



DOW FILMTEC™ Membranes System Operation: Initial Start-Up

Pre-Start-Up Check and Commissioning Audit

After having loaded the elements into the pressure vessels and before starting up the membrane unit, make sure that the whole pretreatment section is working in accordance with the specifications. If the pretreatment involved changing of the chemical characteristics of the raw water, then a full analysis of the water entering the membrane unit must be made. Furthermore, absence of chlorine, turbidity and SDI must be determined.

The raw water intake must be stable with respect to:

- Flow
- SDI
- Turbidity
- Temperature
- pH
- Conductivity
- Bacteria (standard plate count)

The following checks of the pretreatment system and the membrane unit are recommended for the initial start-up (results to be included in the start-up report):

Pre-Start-Up Checklist

- Corrosion resistant materials of construction are used for all equipment from the supply source to the membrane including piping, vessels, instruments and wetted parts of pumps
- All piping and equipment is compatible with designed pressure
- All piping and equipment is compatible with designed pH range (cleaning)
- All piping and equipment is protected against galvanic corrosion
- Media filters are backwashed and rinsed
- New/clean cartridge filter is installed directly upstream of the high pressure pump
- Feed line, including RO feed manifold, is purged and flushed, before pressure vessels are connected
- Chemical addition points are properly located
- Check/anti-siphon valves are properly installed in chemical addition lines
- Provisions exist for proper mixing of chemicals in the feed stream
- Dosage chemical tanks are filled with the right chemicals
- Provisions exist for preventing the RO system from operating when the dosage pumps are shut down
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- If chlorine is used, provisions exist to ensure complete chlorine removal prior to the membranes
- Planned instrumentation allows proper operation and monitoring of the pretreatment and RO system (see [Control Instruments, Section 3.13.5](#))
- Planned instrumentation is installed and operative
- Instrument calibration is verified
- Pressure relief protection is installed and correctly set

Pre-Start-Up
Check and
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Audit (cont.)

- Provisions exist for preventing the permeate pressure from exceeding the feed/concentrate pressure more than 5 psi (0.3 bar) at any time
- Interlocks, time delay relays and alarms are properly set
- Provisions exist for sampling permeate from individual modules
- Provisions exist for sampling raw water, feed, permeate and concentrate streams from each stage and the total plant permeate stream
- Pressure vessels are properly piped both for operation and cleaning mode
- Pressure vessels are secured to the rack or frame per manufacturer's instructions
- Precautions as given in [Loading of Pressure Vessels \(Section 4.1 & 4.2\)](#), are taken
- Membranes are protected from temperature extremes (freezing, direct sunlight, heater exhaust, etc.)
- Pumps are ready for operation: aligned, lubricated, proper rotation
- Fittings are tight
- Cleaning system is installed and operative
- Permeate line is open
- Permeate flow is directed to drain (In double-pass systems, provisions exist to flush first pass without permeate going through the second pass)
- Reject flow control valve is in open position
- Feed flow valve is throttled and/or pump bypass valve is partly open to limit feed flow to less than 50% of operating feed flow

DOW FILMTEC™ Membranes
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Warning: Oxidizing agents such as nitric acid attack organic ion exchange resins under certain conditions. This could lead to anything from slight resin degradation to a violent exothermic reaction (explosion). Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.

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