



PRE-STARTUP CLEANING PROCEDURE FOR UF AND MF 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) 15 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 15 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. Alkaline/Chlorine Cycle pH 10.0-10.5 122°F (50°C) 15 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
KOCHKLEEN 410 Cleaner to maintain 180-200 ppm total chlorine
Circulate CIP solution at standard pressure and flow conditions for 15 minutes.

Step 5. 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 6. Water Flux Neutral pH 77°F (25°C) 10 min.

Record water flux value. If new membrane does not achieve minimum water flux specified for that product when corrected to 50 psi and 77°F (25°C), repeat Steps 1 & 2 with 0.2% (v/v) **KOCHKLEEN KLD III Cleaner** added to Alkaline Cycle.

*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 CaCO₃)	< 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 SiO₂)	< 10 mg/l	< 10 mg/l
Silica, Colloidal (as SiO₂)	< 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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