



## UFS Corporation

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# Technical Reference

## Topic: Upgrade to TECTRON™ Membrane Electrode Cells

If you are using box or crescent-shaped anode cells, you may consider upgrading your equipment when heavy maintenance of old cells is required. This document will assist you with some important considerations and ensure your conversion project goes smoothly. Developing the budget for your project will focus on three line items: Membrane Electrode Cells & Installation Accessories; Items Supplied by Others; and Installation Labor.

The Membrane Electrode System (or anolyte system if cathodic paint is used) consists of:

- Holding Tank & Drain Piping
- Circulating pump & Associated Gauges, etc.
- Conductivity Sensor & Controller
- Local Piping from the Holding Tank/Pump to the Manifolds
- Membrane Electrode Cells (including Cell support, fluid & electrical connections)
- Electrical Bus

As a starting point, this document assumes the painted throughput will not change. If you are contemplating increasing the painted throughput, please request Bulletin #991108 *Membrane Electrode System Design Book* and ask your Sales & Service Engineer for a print-out of the Electrode Area Design & Engineering Summary for your ED System.

### Membrane Electrode System

**Holding Tank** – Generally, the volume of the existing tank is adequate and does not need to be changed. As a double check, the design sheet you will receive from your Sales & Service Engineer will have an estimate for the volume. NOTE: If your tank is at least 80% or more of the recommended volume, no change is required.

**Circulating Pump, etc.** – If your system is more than 8 years old, the pump may have to be replaced as circulation rates have increased since then. Your sheet will have a recommended flow rate.

**Conductivity Sensor & Controller** – The Sensor & Controller probably will need to be changed as conductivity levels have

increased. As a standard, UFS Corporation only stock 0-10,000 microSiemens/cm controllers. Another design change is to install the sensor in the pump discharge line to keep it cleaner.

**Local Piping** – If your pump will be upgraded, you will also need to increase the size of your discharge piping. At a minimum, the discharge piping needs to be 50 mm (2"). Large ED systems can use 75 mm (3") pipe. The maximum flow velocity should not exceed 2.15 m/sec (7 ft/sec).

**Membrane Electrode Cells** – Typically it may take up to five or six TECTRON Cells to replace a box cell or 2 to 3 TECTRON Cells for each crescent-shaped cell. For a complete technical discussion of TECTRON Cell and its typical installation,

request Bulletin #991001 *TECTRON Anode Cell*.

**Electrical Bus** – A DC rectifier is an important part of the ED system. The output of the rectifier is fed to the ED tank via a copper bus bar or individual leads. New cells are easily connected to a copper bus bar. On the other hand, if there is a cable for each old box/crescent cell, make sure to attach a copper set screw lug and use a star distribution pattern to the group of TECTRON Cells replacing it.

### **ITEMS SUPPLIED BY OTHERS**

Generally, there is at least \$1,000 to \$2,000 in replacement parts and materials required. Your Sales & Service Engineer can prepare a pro forma estimate of these materials once your project is defined. Examples of the typical type of materials include: PVC pipe and PVC fittings; 41 mm (1-5/8") square strut channel; angle iron; etc.

### **INSTALLATION LABOR**

Generally, most end-users use their own maintenance staff to install all the equipment. In some cases, due to time and project constraints, they use a local contractor. UFSc can recommend third party vendors that are experienced with ED paint finishing systems retrofits.

UFSc can estimate labor for the project so you can develop a labor budget. Hours are estimated by trade: millwright, pipe fitter, electrician, etc.

### **Drawings and Documentation**

UFSc supplies each retrofit customer with a Cell layout drawing. In addition, UFSc supplies typical General Arrangement drawings for mechanical, electrical, and piping. Your Sales & Service Engineer can assist you with choices and work with you to finalize a design. All the drawings and assistance are at no extra cost.

### **On-Site Installation**

Generally, your Sales & Service Engineer will be present at some point during the installation. The purpose of this visit is to answer questions and ensure the project is moving in the right direction. This on-site service is generally free, but in some cases, it will be quoted at \$400 per day plus customary travel, lodging, and meal expenses.

Each Sales & Service Engineer carries a pager and can be paged 24 hours a day, 7 days a week.