SmartFlow Technologies

HSTFF™

HIGH SOLIDS TANGENTIAL FLOW FILTRATION

MAINTAIN THROUGHPUT AND CLARITY EVEN IN VISCOUS, PARTICLE-RICH STREAMS WHILE OPERATING AT HIGH TEMPERATURES

HSTFF™

HIGH SOLIDS TANGENTIAL FLOW FILTRATION

SmartFlow Technologies' High-Solids Tangential Flow Filtration (HSTFF™) platform enables stable, high-solids processing across a wide range of industrial applications—from corn-ethanol stillage to advanced fermentation and dairy protein concentration.

Built on SmartFlow's patented open-channel architecture, HSTFF™ maintains throughput and clarity even in viscous, particle-rich streams while operating at temperatures up to 85 °C (peak of 90 °C) and pH 1–14.

CONSEP® II 11000 MODULE

Up to 85 °C
(peak of 90 °C)

HIGH-SOLIDS
Process High Solids streams without clogging or caking.

FULL CIP
Supports automated cleaning

SmartFlow drives process-specific solutions through disciplined engineering design and proven scale up applied in partnership with our customers.

THIN STILLAGE SOLIDS
(CORN ETHANOL PRODUCTION)

KEY ADVANTAGES

Key benefits of SmartFlow's HSTFF™ include:

- **Extreme-Condition Performance –** Engineered to operate reliably under harsh combinations of temperature, pH, and solids loading.
- **High-Solids Operation –** Processes viscous, abrasive, and high-TSS feeds without plugging or caking.
- **Stable, Repeatable Flux –** Controlled shear and open-channel design sustain performance in continuous, high-load processes.
- **Scalable Platform –** Linear scalability from lab development to full 24/7 production.
- **Full CIP Compatibility –** Supports automated cleaning, caustic recovery loops, and high-temperature sanitization.
- **Circular-Economy Ready –** Recovers valuable co-products and water for reuse or downstream valorization.

KEY APPLICATIONS

Segment	Applications	Benefits
Ethanol Stillage Recovery	Corn ethanol, thin stillage concentration	Boosts evaporator capacity and dryer throughput by up to 20%; lowers energy demand and CO_2 output while generating higher-value co-products.
Dairy Processing	MPC, MPI, WPC, and WPI	Concentrates proteins and removes significant water prior to drying, increasing overall dryer throughput by 10–30% and reducing energy use per pound of finished product.
Precision Fermentation	Biomass harvest, protein or peptide recovery	Enables high-yield biomass recovery and cleaner permeate for downstream processing; simplifies process by combining centrifuge and microfiltration step into one and processing time.

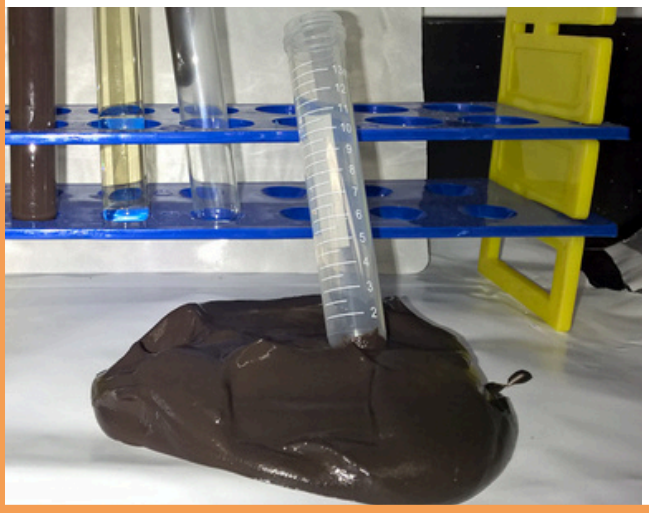
HARSH STREAMS

Up to 85 °C continuous, 90 °C peak and pH range of 1-14

EASY CLEANING

Modules optimized for CIP cleaning

Dewatered Digestate



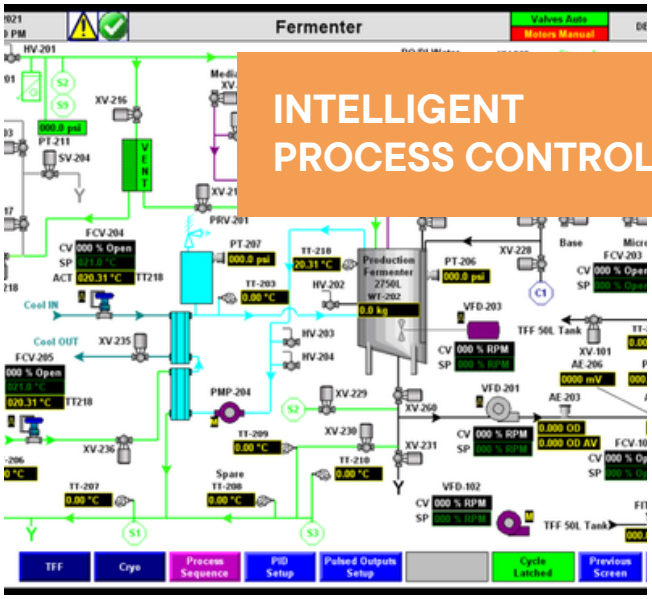
PERFORMANCE ENVELOPE

Parameter	Range
Operating Temperature	up to 85 °C (peak 90 °C)
pH Range	1 – 14
Solids Handling Capacity	Broad range from dilute suspensions to high-viscosity slurries achieving over 95% total solids, measured on a wet weight basis, limited by pump capability.
Typical TMP	10 – 140 psi
Typical Shear Rate	5 000 – 20 000 s^{-1}
Membrane Type	Application-specific

SMARTFLOW'S AUTOMATION SUITE

INTEGRATED AUTOMATION AND CONTROL

SmartFlow's Automation Suite manages filtration, diafiltration, and cleaning within a single, unified platform. The system utilizes Allen-Bradley PLCs and DCS/SCADA architecture with tiered access, providing operators, engineers, and managers visibility and recipe-based sequencing.



Automation Highlights

- Integration into existing site automation and control architectures
- Interfaces with virtually all major control platforms — including Rockwell / Allen-Bradley, Siemens.
- Supports industry-standard communication protocols: Ethernet/IP, Modbus, and OPC-UA
- Enables data exchange and unified plant-wide control

Key Features

- Process specific recipe-driven process and CIP sequencing
- Adjustable setpoints, alarms, and interlocks
- Continuous data logging and remote connectivity
- Consistent, repeatable performance
- Programming and automation based on IEC 61131 standards

SMARTFLOW'S 6-STAGE PROJECT DEVELOPMENT PROGRAM

A structured, low-risk path from goals to full-scale deployment.

The program begins by identifying the goals, defining objectives, and prioritizing opportunities. Feasibility is then verified on actual materials through proof-of-concept testing. From there, SmartFlow develops and optimizes process conditions, membranes, and economics before confirming performance at pilot scale on a right-sized system, supported by SmartFlow's large rental fleet. The pilot data is used to engineer the plant-scale system(s) with appropriate automation, documentation, and commissioning. Finally, the program standardizes performance across multiple facilities and sustains uptime through ongoing support.

LEARN MORE ABOUT OUR 6-STAGE PROGRAM

PREVENTIVE MAINTENANCE AND SERVICE PROGRAM

SmartFlow's Preventive Maintenance and Service Program ensures systems operate to spec through scheduled service visits, module rotation, and oversight. The program reduces demand on plant personnel while supporting steady, high-yield performance.

- **Reliable Output** – Stable, repeatable system performance
- **Longer Asset Life** – Maintenance that protects key components
- **Budget Control** – Locked-in service pricing for cost clarity
- **Hands-Off Upkeep** – SmartFlow engineers manage inspections and service
- **Responsible Recovery** – Spent modules recycled or handled sustainably

REACH OUT TO US!

To Place an Order or Receive Additional Information:
Please contact our global headquarters

SmartFlow Technologies , Inc.
3308 Lee Ave
Sanford, NC 27332

Phone: 919-387-8460
E-mail: info@smartflow-tech.com
Website: www.smartflow-tech.com

VISIT OUR WEBSITE

Algae Concentration

Corn Ethanol Thin Stillage

Grape Lees Concentrate

Copyright © 2025 SmartFlow Technologies, Inc. All Rights Reserved