Membranes for Water Purification

The following guidelines are intended to provide information on initializing operation with Membrania reverse osmosis (RO) elements for water purification. For questions regarding deviations from these guidelines, please contact DC Solutions Technical Service.

SAFETY EQUIPMENT

Having proper equipment is essential for safely executing the following start-up procedure. Appropriate gloves, shoes and safety glasses should be worn at all times. Additional equipment may be necessary depending on specific system design.

START-UP FLUSHING PROCEDURE

After the elements have been removed from their packaging and installed into their pressure vessels (please refer to **Element Loading Guide – Loading of Pressure Vessels** (TSG-O-006) for loading instructions), it is important to flush out any residual storage solution before start-up. This flush also ensures that any other contaminants existing in the system are removed. The system flush should be performed with high-quality water (see Table 1).

Solute	Recommended Limit
Iron (Fe)	< 0.05 mg/L
Manganese (Mn)	< 0.02 mg/L
Aluminum (Al)	< 0.05 mg/L
Silica (SiO_2)	< 5.0 mg/L
Total Hardness as $CaCO_3$	< 50 mg/L as $CaCO_3$
Total Alkalinity as $CaCO_3$	< 50 mg/L as $CaCO_3$
Chlorine	0 mg/L
Turbidity	< 0.5 NTU
Silt	< 1 SDI

* Chlorine must be undetectable for RO & NF membranes and may be ≥ 2 mg/L for UF & MF membranes.

The recommended flow rates for flushing vary based on the diameter of the elements (see Table 2). Generally, flushing for 30 minutes is sufficient to prepare elements for operation. All fluid produced during the system flush should be discarded to a drain.

Membrane Diameter	Flow Rate per Vessel	Recommended Pressure
2.5"	0.5 – 0.9 m^3/hr (2 – 4 GPM)	1.5 – 4.0 bar (20 – 60 psi)
4.0"	1.8 – 2.3 m^3/hr (8 – 10 GPM)	1.5 – 4.0 bar (20 – 60 psi)
8.0"	7.0 – 9.1 m^3/hr (30 – 40 GPM)	1.5 – 4.0 bar (20 – 60 psi)
8.3"	7.9 – 10.2 m^3/hr (35 – 45 GPM)	1.5 – 4.0 bar (20 – 60 psi)

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