

TECHNICAL BRIEF

Cleaning BevASSURE® PES Membrane Filters with Caustic Solutions

Introduction:

In malt or fruit based beverage applications where pre-filtration is used prior to the final membrane filters, the final membrane filters tend to plug by gradual constriction of the pores with deformable colloidal substances, not by the collection of particulate or microorganisms on the membrane surface. The colloidal substances are composed of various naturally occurring organic materials that include beta-glucans, proteins and tannins. These components are inherent in the malt or fruit, or are generated in upstream processes such as fermentation and the enzymatic breakdown of carbohydrates and other compounds.

Regular flushing of the filter with warm 131°F (55°C) water can reduce this build up, remove the layer of these materials on the membrane surface, flush them from the filter matrix and increase the filter's service life (refer to CUNO Technical Brief, # LITTD02). However, flushing with a dilute caustic solution will further reduce colloidal build-up.

This procedure has been found to work best with beer or malt based beverages. As an example, in the filtration of beer, laboratory studies show a 25% minimum filter service life increase when using a warm water flush in conjunction with a mild alkaline flush as opposed to the warm water flush alone. For best results, it is essential to clean the filters before the process flow differential pressure exceeds 10 psid (689 mbar). The recommended alkaline solution is 2-3% NaOH at a maximum of 140°F (60°C). **Always use filtered water to make the solution.**

Procedure:

Warning: Exercise caution when working with caustic solutions. Appropriate personal protective equipment: clothing, gloves, and face/eye protection (safety glasses, goggles, or full face shield) must be worn at all times.

1. At the end of a standard filtration cycle, flush the filter with warm 131°F (55°C) filtered water as described in CUNO Technical Brief, LITTD02. Flush until filtrate appears clear.
2. Drain the housing and close the inlet and outlet housing valves.
3. Open the upstream housing bleed valve.
4. Open the inlet valve, slowly add the caustic solution and fill the housing.
5. As the caustic solution emerges, close the upstream housing bleed valve and slowly open the downstream housing valve.
6. Flush the caustic solution through the system for 15 minutes at a flow rate at least as fast as the beverage itself (typically 1-2 gpm [4-8 lpm] per 10" filter cartridge). Faster flows will access more pores but do not exceed 50 psid (3.44 bar) per 10" filter cartridge.
7. Stop the flow of caustic solution and flush the housing with filtered ambient temperature ½% to 1% citric acid solution to neutralize any residual alkaline solution in the housing.
8. Stop the flow of citric acid solution and flush the housing with filtered ambient temperature water to remove the residual citric acid solution.
9. Integrity test the filter(s) before the next use.



CUNO Filter Systems Designed for Beverage Filtration



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