

MEMBRANE CLEANING PROCEDURE

Do you know the Membrane Failure Causes ??????

Description	Percentage
Bacteria/Biofilm/Slime	40 %
Aluminium Silicate	30 %
Iron/Manganese	15 %
Other	10 %
Scale	5 %



IMPORTANT NOTE:

Always adhere to the guidelines prescribed by the respective membrane manufacturer.

PROCEDURE TO CLEAN THE MEMBRANE

CIP SOLUTION VOLUME:

35 -40 liters per 8" membrane element (remember to take into account if stages can be separated) prepared with permeate water.

Total CIP solution volume = # of 8" elements * 40 liters

RECOMMENDED CLEANING PROCEDURE:

SEQUENCE	PRODUCT	ADDITION	pH	TEMPERATURE
Stage 1	Genesol 40	2-3%	As high as permitted (pH 12.0)	35-40°C
Flush with clean permeate to achieve natural pH values				
Stage 2	Genesol 38	3-4%	Stabilises at pH 3.7	20-25°C
Flush with clean permeate to achieve natural pH values				

Stage 1: Alkaline Procedure to remove organics
 Genesol 40 at 2-3%
 Temperature 35-40°C

- In order to prepare membranes for most efficient cleaning heat CIP tank with only permeate (no chemical) to 35-40°C and circulate around membranes for 10-15 minutes maintaining temperature, this will raise the temperature of the membranes allow for most efficient cleaning.
- Prepare CIP solution as per above with 2-3% Genesol 40, this should stabilize at approximately pH12, maintain temperature of 35-40°C
- Low-flow pumping - Pump mixed, preheated cleaning solution to the pressure vessel/s at low flow (3-4.5 m³/hr. per pressure vessel) and low pressure (2-2.5 bar to prevent permeate being produced) to displace the process water already in the membranes. Low pressure minimises re-deposition of foulants on the membrane. On low-flow pumping allow some of the CIP solution to drain via concentrate valve. This displaces permeate water and prevents dilution of the CIP solution.
- Measure pH and adjusting if necessary, maintain temperature and recycle around the system for 20-30 minutes. If the solution shows any sign of significant discolouration, discard and prepare fresh CIP solution as above to prevent possible membrane abrasion. Recirculating dirty CIP solutions will lead to poor cleaning result and possible membrane damage.

- Once the pH, temperature and colour has stabilised allow to soak for as long as possible ideally 4-6 hours. During the soak period, recirculate the CIP solution for 2-3minutes at low flow and pressure every 45-60 minutes. For difficult fouling an extended soaking period may be required – overnight for example. Contact time is critical for organic removal.
- High-flow pumping. Feed the cleaning solution at high flow rates (8-10 m³/hr. at <4.0 bar) for 30-60 minutes. The high flow rate flushes out the foulants removed from the membrane surface by the cleaning.
- Flush with good quality permeate to natural pH levels.

Stage 2: Acid Procedure to remove iron and inorganic deposits
Genesol 38 at 3-4%
Temperature 20-25°C

- In order to prepare membranes for most efficient cleaning heat CIP tank with only permeate (no chemical) to 20-25°C and circulate around membranes for 10-15 minutes maintaining temperature, this will raise the temperature of the membranes allow for most efficient cleaning.
- Prepare CIP solution as per above with 3-4% Genesol 38, this should stabilize at approximately pH 3.7, maintain temperature at 20-25°C.
- Low-flow pumping - Pump mixed, preheated cleaning solution to the pressure vessel/s at low flow (3-4.5 m³/hr. per pressure vessel) and low pressure (2-2.5 bar to prevent permeate being produced) to displace the process water already in the membranes. Low pressure minimizes re-deposition of foulants on the membrane. On low-flow pumping allow some of the CIP solution to drain via concentrate valve. This displaces permeate water and prevents dilution of the CIP solution.
- Measure pH and adjusting if necessary, maintain temperature and recycle around the system for 20-30 minutes. If the solution shows any sign of significant discolouration, discard and prepare fresh CIP solution as above to prevent possible membrane abrasion. Recirculating dirty CIP solutions will lead to poor cleaning result and possible membrane damage.
- Once the pH, temperature and colour has stabilised allow to soak for as long as possible ideally 4-6 hours. During the soak period, recirculate the CIP solution for 2-3minutes at low flow and pressure every 45-60 minutes. For difficult fouling an extended soaking period may be required – overnight for example. Contact time is critical.
- High-flow pumping. Feed the cleaning solution at high flow rates (8-10 m³/hr. at <4.0 bar) for 30-60 minutes. The high flow rate flushes out the foulants removed from the membrane surface by the cleaning.
- Flush with good quality permeate to natural pH levels.