

## CASE STUDY

# Success Story - Renewable Fuels



PCSRFEN

## Introduction

The growth in renewable fuels capacities to meet environmental and social policies is causing producers to scale up volumes of animal and vegetable feedstock being used in coprocessing and standard alone renewal fuel sites.

A key challenge for scale up is the difficult contamination issues affecting reactors, equipment and overwilling conventional filtration units. These contamination related pain points faced by renewable fuels producers are driving up OPEX, wasting valuable feedstock and reducing profitability of sites attempting to implement green technologies.

Maintaining reliable, long-running filter campaigns is essential to operational efficiency. Frequent filter change-outs not only increase consumable costs but also introduce risk of process disruption, potential contamination during element handling, and significant maintenance labor burden on operations teams.

At a renewable fuel site in Brazil with a renewable feedstock capacity of approximately 9 thousand b/d the site was struggling with the issue of increased contamination over welling the existing filtration units. OPEX at the facility had increased greatly due to the addition of renewable feedstock such as Used Cooking Oil (UCO), and animal fats due to the short life on the consumable filter element which in some instances was as low as 4 hours.

## Challenge

**Prior to engaging Pall, this renewable fuel site was operating with conventional cartridge filters paired with a standard disc-type polishing filter. The performance of these incumbent elements significantly limiting operational efficiency:**

- Filter campaigns lasted on average only 8 hours under high-load conditions, requiring three complete filter change-outs every 24 hours - a labor-intensive, costly, and disruptive routine.
- Under normal load conditions with a high decantation tank level, campaign life improved to 3-4 days, but this was inconsistent and difficult to predict.
- The conventional element utilizing fan-pleat technology were susceptible to uneven flow distribution and pleat bunching, reducing effective filtration area and accelerating pressure drop build-up.



**Maintaining reliable, long-running filter campaigns is essential to operational efficiency.**

- The competitive disc-type polishing filter lacked robust backwash capability, meaning that once elements reached end-of-life differential pressure, they had to be replaced rather than recovered.
- The combined effect was high consumable spend, increased waste disposal costs, and operational uncertainty - all key pain points for both process engineering and procurement teams.

The site's engineering team set a clear target: achieve a consistent 3-4 day campaign under normal conditions while maintaining outlet contamination well below the 24 ppm limit — without compromising process reliability.

## Solution

**Pall conducted a structured field trial over 9 days (September 29 – October 7, 2025), installing its High Flow Vector cartridge filter elements and SUPRADisc II depth-disc polishing filter modules in one production line while the incumbent filters continued to run in parallel for direct performance comparison.**

See over >

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## High Flow Vector Pre-Filter

The Pall High Flow Vector element uses a patented pleat geometry that delivers up to 50% more filtration surface area versus conventional fan-pleat designs. Uniform pleat spacing ensures even flow distribution across the entire element length, eliminating the preferential flow channeling and pleat bunching that shortens competitor element life. The larger pressure differential headroom (from initial to terminal  $\Delta P$ ) translates directly into longer campaign life before change-out is required.

## SUPRADisc II Polishing Filter

The Pall SUPRADisc II module combines the proven depth-filtration performance of Seitz® filter media with a robust dual-drainage plate construction. This structural design withstands backwash pressures up to 1 bar - a capability the incumbent system lacked entirely. Backwash recovery extends element life beyond what is achievable with replacement-only strategies and reduces total consumable consumption.

*The table (right) summarizes the head-to-head performance comparison observed during the trial:*

| Criteria                    | Previous Approach                       | Pall Solution                    |
|-----------------------------|-----------------------------------------|----------------------------------|
| Filter technology           | Conventional fan-pleat HF + disc filter | <b>Vector + SUPRADisc II</b>     |
| Campaign duration           | <b>8 hours at high load</b>             | <b>4+ days (same conditions)</b> |
| Backwash capability         | <b>Not supported</b>                    | <b>Yes - up to 1 bar</b>         |
| Outlet contamination        | Frequent limit exceedances              | <b>Consistently &lt;3.5 ppm</b>  |
| Element integrity after use | Fully saturated within shift            | <b>No damage after 4 days</b>    |

**On Line 2** - the best-performing configuration with no vessel bypass issues - the Pall Vector elements ran for a full 4 days before removal, compared to 8-hour campaigns for the incumbent elements removed the prior day. Inlet contamination during the trial ranged from 1.99 to 72.29 ppm; the SUPRADisc II consistently delivered outlet quality of 1.5-3.5 ppm - well within the 24 ppm product specification. Elements removed after 4 days showed thorough solid loading but zero structural damage, confirming the integrity of Pall's construction under demanding real-world conditions.

## CONCLUSION

This field trial demonstrates that Pall's High Flow Vector and SUPRADisc II filtration system can transform Renewable feedstock filtration operations — extending filter campaign life from 8 hours to 4 or more days, slashing change-out frequency by up to 75%, and delivering consistently clean product output well below contamination limits. The SUPRADisc II's backwash capability opens the door to further campaign extension as operational experience grows.

*If your renewable fuel operation is facing any of the following challenges, Pall's application engineering team can help:*

- Frequent filter change-outs driving up consumable and maintenance costs
- Inconsistent product quality at the polishing filter outlet
- High operational burden from unplanned filter interventions
- Looking to reduce solid waste volumes from spent filter elements
- Interest in qualifying a backwash-capable final polishing filter to extend campaign life



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