FILPURE OUTSIDE IN SERIES UF CLEANING PROCEDURE

FILPURE®

Filpure ultrafiltration (UF) systems require structured maintenance protocols to reverse fouling and preserve system performance. Operation depends on two main approaches: Chemically Enhanced Backwash (CEB) for routine optimization and Clean-in-Place (CIP) for intensive, offline permeability recovery.

1. Cleaning Types and Triggers

- **Chemically Enhanced Backwash (CEB):** Executed several times per week using a integrated dosing pump system. Cleans at a low flux rate and finishes with a high-flux hydraulic rinse.
- **Clean-in-Place (CIP):** Performed offline when operational membrane permeability drops below targeted parameters (typically 100–150 L/m²/h/bar) or when routine CEB steps no longer restore performance.
- **Operations Support:** Cleaning cycle patterns can be modeled and monitored utilizing the Filpure Ultrafiltration Operations Advisor software configuration.

2. Chemical Optimization & Limits

- **Acids (Mineral/Organic):** Employed to dissolve inorganic scaling and mineral precipitation. Standard implementations include hydrochloric acid (HCl) or sulfuric acid (H2SO4), carefully target-adjusted to a pH range of 1.0 to 2.5.
- **Alkalis (Caustic):** Utilized to break down organic fouling matrices, biological biofilms, and oils. Sodium hydroxide (NaOH) is standard, target-adjusted to a pH range of 12.0 to 13.0.
- **Oxidants:** Sodium hypochlorite (NaOCl) is applied during specific backwash or CEB steps for structural disinfection and biological controls. Continuous high-dosage chlorination is restricted based on specific fiber configurations.

3. Standard CIP Workflow Sequence

Step 1: Solution Preparation — Prepare the target chemical concentration in the dedicated CIP tank, maintaining required safe thermal ranges (typically restricted to a maximum of 40°C–45°C depending on module series specifications).

Step 2: Recirculation — Circulate the active chemical wash stream directly through the Filpure UF modules under managed low-pressure crossflow velocities (roughly 25–50 L/m²/h).

Step 3: Soaking Cycle — Allow the fibers to completely soak in the trapped chemical matrix to dislodge stubborn foulants, up to a maximum recommended total CIP duration of 12 hours.

Step 4: Rinsing & Flushing — Completely drain the modules from both top and bottom ports. Flush the entire circuit thoroughly using high-quality UF filtrate or pretreated water until neutral pH is verified.

Step 5: Membrane Integrity Testing — Execute a standard pressure-hold or bubble test across the array to confirm fiber structural integrity before restoring full service routing.