

Automotive Plant Wash Water

Case Studies and Field Trials



Challenge

An automotive parts manufacturer producing millions of parts per year was seeking to remove cutting fluid/oil and suspended solids from water used in its parts-washing process to enable water recycling and reuse in the parts washer. The company's existing tubular membrane system did not condition the parts water to a desired quality for reuse and required supplemental expensive and time-consuming bag filtration to meet discharge limits. In addition, increasing pressure from local municipal authorities to reduce overall amount of water discharged to the public water system forced the company to investigate better performance through new technologies.



Solution

One of PPG's systems integrator partners responded to the company's request for proposal and introduced PPG's ultrafiltration (UF) membrane element as a potential solution. The manufacturer requested lab testing to validate the potential of purifying and recovering its wastewater to the highest achievable rates using the proposed solution. Successful lab testing and trials enabled the system integrator to win the project and install full-scale systems utilizing PPG's UF membrane element.



Results

During lab testing, the wastewater feed was circulated through a PPG 2514 UF membrane element. After reaching stable flux the solution was concentrated to the customer's target of 10% of the initial volume (see **Figure 1**). The feed had an initial oil and grease concentration of 450 ppm which was reduced to 26 ppm in the permeate. The solution was then concentrated down to 4% of the initial volume while maintaining permeate quality.

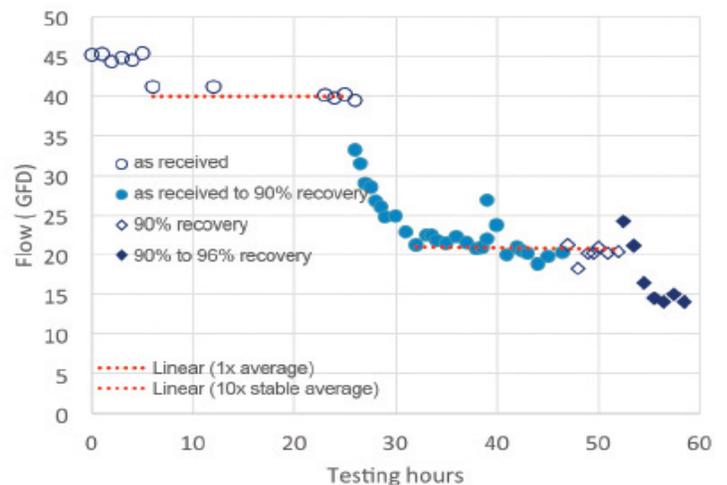


Figure 1
Flow Change with Time

The spiral wound filter with the high-flux polymeric membrane significantly reduced the percentage of total suspended solids (TSS) and oil and grease while slightly reducing conductivity and showing no change in pH value.

The permeate and feed appearance at 90 percent clean-permeate recovery is shown in **Figure 2**.

Conclusion and Summary

The PPG membrane element demonstrated exceptional performance, generating permeate quality that met or exceeded the parts manufacturer's target and maintenance-stable flux rates. The high-flux polymeric membrane also produced clean permeate water at a recovery rate of greater than 90 percent.

After the successful lab testing, the full scale system was installed in January 2018 in 14 of their 18 production lines. The elements have continued to perform at or above expectation for more than 14 months. The 4 remaining legacy systems will be converted to PPG UF membrane technology.



Figure 2
Comparison of Feed and Permeate Appearance

The specifications for this product are the dimensions and element properties identified on this Product Data Sheet. The operating parameters on this Product Data Sheet are based upon information believed by PPG to be currently accurate; however, PPG makes no representations or warranties regarding the accuracy of the operating parameters or any other information on this Product Data Sheet. PPG also makes no representations or warranties regarding the performance or results of this product, or regarding freedom from patent infringement in the use of any formulae or process on this Product Data Sheet. Improvements in filtration technology may cause operating parameters to vary from what is on this Product Data Sheet.