

# Expanding Flexibility in Biotech Flow Cells with PPSU for Single-Use Applications

## OVERVIEW

A global biotech instrumentation company partnered with Lehigh Valley Plastics to introduce a single-use alternative to their traditional stainless-steel flow cells used in spectrophotometer systems. While the original stainless-steel components remain ideal for multi-use settings, customers in GMP-regulated and high-throughput environments were seeking a disposable, contamination-resistant solution that aligned with evolving lab protocols and single-use trends.

## CUSTOMER CHALLENGES

- **Demand for Single-Use Options:** Increasing customer preference for disposable components to minimize cleaning validation and contamination risks.
- **Cross-Contamination Concerns:** Reusable metal flow cells introduced the potential for carryover, especially in sensitive or regulated testing environments.
- **Labor and Cleaning Burden:** Stainless-steel assemblies required time-consuming cleaning between runs, impacting workflow efficiency.
- **Dimensional Stability Requirements:** The new plastic flow cell needed to maintain the same dimensional accuracy and consistency as the stainless-steel version to ensure reliable spectrophotometric readings.



## LVP SOLUTION

Lehigh Valley Plastics recommended Polyphenylsulfone (PPSU) as the ideal material for a new single-use flow cell design. PPSU offers exceptional chemical resistance, dimensional stability, and thermal performance, making it well-suited for demanding biotech and diagnostic applications.

## KEY BENEFITS OF PPSU FLOW CELLS INCLUDED:

- **Single-Use Compatibility**, eliminating cleaning and reducing the risk of cross-contamination
- **Excellent Chemical Resistance**, withstanding aggressive reagents and sterilants
- **High Heat Resistance**, enabling autoclaving and other sterilization processes without deformation
- **Biocompatible and Regulatory-Compliant**, supporting use in sensitive biological applications
- **Dimensional Stability**, preserving accuracy in spectrophotometric readings

Working closely with the customer's engineering team, LVP machined the new PPSU flow cells to mirror the performance and geometry of the stainless-steel version, ensuring full system compatibility and ease of integration.

## RESULTS

- **Expanded Product Offering** with both reusable and single-use flow cell options
- **Enhanced Market Reach** by catering to both traditional labs and single-use facilities
- **Reduced Risk of Contamination** in regulated and sensitive workflows
- **Faster Turnaround** for labs leveraging disposables, minimizing cleaning time

## CONCLUSION

By adding a PPSU single-use flow cell option alongside the original stainless-steel design, our customer provided greater flexibility for their end users, meeting the evolving needs of modern biotech labs. Lehigh Valley Plastics delivered a turnkey solution with expert material guidance, precision machining, and compliance-focused support, helping our partner stay ahead in a competitive, innovation-driven market.