



UFS Corporation

330 North 400 East
Valparaiso, IN 46383-9704 USA
PH: 219-464-2027 FAX: 219-464-8646
www.ufsc.com
email: service@ufsc.com

Service Reference

Topic: Sudden Increased Voltage Requirement

Please read all the instructions listed below carefully to familiarize yourself with the project before attempting to perform any of the work or unpacking any further.

Required Materials

- None
- Buffered DI water
- Approved solvent paint cleaner

Required Tools

- Flashlight
- Soft bristle brush with rounded bristle
- Clean rags
- Clamp on ammeter

Three main factors impact voltage through the E-Coat system, including voltage drop through the Membrane Electrode Cell, voltage drop through the paint bath, and voltage drop across the wet film.

Over time, the E-coater will gradually increase voltage settings on the rectifier to maintain the required film build. This gradual increase compensates for the gradual increase in the resistivity of the Membrane. When the voltage on the rectifier reaches a certain point, further increases in the rectifier setting will not continue to maintain the film build. At this point, either the amount of parts per rack (thru-put) will need to be decreased or the Membrane Shells will need to be replaced.

At times, conditions arise where significant increases in the rectifier's voltage setting will not correct low film builds. Low film builds are an indication of low voltage across the wet film, which is the result of an increase in the voltage drop across either the Membrane Electrode Cell or through the paint bath. The paint companies have operating parameters for their E-Coat paint products. Changes in the paint bath conductivity, temperature, percent solids, pH, P/B ratio, etc., can and/or will affect the voltage drop through the paint bath. Check with your paint representative to verify if any of these paint parameters may have changed.

The voltage drop through a Membrane Electrode Cell can be affected by the resistivity of the Membrane, by a film on either the inside or outside of the Membrane, by a film on the outside of the Electrode, or by excessive wear on the Electrode.

(continued)

In order to determine if the Membrane Electrode Cells are the cause (or a contributor) to the high voltage condition, there is a relatively simple test that can be performed on a small sample set of Cells.

1. Select the Cells that will be used for the test. This group will become the sample set. For most situations, it is only necessary to select ~10% of the Cells just on one side of the ED tank. The Cells on the other side should have the same test results due to symmetry.
2. Make sure to select Cells that are typical for the ED system and have an age about the same as the others. Do not select new Cells that may have been installed to replace damaged original Cells.
3. Use either a Current Monitoring System or a clamp-on amp meter to measure the maximum amount of current passing through an individual Cell for a particular work item. Record this amp reading, it is called the 'before' value. Also record the type of ware that was in the ED tank while the measurements were taken.
4. Remove the Membrane Electrode Cell. Disassemble the Membrane Electrode Cell by removing the Electrode from the Membrane Shell.
5. With buffered DI water, clean the outside and inside of the Membrane, and the outside of the Electrode. You can also use a solvent-based cleaner (approved by your ED paint supplier) and a soft bristle brush. If the Model Number of your ME Cell begins with a "T" or "S", then you can remove the Membrane Guard and attempt to clean any foulant off the outside sure of the Outer Wrap, which is covering the ion-exchange membrane.
6. Reassemble the Membrane Electrode Cell by installing the Electrode into the Membrane Shell. Replace the Membrane Guard if applicable and then reinstall the Membrane Electrode Cell into the ED tank.
7. Repeat Step 3 and record the reading. This will be the 'after value'. Make sure to take the measurement only with the same ware as in Step 3. If the ware is different, then it is almost impossible to make any sort of comparison between the 'before' and 'after' readings.
8. If the difference between the 'After' & 'Before' readings is more than 10%, then it is likely that some sort of foulant was removed from the ME Cell during its cleaning.
9. Repeat for Step 7 the next day and then the following day. If the current levels remain higher than 'before', then the chances are great that the foulant has been removed and no longer is acting in a fashion to increase resistance to the flow of electric current to the ware.
10. If the difference in Step 8 is less than 10%, or else the improvement is lost in Step 9, then cleaning the ME Cells will not likely result in a lower voltage. (see Step 11). Contact the UFS Customer Service Department about the possibility of setting up further testing.
11. It may be possible to remove the Outer Wrap from the ME Cell to extend the life and also more fully remove any foulant that may be causing an increase in the electrical resistance of the ME Cell. See Bulletin #990174 for more information.

For more information see the original manual that came with the equipment or call UFS at the phone number shown above.