TECHNICAL BRIEF

Sanitizing BevASSURE® PES Membrane Filters with Hydrogen Peroxide/Peracetic Acid Based Sanitizing Solutions

Introduction

The recommended conditions for chemical sanitation of used membranes are: 1) a warm water flush using filtered water at 131°F (55°C) followed by 2) a static soak of the cartridges for 30 minutes in 0.5% v/v aqueous hydrogen peroxide/peracetic acid based sanitizing agent solution at ambient temperature. Laboratory tests indicate that the CUNO BevASSURE PES membrane is compatible with dilute solutions (up to 1.0% v/v) of hydrogen peroxide/peracetic acid based sanitation agents for up to 150 continuous hours at room temperature. Measurement of the forward flow diffusion during the tests indicated the forward flow integrity test (FFIT) values remained constant as a function of time of exposure to the sanitizing agent and remained well below the FFIT specification. No deterioration in the membrane flow characteristics as a function of the time of exposure were found.

Chemical sanitation is only effective when the hydrogen peroxide and peracetic acid can penetrate the pores. Therefore, a warm water flush is employed prior to use of the chemical sanitation agents to remove excess colloidal material from the membrane surface to expose the pores in the membrane. Warm water can only work on those pores the warm water can flow through. Once a pore is plugged, neither the chemical sanitation agent nor warm water will be completely effective in removing the colloidal materials. Therefore, warm water flushing and chemical sanitation should be practiced **BEFORE** the differential pressure across the membrane begins to build. Once the differential pressure rises, the pores are effectively lost and can be considered as permanently plugged.

The warm water flushing or regeneration of the membrane, followed by chemical sanitation is ideal for removing water soluble materials and oxidation by-products. These sanitation steps are usually followed by a hot water sanitation step. The typical temperature during the sanitation is 80° to 90°C. At these elevated temperatures, the colloidal materials tend to “bake” in the pores and on the membrane surface causing permanent plugging of the membrane. Therefore, maximum benefit is achieved by conducting the warm flush and chemical sanitation **PRIOR** to the hot water sanitation step.

Procedure

Warning: Exercise caution when working with oxidizing agent solutions. Wear and use appropriate personal protection equipment: clothing, gloves, face/eye protection (safety glasses, goggles, or full face shield) at all times.

1. At the end of the daily filtration run, push residual product out of the housing and cartridges with ambient temperature filtered water, air or CO_2.
2. Flow 131°F (55°C) filtered water through the filters to drain for 15 minutes at the same flow rate used to filter the product.
3. If filters are in series, it is recommended that the first filter be flushed to drain with warm water for 15 minutes before diverting the flow through the second filter.
4. Allow the housing to return to ambient temperature. (Flowing cold, filtered water through the filters will shorten the time required to cool the housing and filters.)
5. Slowly add the 0.5% v/v hydrogen peroxide/peracetic acid sanitizing solution and fill the housing.

6. Allow the hydrogen peroxide/peracetic acid solution to remain in contact with the filters for 30 minutes.
7. Flush the sanitizing solution from the housing by flowing ambient temperature filtered water to drain for 15 minutes at a flow rate of up to 3 gpm per 10” element not to exceed 35 psid.
8. If desired, flow 176°F (80°C) filtered water through the filters to drain for 30 minutes at the same flow rate as used to filter the product.
9. Allow the housing to cool to ambient temperature. (Flowing cold, filtered water through the filters will shorten the time required to cool the housing and filters.)
10. Integrity test the filters before the next production run.

The five most common sanitizing agents (the manufacturer) used in this application are:

Sanitizing Agents	**Active Components**		
Oxygal NEP (CFPI)	15% hydrogen peroxide	2.5% peracetic acid	
Oxonia (Henkel)	4% hydrogen peroxide	32.5% peracetic acid	
Divosan Mezzo (Diversey)	22% hydrogen peroxide	2.5% peracetic acid	8% nitric acid
Divosan Plus (Diversey)	15% hydrogen peroxide	5% peracetic acid	
Divosan Forte (Diversey)	26% hydrogen peroxide	15% peracetic acid	

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