KOCH MEMBRANE SYSTEMS

PRE-STARTUP CLEANING PROCEDURE FOR RO & NF SPIRAL ELEMENTS

The following cleaning procedure must be performed prior to initial use of elements and whenever system has been inoperative for more than four (4) hours. This procedure will remove storage solution and condition membranes for production. Failure to follow this recommendation may lead to poor performance and will void element warranty. Please refer to the KMS Water Quality Guidelines on the reverse side of this document.

Step 1. Flush Cycle — Neutral pH — 122°F (50°C) — 10 min.

Flush system with clean, soft water (122°F/50°C) using minimum three times system hold-up volume, sending concentrate and permeate to drain.

Step 2. Alkaline Cycle — pH 10.0-10.5 — 122°F (50°C) — 20 min.

Fill system with clean, soft water (122°F/50°C). Add to circulating water:

KOCHKLEEN® 222 Cleaner (or KOCHKLEEN WA Cleaner in Europe) to adjust pH to 10.0-10.5

Circulate CIP solution at standard pressure and flow conditions for 20 minutes.

Step 3. Flush Cycle — Neutral pH — 122°F (50°C) — 10 min.

Flush system with clean, soft water (122°F/50°C) using minimum three times system hold-up volume, sending concentrate and permeate to drain.

Step 4. Acid Cycle *(NF Only)* — pH 3.5-4.0 — 122°F (50°C) — 20 min.

Fill system with clean, soft water (122°F/50°C). Add to circulating water:

KOCHKLEEN 100 Cleaner to adjust pH to 3.5-4.0

Circulate CIP solution at standard pressure and flow conditions for 20 minutes.

Step 5. Flush Cycle *(NF Only)* — Neutral pH — 122°F (50°C) — 10 min.

Flush system with clean, soft water (122°F/50°C) using minimum three times system hold-up volume, sending concentrate and permeate to drain.

Step 6. Water Flux — Neutral pH — 122°F (50°C) — 10 min.

Record water flux value of new membranes using procedure outlined in your operating manual. This value will serve as a baseline measurement for subsequent cleanings.

For technical assistance, please contact Technical Service at (978) 694-7050.
To place an order, please call our Customer Service Department at (978) 694-7005.

Note: If KOCHKLEEN cleaners are not readily available for the initial cleaning/conditioning, please contact the numbers above for assistance.

KMS WATER QUALITY GUIDELINES FOR CLEANING & DIAFILTRATION

For All Polymeric Membrane and Ion Exchange/Adsorbent Resin Applications

Parameter	MF/UF	NF/RO & IE/Abs. Resin
Turbidity	**< 1.0 NTU**	**< 1.0 NTU**
Suspended Solids (see Note 1)	**< 5 mg/l**	**< 1 mg/l**
Calcium (Ca)	**< 10 mg/l**	**< 5 mg/l**
Total Hardness (as $CaCO_3$)	**< 60 mg/l**	**< 30 mg/l**
Iron (Fe)	**< 0.05 mg/l**	**< 0.05 mg/l**
Zinc (Zn)	**< 0.3 mg/l**	**< 0.05 mg/l**
Copper (Cu)	**< 0.1 mg/l**	**< 0.05 mg/l**
Manganese (Mn)	**< 0.05 mg/l**	**< 0.02 mg/l**
Aluminum (Al)	**< 0.05 mg/l**	**< 0.05 mg/l**
Silica, Reactive (as SiO_2)	**< 10 mg/l**	**< 10 mg/l**
Silica, Colloidal (as SiO_2)	**< 1 mg/l**	**< 0.1 mg/l**
Silicone	**0 mg/l**	**0 mg/l**
Total Bacteria Count (TBC)	**< 1000 per ml**	**< 1000 per ml**
E-Coli Count	**0 per 100 ml**	**0 per 100 ml**
Chlorine (as NaOCl)	**< 1 mg/l**	**0 mg/l**
D-Limonene (citrus applications only)	**< 5 mg/l**	**0 mg/l**
Fats, Oils and Grease	**0 mg/l**	**0 mg/l**
Total Organic Carbon (TOC)	**< 1 mg/l**	**< 1 mg/l**
pH (standard units)	**6.5 – 7.5**	**6.5 – 7.5**

1. The water supply must be free from particulate matter such as rust, scale, flakes, sandy and granular material, slurries, scum, algae and any chemical constituents that could foul or damage the membranes.
2. The water pH may need to be adjusted with acid or alkali depending on application and local conditions.
3. KMS membranes are available in many configurations and materials that may be affected differently by various water constituents. Softened water or evaporator condensate is generally acceptable for cleaning and flushing of polymeric membranes. Please consult with the KMS Process Group for the particular membrane in question.

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KPN 1003989-R6