

Low Profile Membrane Electrode Cells

Best Practices
UFS Corporation
10 April 06

Baselines

Baseline values are important from the beginning in order to troubleshoot ME Cells in the future.

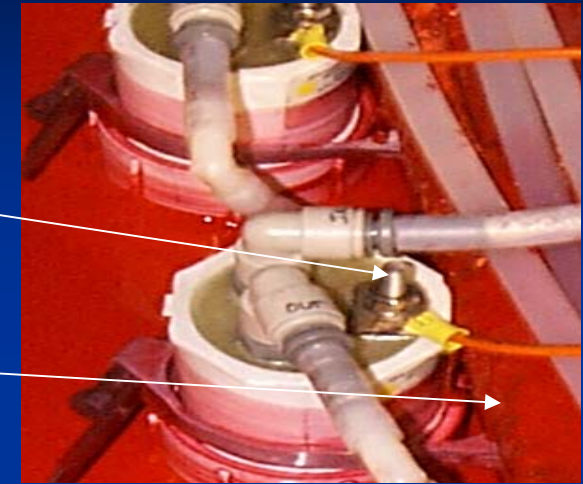
1. Total Amps (rectifier)
2. Total Volts (rectifier)
3. Total peak amps per ME Cell
4. Inlet manifold pressure (not to exceed 5-7 psi).

Installation of Low Profile Cell

- See Membrane Shell Replacement Strategy (990157) before replacing any Cells.
- If ED tank is full of paint, the Low Profile Cell must be filled with either DI or RO water before installing to avoid any potential damage to Low Profile Cell.
- Seam of Membrane Shell and Electrode must be against tank wall. Electrical stud or wire should be facing tank wall to ensure membrane and electrode seam are facing tank wall.
- Anolyte supply inlet and outlet **MUST NOT BE REVERSED. DAMAGE WILL RESULT.**
- If electrical stud is exposed, it must be covered with red plasti dip. (See Installation Reference 993144)

Electrical stud or wire

Tank Wall



Electrical stud or wire is facing tank wall.



Electrical wire and stud covered with red plasti dip.

Flow Meters

- Every cell should have an individual Flow Meter.
 - Maintenance friendly.
 - Easier to isolate leakers.
 - Do not have to shut down 2 or 3 cells in a bank (using one flow meter) if only one Membrane Electrode Cell is leaking.

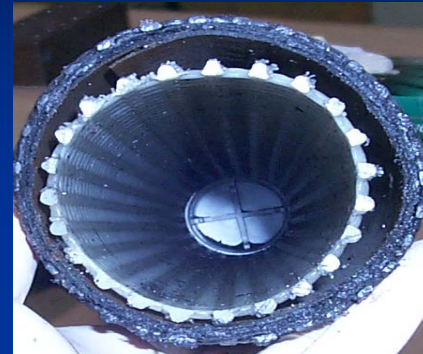
Supply and Return Tubing

- Supply tubing should be 3/8" x 9/16" (3/32 wall).
- If using 1/2" return tubing it should be 1/2" x 11/16" (3/32 wall).
- Never use wire ties to bundle tubing together.
- Never allow tubing to become kinked.
- Braided tubing is less likely to become kinked.
- Use 90 degree fittings on return manifold so tubing over time does not become kinked.

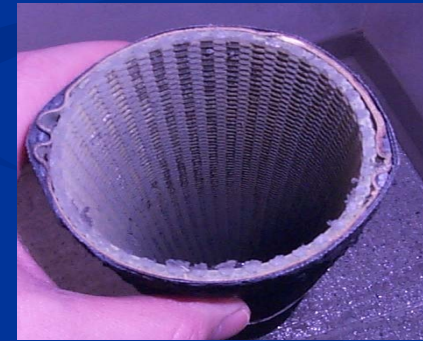


Anolyte Recirculation

- Make sure inlet manifold pressure is 5 – 7 psi. Over Pressurized closed Cell membranes are permanently damaged and will leak.
- Use a Ball Check Valve with manual bypass on discharge leg of anolyte supply piping to prevent siphoning of anolyte from Membrane Electrode Cell. Contact UFSc for details.
- Anolyte Return Manifold must be above anolyte tank for gravity return of anolyte. Use vertical pipe into anolyte tank.



Over Pressurized Shell



Normal Looking Shell

Troubleshooting

- Add temporary flow meter to return side to verify the flow coming out is the same going in. This will indicate any gross leaks.
- Refer to Service Reference (990104) to help identify leaking Cells.
- Disconnect return line and watch level.
- If leaker is found and hole or tear is 1" or less, it can be fixed with UFS repair kit 164023. If larger than 1" the shell needs to be replaced.

What to do if a leaker is found?

- Turn off flow meter to leaking Cell.
- Disconnect electrical connection to the Cell. If Cell is not disconnected electrically the Cell will heat up causing paint solids to build up on the OD of the membrane.
- If the Cell is not disconnected electrically make sure the Cell is filled with anolyte at least 2 times per shift. This will slow down the build up of paint solids on the outside of the membrane.
- Obtain troubleshooting help from UFSc.com



Paint Build-Up on OD of Membrane Shell.



Normal Looking OD of Membrane Shell.