

PPG Ultrafiltration Membranes Outlast, Outperform Incumbent Products at E-Coat Facility

Case Studies and Field Trials



Challenge

PPG Coatings Services' Lebanon, Tennessee, plant operates a single black epoxy electrocoat (e-coat) line, which coats products for a major automotive brand. E-coat is a popular choice for leading industry OEM's due to its low total applied costs, high-performance and environmental advantages. In 2017, the facility switched the line to a new paint formulation. As part of that transition, plant management also decided to trial a new spiral wound ultrafiltration (UF) membrane developed by PPG, using it to replace the incumbent UF membrane it had historically deployed in its closed-loop e-coat rinse system.



Solution

The Lebanon facility began replacing the incumbent UF membrane with the PPG membrane in December 2017. The plant's 12,000-gallon e-coat tank is serviced by a two-cartridge array of spiral-wound 7640 UF membranes. Activated by flow and pressure, the membranes function as part of the e-coat system to recover paint, purge the tank of ionic contamination and reduce conductivity to generate the clean permeate that rinses coated parts.

"Quality and efficiency are a fundamental focus of our plant's e-coat operations. PPG's UF membranes last longer than the filters we used to use, mostly because they have higher flux rates and better cleanability. The flux rate of the PPG filter slows after each cleaning cycle – as it did with the previous filters – but the decline is slower and more gradual. The result is longer service life for the filters, which means less downtime, increased production, and lower material and maintenance costs for our paint line."

PAUL POUGET
Plant Manager, Lebanon
PPG Coating Services



Results

PPG's plant management noted an immediate increase in permeate throughput, which jumped from about 3.5 gallons per minute (GPM) per filter with the incumbent membrane to more than 4.5 GPM with the PPG UF membrane.

Two additional benefits became apparent after extended use of the PPG membrane: enhanced cleanability (as expressed by flux rate) and longer service life. According to Lebanon's plant manager, flux rates from the e-coat tank with the incumbent UF filter would traditionally drop to about seven on a scale of 10 prior to the first cleaning cycle, then step back up to eight after the initial cleaning. The flux rate would then steadily diminish with each subsequent cleaning cycle.

Because they achieve higher flux rates out of the box, PPG UF membranes not only last longer than the incumbent product, they also retain a higher percentage of their initial flux rate after each cleaning cycle. While the PPG filters' performance levels also diminish with each cleaning cycle, the decline is slower and more gradual than that of the incumbent membrane system. As a result, PPG UF filter elements consistently provide longer service lives than the incumbent filters, leading to less downtime, increased production and lower material and maintenance costs.



PPG filter element.

Following its successful trialing at the Lebanon plant, PPG UF membranes were gradually installed at other PPG Coatings Services plants throughout the U.S. To date, they have produced more than 100,000 failure-free run hours at 15 PPG Coatings Services locations.

To learn more about this application, or for more information about the unique benefits of PPG UF filtration membranes, visit www.ppgfiltration.com.

Conclusion and Summary: Why It Works

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