membrane Technology GmbH, part of the Berghof Group, is the leading manufacturer of tubular membranes for the filtration and separation of process streams and wastewater in a variety of industries including dairy, landfills, food & beverage, chemical, pharmaceutical, and oil & gas.

We at Berghof Membranes continuously "think outside the box" by not only offering tubular membrane modules, but we also delivery engineered filtration systems and support services to our OEM partners. From lab-scale testing, to piloting, to engineering design, to commissioning, to remote monitoring and analysis, to replace parts - we're more than just a membrane supplier.

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