

PRETREATMENT OPTION TO ENSURE LONGER RO MEMBRANE LIFE

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Much like death and taxes, reverse osmosis membrane fouling is inevitable. However, there are preventative measures that can be taken to minimize scaling and fouling that will ensure longer reverse osmosis membrane life.

REVERSE OSMOSIS

Reverse osmosis (RO) involves forcing water through a semi-permeable membrane under high pressure, leaving the dissolved salts and other solutes behind on the surface of the membrane. RO offers advantages such as significant reduction in total dissolved solids (TDS) without regeneration chemicals, significant reduction in organics (TOC), and RO is a continuous purification process.

Along with advantages, RO also has its share of disadvantages such as:

- Requires excellent pretreatment (filtration, softening, chemical feed) to maintain performance and membrane life
- Permeate requires additional polishing equipment to meet most requirements
- Permeate quality varies due to feed temperature, cycling, membrane age/condition
- Requires more feed water and produces greater waste volume than ion exchange
- Requires periodic membrane cleaning to prevent scaling and fouling

RO SCALING

Scaling of the membrane surface occurs due to the precipitation of sparingly soluble salts. As water passes through the membrane, dissolved minerals from the feed-water become more concentrated in the reject. If concentrations exceed solubility limits, crystals will precipitate on the surface of membrane. Scaling occurs first in the last elements of the system because feed-water is more concentrated and there may be more polarization.

RO FOULING

Fouling occurs because material in the feed water that cannot pass through the membrane is forced onto the membrane surface. Once material is on the membrane surface, fouling increases with increased flux rates and decreased feed flow. In addition, fouling tends to occur at the feed end where flux is the highest.

RO PRETREATMENT TO ENSURE LONGER MEMBRANE LIFE

Pretreatment is essential to the operation of all water treatment equipment. Media filtration is the lowest cost pretreatment option, and to address the scaling and fouling issues associated with RO membranes, Eco-Tec water treatment systems incorporate a unique micro media filter. The Spectrum Micro Media Filter™ provides water quality that meets or exceeds the requirements of RO membrane manufacturers. It outperforms conventional filtration and has proven to extend RO membrane life up to 5 years or more when used as a pre-filtration system ahead of the RO process.

