

Service Reference

Topic: Membrane Shell Replacement Strategy

Please read carefully before performing work or unpacking any further

Required Materials

- In service date of all Cells in the ED tank.

Required Tools

- None

Eventually the Surface Resistance of the ion-exchange membrane will increase to a point where replacement is justified because of the extra voltage required or the occurrence of too many ED film defects related to high voltage. Careful planning in the placement of the new Membrane Shells will ensure that you get the fullest life possible from the replacement Membrane Shells. The Shells at the entry of the ED tank (monorail conveyor), in the front part of each electrical zone (automotive ED tank), or in the middle of the ED tank (hoist or indexing conveyor) will suffer the greatest wear and need to be replaced first. The Membrane Shells in the other places of the ED tank probably have some more life left in them and can be replaced second.

A good strategy to follow is to remove the Membrane Shells that are in the high current areas and move the other Membrane Shells from their low current positions to the places vacated by the higher current Shells. The Replacement Shells can then be back filled into the low current positions.

Two of the more common replacement philosophies are the One Third strategy and the Half strategy. Electrodes are generally replaced when they have lost 60% of their original mass. For the purposes of this document, it will be assumed that all the Electrodes will be reused and none are replaced.

One Third

This replacement schedule is applicable for monorail systems only. It will allow the Membrane Shells to be replaced over the course of a year. Divide the ED tank into thirds as shown in Figure 1. **NOTE:** If your ED system has different voltage zones, then your thirds will be spread out.

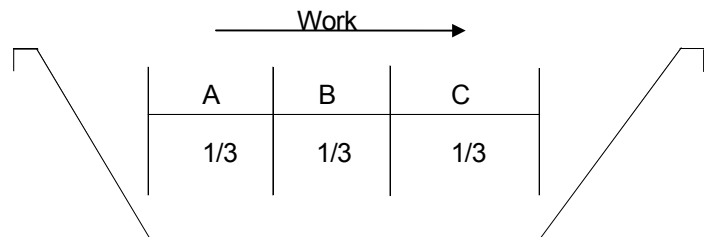


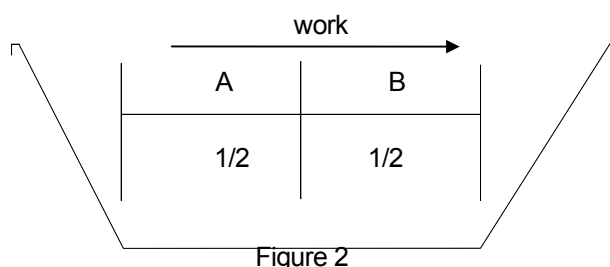
Figure 1

1. **First Third** - Pull all the Electrodes from the Shells in region A and set them aside. Remove all the Shells from region A and discard.
2. Pull all the Electrodes from the Shells in region B and set them aside. Move the Shells from region B to region A and replace the Electrodes into the moved Shells.

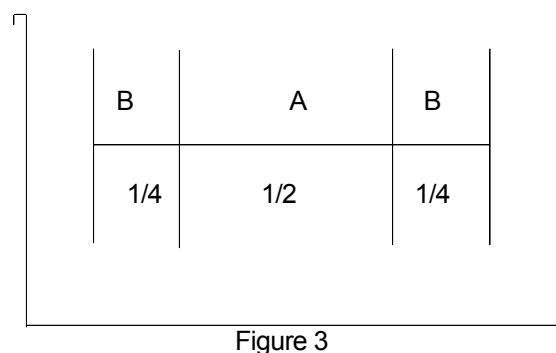
3. Pull all the Electrodes from the Shells in region C and set them aside. Move the Shells from region C to region B and replace the Electrodes into the moved Shells. Place all the new Membrane Shells into region C and replace the Electrodes into the new Shells.
4. **Second Third** - In about 6 months repeat steps 1 through 3. Keep some of the better used Shells taken from region A and save as emergency spares.
5. **Final Third** - In another 6 months repeat steps 1 through 3.

Half

This replacement schedule will work in both hoist and monorail systems. It also allows for Membrane Shells to be replaced within a year's time period. Begin by dividing the ED tank in half. See Figure 2 for monorail systems. See Figure 3 for hoist systems.



1. Pull all the Electrodes from the Shells in region A of the tank and set them aside. Remove all the Shells from this region and discard.
1. Pull all the Electrodes from region B and set them aside. Move the Shells to Region A and replace the Electrodes. Place the new Shells in region B. Replace the Electrodes into the new Shells.
1. Repeat steps 1 and 2 in six months.



HINT: Some of the Membrane Shells that are still working well when removed can be kept as emergency spares.

HINT: Annual cleaning is essential to reduce or prevent paint contamination and keep the Membrane Shells working longer at an optimal level.

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