



Technology That Loves Complexity

 Brochure

# Aspen ProMV™



Aspen ProMV analyzes interrelated process data to identify the minimum critical set of variables driving the quality and performance of the process and identifies optimal setpoints.

### **Applications**

- Quality deviation analysis
- Unit yield analysis
- Production capacity degradation analysis
- Offline multivariate analysis (discovery and optimization of key variables)
- Online multivariate analysis (monitoring and troubleshooting)
- Batch process variability analysis

### **Key Capabilities**

- Continuous or batch process optimization
- Online batch multivariate analysis
- Automated batch data alignment

## **Over 3% Total Production Value Is Lost to High Variability**

Finding sources of variation in production processes is difficult when all the variables are correlated. In the process industries, all the variables tend to move at once. Separating cause from effect is difficult with traditional tools because the underlying mathematics make the worst assumption possible: that the sources of variation are independent.

# You Can't Solve Big Data Problems With Small Data Tools and Skills

Aspen ProMV helps you find the real underlying sources of variation in production processes. Multivariate analysis converts the original set of input variables to a smaller set of latent variables. These latent variables are orthogonal pseudo-variables that are easier to analyze.

## Map your operating space from available plant data

Aspen ProMV exploits the tens of thousands of recorded “experiments” in your plant historian to develop a robust model of the process that can predict plant performance at different operating points.

## Stabilize quality, yield and productivity

Understand and remedy the causes of recurring process upsets. Find key patterns of movement in process variables that trigger undesirable outcomes. Insights gained often lead to significant operational improvements.

## Persist these improvements via online multivariate monitoring

Sensitively detect and diagnose subtle shifts from optimal process operation. Aspen ProMV enables early, informed intervention by operations personnel.



## Customer Successes With Aspen ProMV

At one plant, Aspen ProMV technology was used to discover the cause for low drop-in monomer recovery in a train of continuous distillation columns and determine the corrective action needed to move recovery from 75 percent back to 91 percent. It identified the need to add a temperature controller for a specific tray in one of the 12 distillation columns. Using traditional data analysis and process experience, the plant personnel had not been able to discover the cause or corrective action after six weeks of analysis, and the plant had been losing \$100,000 per week in wasted monomer.

At FMC Corporation, Aspen ProMV technology was also able to determine that simple changes in the standard operating procedures for a batch herbicide process could rescue close to 50 percent of their production that had previously been out of specification. For years plant personnel had thought the problem was in the chemical composition of the raw materials, but the Aspen ProMV analysis showed that batch size and rate of heat input were the culprits — and showed how to adjust these settings to avoid undesirable chemical byproducts. Rescuing 50 percent of production was worth millions of dollars per year.

Aspen ProMV technology was implemented in-house at Mitsubishi Chemicals to provide automated predictive control of a batch emulsion polymer process. This implementation halved the variability in particle size, the critical quality attribute, and eliminated all off-specification batches (that had been running at 10-15 percent of production).

Aspen ProMV technology was implemented at a Fortune 100 food manufacturer for control of their batch process. Variability in the critical quality attributes was cut in half, and the plant production capacity was elevated by 12 percent. This production boost went straight to the bottom line by delaying the need to invest capital in additional production lines for this growth brand.





## Built for the Process Industries

1. Improve understanding of the process variable relationships by analyzing historical plant data. We can understand how the process variables tend to move together in specific patterns and how this affects the product quality, yield and productivity.
2. Troubleshoot the root cause of process operating problems by analyzing historical plant data. For this use case, we can look at contribution plots between good and bad modes of operation to understand which physical variables significantly contribute to the shift.
3. Leverage powerful analysis tools for batch manufacturing. Aspen ProMV is possibly the only empirical modeling tool to really treat batch analysis well. A key reason is that it readily handles the strong autocorrelation across time for batch trajectory variables, in addition to the cross correlation between variables. It includes highly automated features for alignment of data from variable length batches.

AspenTech is a leading software supplier for optimizing asset performance. Our products thrive in complex, industrial environments where it is critical to optimize the asset design, operation and maintenance lifecycle. AspenTech uniquely combines decades of process modeling expertise with machine learning. Our purpose-built software platform automates knowledge work and builds sustainable competitive advantage by delivering high returns over the entire asset lifecycle. As a result, companies in capital-intensive industries can maximize uptime and push the limits of performance, running their assets faster, safer, longer and greener.

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