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Service Reference

Topic: Evaluating TECTRON Membrane Electrode Cells

There are several ways to evaluate the condition of your TECTRON™ Membrane Electrode Cells:

1. Visually inspect Electrodes looking for wear. Start a mass loss-sampling program if you use stainless steel Electrodes (i.e. anodes).
2. Measuring the current draw for each Cell and create a trend chart. Also record and create a trend chart on required voltage verses week or month.
3. Measuring the surface resistance of the ion-exchange membrane.

Establish Baselines

The creation of baselines for important parameters is important in understanding changes as the equipment ages. The time spent in gathering this data during the start up and commissioning of the Membrane Electrode System will be repaid when it comes time to budget and schedule replacement parts.

Inspecting Electrodes

If you are using precious metal type anodes, then a visual check is suggested (Bulletin #990161). If using 316L stainless steel anodes an effective method to determine the remaining electrode life is to weigh several electrodes every so often and create a trend chart (Bulletin #990129). Stainless steel anodes should be replaced (within the next 6 months or so) once they have lost 60% of their original mass. Anodes are sacrificial because they are operated in an oxygen environment. Usually 10 to 20 micrograms, or even higher, of the stainless steel anode will dissolve per Coulomb. (1 Coulomb = 1 amp for 1 second). The life for cathodes is indefinite and usually do not need to be inspected.

Measuring Cell Electrical Current Draw

Measuring and recording the individual current draw of each Cell is an effective troubleshooting tool for evaluating the condition of the Membrane Electrode Cells. Data is normally collected over a number of months or years. It is most useful when the initial current draw is recorded at startup and used as a benchmark for future readings. Also record the voltage since its increase over time can signal the natural increase of resistance in the Membrane Shell as it wears. UFS can provide a quotation for a Current Monitor System if you do not have the means to measure the current.

Measuring Membrane Surface Resistance

The membrane surface resistance is measure of how much wear the Membrane Shell has been exposed and thus how much more useful life may be left. This test can be performed on site, but UFS Corporation does not recommend customers attempt to perform this test as both the voltage drop across the Cell and the current through the Cell, which have to be measured simultaneously. UFS suggests the use a destructive test in a lab setting to confirm suspicions about the high resistance of the original Membrane Shells. This test can generally be performed in two weeks or so. Contact Customer Service for more information on how to schedule this test.