

The Laminar Self-Driving Factory

# Laminar Runs Agile Breweries



Laminar's Physical AI & Process-Aware Sensors easily retrofit into your brewery to power self-driving processes. Every Laminar Line unlocks hidden production capacity and bolsters your agility.

**Reclaim time from Clean-in-Place. Bottle more beer.**

- CIP overwash unnecessarily extends cleaning time and reduces available production time.
- Filtration downtime and filter cleaning interrupt production runs and reduce throughput.
- More flavors and SKUs create more changeovers, rinse steps, and cleaning cycles across the brewery.

JOIN THE LEADING GLOBAL BREWERIES REDUCING UTILITIES AND GAINING AGILITY

**15%**

Time saved from CIP cycles

**20%**

Water saved from CIP rinse cycles

**15%**

Chemical and caustic waste reduction

**<1 year**

Return on investment



Andre Fourie

VP of Sustainability

"AB InBev is leveraging digital tools to support our work in water stewardship. [We] piloted an approach in our Leuven Brewery in Belgium...leveraging a network of sensors to collect water use data in real time and deliver efficiency solutions through an AI-powered platform.

[Laminar enables] us to reduce water usage in our brewing operations. The successful pilot with [Laminar] is being rolled out to a number of breweries across the business."

IMPROVE PRODUCTIVITY AND SUSTAINABILITY WITH LAMINAR LINES



**Faster CIP on Tanks, Brewhouses, & Fillers**

End cycles the moment residue clears — not when a worst-case timer expires.



**Faster Product Changeovers**

Recover product waste at both the tail and head of every batch transition and run faster changeovers.



**Chemical Use Reduction**

Reduce chemical overdose and unnecessary caustic loss caused by limited visibility into chemical degradation.



**Filtration & Kieselguhr Optimization**

Stabilize filtration conditions to reduce Delta P spikes, extend filtration runtime, reduce Kieselguhr consumption, and minimize filter CIP cycles.



**Water Waste Reduction**

Reduce the water used during rinse steps by only running each rinse step only as long as needed.



**Production Capacity Recovery**

Reduce operational downtime across cleaning, filtration, and transitions to create more available production time without adding new infrastructure.

Trusted By



# Laminar CIP & Changeovers for Breweries



## LAMINAR PROCESS AWARE AUTOMATION

SENSE • REASON • ACT

### 01 SENSE



#### See Real-Time Fluid Conditions

Inline signals from Process Aware Sensors extract real-time liquid data. The platform measures what is actually happening in the pipe, every second, without taking samples or stopping the process.

### 02 REASON

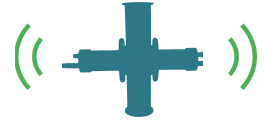
Clean Achieved

Step Advance

#### Automate the Optimal Action

Process-Aware Modeling, grounded in chemistry, uses real-time compositional state and process condition to find the best probability for success on every cycle. The model evaluates the current state of the process against the optimal trajectory and computes what to do next.

### 03 ACT



#### Self-driving Takes Over

The platform turns collected process information into value with instant operational action via the PLC. It commands valves, steps, dosing, diversion, release, or correction — closing the loop in seconds rather than at the next scheduled batch review.

## LAMINAR'S PROCESS-AWARE AI IS COMPRISED OF A FULL ML LIBRARY OF FOUNDATIONAL MODELS THAT MOVE THE INDUSTRY STANDARDS OF TODAY FORWARD.

### READY TO DEPLOY FOUNDATIONAL ML MODELS

#### Self-Driving Clean-In-Place (CIP) Model

Automatically advances CIP steps when clean is achieved. Eliminates overwash and underwash instances. Reduces time spent on CIP cycles while meeting quality standards.

#### Self-Driving Product Changeover Model

Detects the exact product-to-product or product-water transition interface— reducing product loss at the tail and head of every run. Also reduces water and chemicals.

### FULL ML MODEL LIBRARY

- Chemical Savings Models

Chemical Reclaim

Chemical Overdose

- Emulsification
- Underwash Detection
- Filtration

### Process Aware Sensors



Clamps onto existing production lines, no plumbing changes. Laminar sensors read liquid conditions continuously and sends spectral data in real time to our Process Aware AI, without removing samples or stopping the process.

### Process Aware AI



Our ready-to-deploy ML models are process-aware because they reason about the chemistry and condition of the fluid in the pipe, rather than against the static thresholds set during commissioning.

### Process Aware Platform

Automation is active

Water savings >  
**1,140 gal**  
0 gal actualized  
1,140 gal projected

**21%**

Time savings >  
**3h 23s**  
0s actualized  
3h 23s projected

**16%**

#### Capabilities

- Total Savings Insights
- Inefficiency & Anomaly Detection
- Batch Records on Each Run & Line
- Trend Analysis for Savings Opportunities

Ready to save production time, chemicals, and water?

Talk to our team today!



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