Tech Fact

DuPont™ IntegraTec™ PES-UF Module Preservation

Powered by inge heart of pure water a DuPont brand

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1 Original Preservation (new PES-UF Modules)

The Multibore™ membranes contain preservative in order to prevent the membranes from drying out, to protect the membranes from freezing temperatures during transport and storage and to inhibit microbiological growth in the membranes. Drying of the pores in the membranes would result in permanent permeability loss due to pore collapse, while freezing of the fluids in the pores could potentially damage the membranes. Microbiological growth wouldn't damage the membranes, but it would necessitate extensive oxidative cleaning.

DuPont™'s standard preservative solution consists of a mixture of glycerin (1,2,3-propanetriol) and propylenglycol (1,2-propanediol). As both glycerin as well as propylenglycol are non-hazardous substances (approved as food additives), and are completely miscible with water, it is relatively easy to rinse these substances out of the modules.

2 Preserving UF modules for downtimes > 7 days

Previously operated UF Membranes/module(s) must be properly preserved in the event of a system shutdown lasting longer than 7 days. Before taking steps to preserve the membranes/module(s), it is absolutely essential to perform chemical cleaning to remove any organic or inorganic contaminants (fouling, scaling) from the membranes.

3 Preparation of Preservation Fluid

The solution should ideally be prepared using reverse osmosis permeate or demineralized water. Alternatively, any water of at least UF filtrate quality can be used. Re-preservation of the modules/rack is achieved by total immersion of modules using a solution of 1 % sodium metabisulfite (10,000 ppm, SMBS) in water. The solution should be injected into the module from the feed side in order to avoid contaminating the filtrate side.

4 Assembled PES-UF Module Installation

The preservation batch solution is prepared in the CIP or other supplementary tank. UF rack must be drained prior to re-preservation if previously operated. Prepare a minimum of 100 liter per UF module plus inner volumes of the CIP supply pipes and CIP tank minimum volume for pump cut-off.

4.1 Step 1

Solution to be recycled through the UF rack in CIP feed recirculation mode for 30 minutes

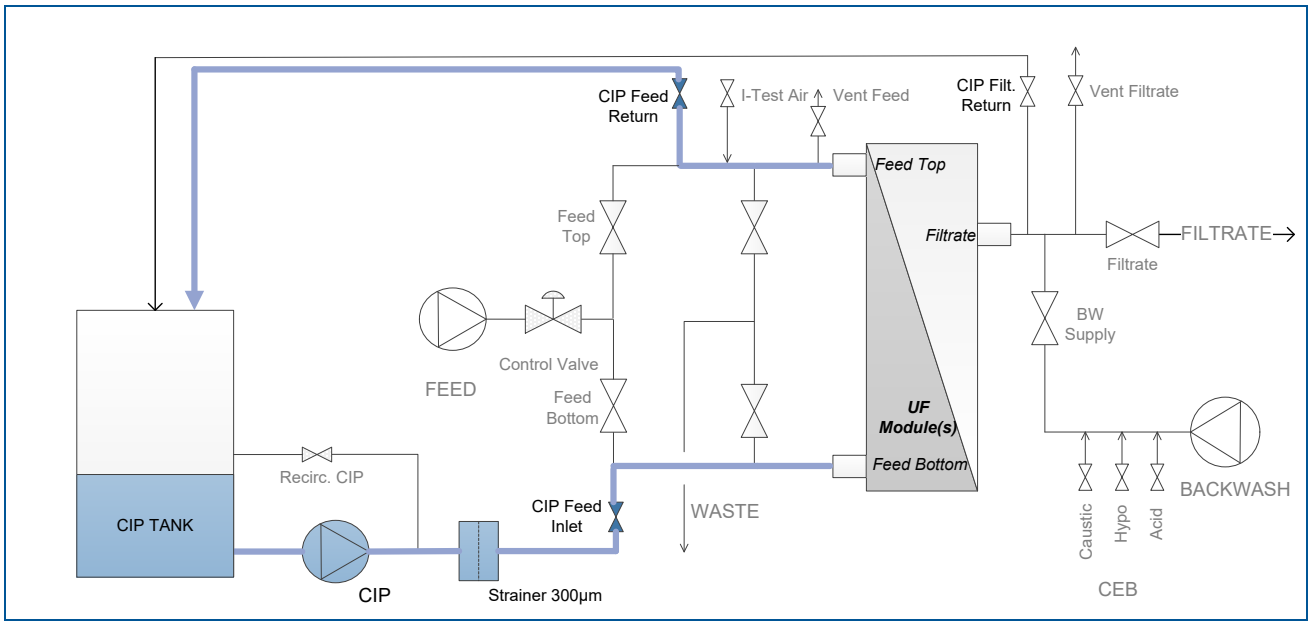

Figure 1: UF CIP arrangement for feed-feed recirculation of preservation solution

4.2 Step 2

- Solution to be recycled in CIP feed + filtrate recirculation mode for further 30 minutes.

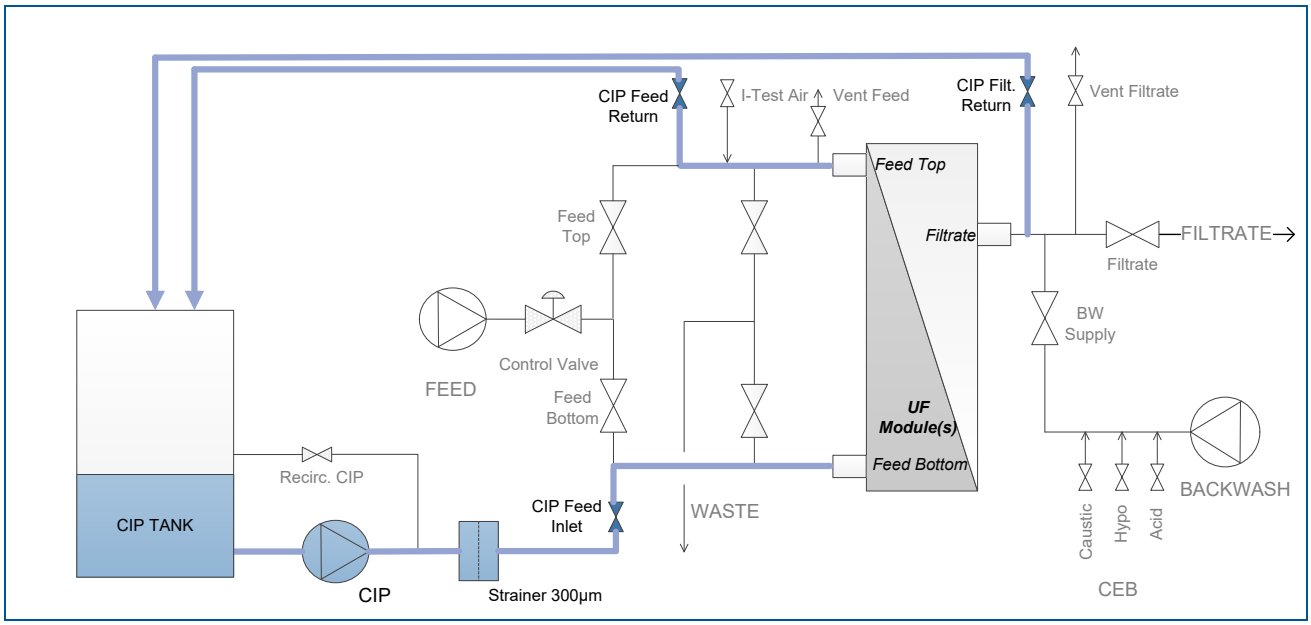

Figure 2: UF CIP arrangement for feed-feed+filtrate recirculation of preservation solution

4.3 Step 3

The DuPont™ IntegraTec™ T-Rack™ remains in filled condition at the end of the preservation with all valves closed.

NOTE	
	After re-preservation the modules can be stored for the following durations until the preservation has to be refreshed again: New UF installation: Check weekly for pH of SMBS solution inside the T-Rack™. Renew when solution pH drops below pH3.0. Maximum time until renewal of preservation is 4 months. Previously operated UF installation: Check weekly for pH of SMBS solution inside the T-Rack™. Renew when solution pH drops below pH3.0. Maximum time until renewal of preservation is 2 months.

5 Un-installed individual PES-UF Modules

Prepare 60-70 liter preservation batch solution in supplementary tank before starting this procedure. Prepare floor containment (clean) from where solution can be collected and reused for subsequent PES-UF Modules. Add 0.1g/l SMBS to preservation solution after each UF module preserved to account for reduced strength.

5.1 Step 1

- Lay down the module, tighten it in a safe position e.g. placed on top of wooden pallet, to avoid any movement during the preservation procedure.
- Remove all original installed yellow and red caps (feed bottom, feed top, filtrate connector)

5.2 Step 2

- Install 6" blind caps on bottom side of the feed connectors (UF module T-Rack™ type).
- Turn the module, filtrate connector on top.
- Install 2" pipe to prolong connector height (filling level).

5.3 Step 3

- Fill the preservation fluid into the module via one side of the feed connectors, until excess fluid is overflowing through the filtrate port.

⚠ CAUTION	
⚠	**DANGER OF DAMAGE!** Preservation fluid needs to be filled from the feed side, in order to avoid contamination of the filtrate side!.

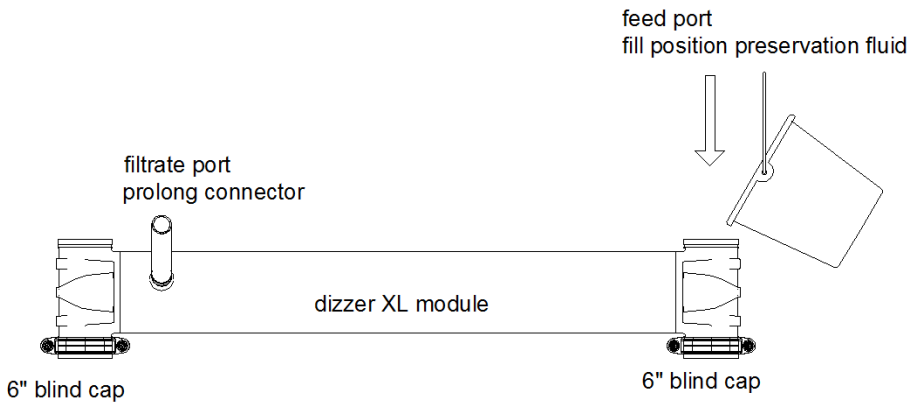

Figure 3: Exemplary re-preservation for UF module T-Rack™ type

5.4 Step 4

- Allow 30 – 60 minutes for preservation fluid to fully soak into the membrane pores, before draining it from the module again.

5.5 Step 5

- Drain the preservation fluid by setting the module upright to vertical position for 30 minutes. Drain into floor containment (clean). UF modules Secure against tipping by e.g. leaning the module against the wall.

5.6 Step 6

- Before storage, reinstall all the all 5 original yellow and red caps, matching the original delivery state. Temperatures must be kept below 40°C during storage conditions.

NOTE	
	After re-preservation the modules can be stored for the following durations until the preservation has to be refreshed again: • New UF module: Renew preservation after 6 months. • Previously operated UF module: Renew preservation after 6 months.

6 General Precautions

- Trained personnel should observe applicable EHS regulations while following these standard operating procedures.
- Pay attention to applicable EHS regulations - respiratory protection, gloves and protective clothing - when handling chemicals (sodium bisulfite).
- During all work done assure a clean environment is given to avoid any mechanical damages and any contamination of the UF modules.
- Make sure the module is tightened in a safe position to avoid any movement during the preservation procedure, e.g. tied securely on a wooden pallet.
- Clean the floor after the replacement process, as the preservation fluid contains Glycerin, which poses slip hazard.
- Observe rules and regulations regarding long-term exposure to wet working environments (i.e. skin protection).

7 Documentation

Re-preservation steps must be fully documented indicating dates, DuPont™ module serial numbers, detailed procedure and storage conditions in order to maintain DuPont™ IntegraTec™ PES-UF Module warranty.

DuPont™ reserves the right to request customer documentation on preservation and storage conditions at any time during the module warranty period.

Have a question? Contact us at:

www.dupont.com/water/contact-us