



FILMTEC Membranes

FT30 Reverse Osmosis Membrane Biological Protection and Disinfection

Following are recommendations for the biological protection and disinfection of spiral wound elements containing FT30 membrane. In using any chemicals indicated in subsequent sections, follow accepted safety practices. Consult the chemical manufacturer for detailed information with questions about safety, handling and disposal.

Membrane Preservatives.

To prevent biological growth during storage, shipping, or system shutdowns, it is recommended that FILMTEC® RO elements be immersed in a protective solution. The standard storage solution contains 1.0 percent (by weight) sodium metabisulfite (food grade). This storage solution will not adversely affect membrane flux or performance.

Chlorinated Disinfectants.

FILMTEC FT30 membrane can withstand short-term exposure to free chlorine (hypochlorite); however, its resistance is limited. The membrane can be used successfully in installations where system upsets result in temporary exposure to free chlorine. Eventual degradation may occur after approximately 200-1000 hours of exposure 1 ppm concentrations of free chlorine. The rate of chlorine attack depends on various feedwater characteristics. Under alkaline pH conditions, chlorine attack is faster than at neutral or acidic pH. Chlorine attack is also faster at higher concentrations of heavy metals (e.g., iron) which catalyze membrane degradation. Disinfection with agents containing combined chlorine is generally not recommended. This includes such compounds as chloramine, chloramine-T, and

N-chloroisocyanurate. FT30 is resistant to mild chlorinating agents such as these at low concentrations. However, their effectiveness as disinfectants at low concentrations is limited. These compounds can also slowly damage the membrane, because they are in equilibrium with small amounts of free chlorine.

Pure chlorine dioxide can be used successfully at 500 ppm concentration if the storage period is less than one week, but it is not an effective biocide for longer periods. Chlorine dioxide that is generated on site from chlorine and sodium chlorate is always contaminated with free chlorine, which attacks the membrane. The FT30 membrane is permeable to chloramine and to chlorine dioxide. Either of these will pass through the membrane, resulting in a small residual disinfectant in the permeate. ✓

Other Disinfectants.

Hydrogen peroxide or hydrogen peroxide/peracetic acid solutions can be used at concentrations up to 0.2 percent. The temperature must not exceed 25°C (77°F), or damage to the membrane may occur. Also, heavy metals such as iron must not be present, because they catalyze membrane degradation in the presence of hydrogen peroxide solutions. Continuous exposure at this concentration may eventually damage the membrane. Instead, periodic use is recommended.

Formaldehyde can be used as a disinfectant. However, this reagent should not be used unless the element has been operated for at least six hours, or a severe flux loss may occur. After this initial operating period, 0.5 to 3.0 percent concentrations may be used.

A one-time permanent flux loss of 5 to 10 percent is likely to occur after the first use of formaldehyde. Subsequent applications will result in a temporary flux loss, which will last for 2-4 hours after flushing out the formaldehyde.

Copper sulfate can be used to control the growth of algae. Typically, copper sulfate is fed continuously at 0.1 to 0.5 ppm concentrations. The pH must be low enough to prevent the precipitation of copper hydroxide.

Iodine, quaternary germicides, and phenolic compounds cause flux losses and are not recommended for use as disinfectants.

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