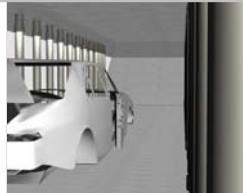


MEMBRANE ELECTRODE SYSTEMS



- **Acknowledged Leaders**
- **Reliable, Durable Products**
- **Quality Construction**

2005

Acknowledged Leaders

Experienced Staff & Quality Products

UFS Corporation's sole focus is electrocoating equipment. The same family who founded the company in 1977 operates it today, offering our customers years of experience in the electrocoat field. The care we take in consistently manufacturing high-quality products makes us the #1 choice of customers in the electrocoating industry.



Appliance: Side Cells

Our equipment is installed in more than 300 tanks in North America alone, ranging from large systems in the automotive industry to small systems for job shops. Our customers include all types of industries that e-coat including appliance, agriculture, automotive parts manufacturers, recreational equipment and general industrial products.

Our knowledgeable staff is available to assist in designing, operating and troubleshooting e-coat systems. Our commitment to providing exceptional customer service — before and after the sale — includes providing technical and engineering support, certified drawings and start-up supervision.



Automotive: Side, Roof, & Floor Cells

Our business philosophy is:

- To provide the highest quality service and support to our customers
- To supply customers with competitively priced high quality products
- To maintain technical and manufacturing leadership in our field
- To listen and act on our customers' concerns and problems
- To remain flexible to meet our customers' schedules
- To base our reputation on our products, service and actions



Bare Floor Electrodes

TECTRON™ Membrane Electrode Cells

UFS Corporation introduced the TECTRON Membrane Electrode (ME) Cell to the United States market in 1985. The TECTRON ME Cell is a flushable ME Cell used in electrocoating with most types of ED paint. It serves as the opposing electrode and removes neutralizers and other ionic contaminants from the paint bath to maintain chemical balance. The TECTRON ME Cell's round shape provides some unique benefits, including adaptable placement, low electrical resistance and ease of maintenance.

Extensive Tubular ME Cell Product Line

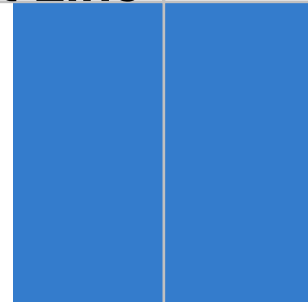
Our original TECTRON ME Cell has an Electrode diameter based upon 1-1/2" pipe. In 1998, UFS introduced the TECTRON 2" Cell, with ~25% more Electrode surface area. Further innovations resulted in the TECTRON 5" Cell, with more Electrode surface area than the typical c- cell of the same height. The TECTRON 3" Cell is our most-recent introduction, suitable in situations where there are space restrictions.

The Small Diameter group (1-1/2" and 2") has the greatest ion-exchange Membrane to Electrode ratio, providing the longest possible operational lifetimes. This group also has the most diversified anode material offering, appropriate for paint systems requiring non-ferrous materials like precious metal oxides.

The Large Diameter group (3" and 5") offer large E-coat paint system operators an economical TECTRON Cell with more Electrode area per position than the typical crescent-shaped cell.

Surface area per unit of length:

<u>size</u>	<u>per meter</u>	<u>per foot</u>
1-1/2"	0.152 m ² /m	0.497 ft ² /ft
2"	0.190 m ² /m	0.622 ft ² /ft
3"	0.280 m ² /m	0.916 ft ² /ft
5"	0.444 m ² /m	1.456 ft ² /ft



Open Top TECTRON Cell



Low Profile TECTRON Cell

		1-1/2"		2"		3"		5"	
Effective Length		Surface area		Surface area		Surface area		Surface area	
mm	inch	SM	SF	SM	SF	SM	SF	SM	SF
910	35.8	0.138	1.49	0.172	1.86	0.254	2.74	0.404	4.35
1400	55.1	0.212	2.28	0.265	2.86	0.397	4.21	0.621	6.69
1900	74.8	0.288	3.1	0.360	3.88	0.531	5.71	0.843	9.08
2300	90.6	0.349	3.75	0.436	4.69	0.642	6.91	1.021	10.99
2900	114.2	0.440	4.73	0.550	5.92	0.810	8.72	1.287	13.86

TECTRON Cell Feature List Small Diameter (1-1/2" & 2")

Standard Item	Upgrade Item	Upgrade Item Comment
Membrane Electrode Cell		
Roll ion-exchange membrane PTAR (<i>anion-selective</i>) or PTCR (<i>cation-selective</i>)	Pressed ion-exchange membrane PTAN (<i>anion-selective</i>) or PTCA (<i>cation-selective</i>)	Pressed membrane undergoes a more thorough curing process, in which the sheets become more durable than the roll type membrane that is not cured under hydraulic pressure. The result is a more uniform surface. PTAN provides a better fluid barrier between the paint bath and anolyte. A better electrical conductor, PTAN provides less electrical resistance over a long period of time. Because of its thermal conductive properties, electrode heat is dissipated to the paint bath. See Technical Reference #991113 for more information.
316L Sch 40 Electrode with 1.5 m of PVC supply tubing	316 Sch 80 / seamless precious metal anodes PME (standard) PMB (premium)	The Standard Electrode is 316L stainless steel, suitable for the vast majority of applications. For some light colored acrylic tanks more inert PME anode material is required. Premium PMB is recommended for light colored acrylic systems with high through-put requirements, such as appliance manufacturers.
Close-fitting membrane guard (2" only)	Patented membrane guard	The patented Guard is specifically designed to deter paint buildup that can lead to additional electrical resistance.
1/2" hose barb welded overflow nozzle	Threaded overflow nozzle (2" only)	Threaded nozzle designed to deter breakage or leakage under normal conditions.
Open Top	Bulkhead fitting	Converts Cell to a Low Profile design for use in square transfer or hoist type E-coat machines. (See Bulletin #991105)
PVC Sch 40 white neck	PVC Sch 60 grey neck	Thicker neck provides best support for weight of Electrode and Neck leading to longer life. Only with pressed membrane.
Installation Accessories		
1.5m (60") AWG #6 cable [75 amp capacity]	Quick connect cable lead	Quick connect makes installing, maintaining and replacing Cells a snap.
1/4" NPT PVC shutoff valve	Flow Indicator & PVC valve	Flow Indicator provides convenient visual confirmation of anolyte flow.
2 x EG conduit clamps	304 SS or Plastic	Electro-galvanized is standard, SS or plastic are available.
1.5 m return PVC tubing	n/a	n/a
n/a	Splash Guard	Keeps paint or spray mist from entering Open Top Cells
n/a	Connector Lug Set, 400 A	Allows one connection in the bus bar to hold up to five Cells.

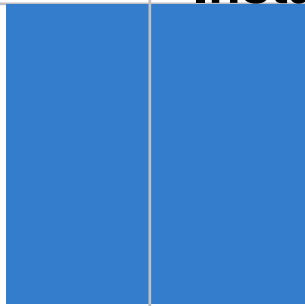
TECTRON Cell Feature List

Large Diameter (3" & 5")

Standard Item	Upgrade Item	Upgrade Item Comment
Membrane Electrode Cell		
Roll ion-exchange membrane PTAR (<i>anion-selective</i>)	n/a	n/a
316L Sch 10 Electrode with 1.5 m of PVC supply tubing	n/a	n/a
Close-Fitting membrane guard (3" only)	n/a	n/a
3/4" NPT threaded over- flow boss	n/a	Threaded nozzle designed to deter breakage or leakage under normal conditions.
Backwards compatible with C Cell mounting	n/a	n/a
Open Top	Bulkhead fitting (3" only)	Converts Cell to a Low Profile design for use in square transfer or hoist type E-coat machines.
1/2" NPT drain plug	n/a	
Installation Accessories		
1.5m (60") AWG #2 ca- ble [120 amp capacity]	Quick connect cable lead	Quick connect makes installing, maintaining and replacing Cells a snap.
1/2" NPT PVC shutoff valve	Flow Indicator & PVC valve	Flow Indicator provides convenient visual confirmation of anolyte flow.
n/a	2 x metal conduit clamps	Can be used if converting from Small Diameter TECTRON Cell
1.5 m return PVC tubing	n/a	n/a
n/a	Splash Guard	Keeps paint or spray mist from entering Open Top Cells

Installation Accessories

UFS offers electrical, mechanical, and plumbing accessories as part of our goal to provide efficient installation and operation of our products.



400 amp Copper Set Screw Lugs accept up to five Cable Leads, speeding up field electrical installation work.



Splash Guards are placed on top of the ME Cell to prevent paint drips or spray from entering the ME Cell. One required per Cell.



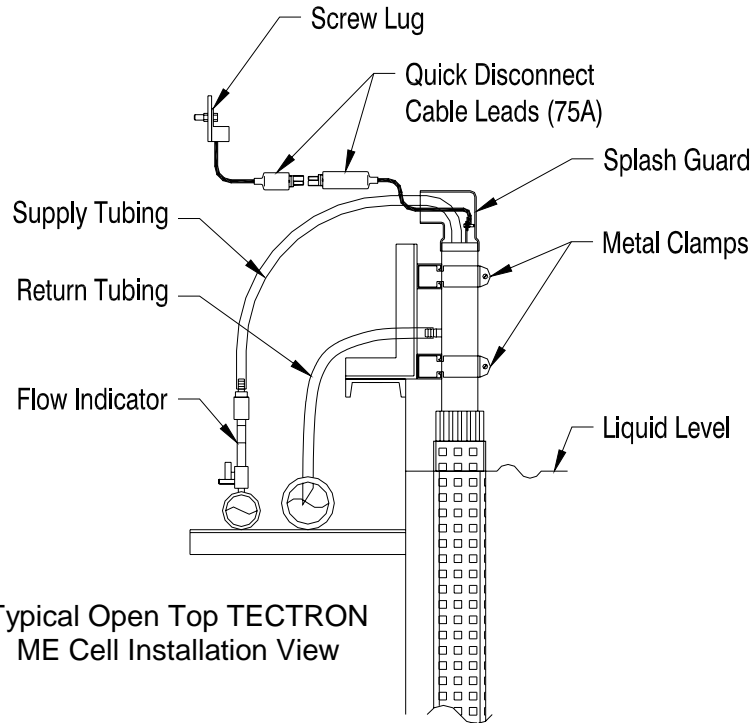
Flow Indicator displays proper flow ranges for each TECTRON Cell. One required per Cell.



Return Tubing is clear PVC and connects the overflow nozzle of the ME Cell and return manifolds. One meter (3 feet) required per Cell.



Clamps are metal, two-piece, electro-galvanized and are used for attaching ME Cells to the strut channel. Two required per Cell.



Typical Open Top TECTRON ME Cell Installation View



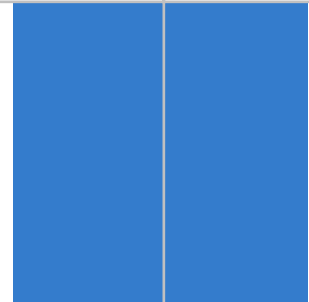
75 Amp Cable Leads have a quick disconnect and are 150 cm (5 feet) long. One required per Cell.

Cell Circulation System

As part of an electrocoat paint system, a Cell Circulation System (CCS) monitors and maintains electrolyte (either anolyte or catholyte) flow and conductivity. Electrolyte is pumped (without the use of a mechanical seal) from the CCS tank to a supply manifold on each side of the E-coat tank. Clear PVC supply tubing connects the Supply Manifold to the ME Cell. Electrolyte flows through the tubing to the ME Cell picking up neutralizer, dissolved iron and heat from the annular area between the Electrode and the Membrane. The electrolyte then flows through PVC Return Tubing to the return manifold and back to the CCS. Conductivity is maintained by adding D.I. water (or RO water), which dilutes the concentration of neutralizer and other contaminants.

The Standard CCS features a polypropylene tank, corrosion resistant magnetic drive pump, simple conductivity sensor, low liquid level sensor, strainer, and pressure gauge. There are 4 standard sizes that range from 190 l (50 gal) to 1025 l (270 gal).

The Premium CCS features a 304 stainless steel tank, vertical CPVC pump, 0—20k $\mu\text{S}/\text{cm}$ conductivity controller, low liquid level sensor, strainer, totalizing flow meter and pressure gauges. There are 4 standard sizes that range from 125 l (30 gal) to 575 l (150 gal).



Premium Cell Circulation System.

Low Profile Cells

For vertical conveyor systems, UFS offers a wide variety of Bulkheads to reduce the necessary working height of the ME Cell to a minimum. The two primary styles include a compression type fitting and a NPT thread connection.



Bulkhead uses a gasket and compression nut to seal to the Neck on top of the ME Cell. Electrode does not twist as the nut is loosened.

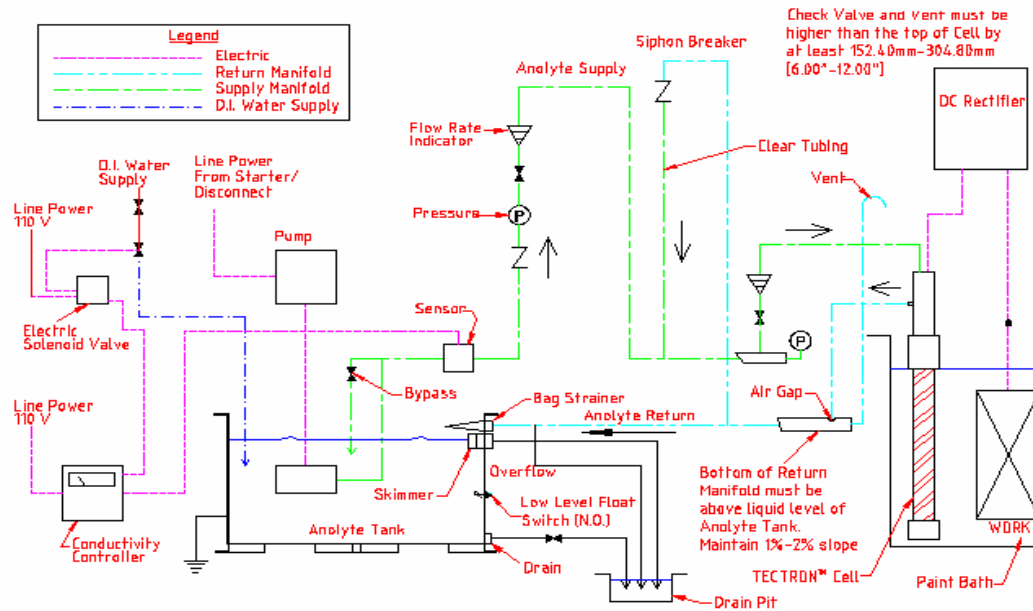


Bulkhead uses an NPT thread to create the seal. Electrode turns with the Bulkhead as it is loosened.



Typical Bulkhead Fitting

Membrane Electrode System Flow Schematic



Visit www.ufsc.com

Take time to visit www.ufsc.com to learn more about other products from UFS designed to serve your E-coat paint needs:

- Current Monitoring of ME Cells
- 7640 & 7940 Type Spiral UF Machines
- Permeate Monitoring Systems
- Virtual E-coat™ paint simulation software & consulting

UFS Corporation
330 North 400 East
Valparaiso, Indiana 46383 USA
+219-464-2027
+219-464-8646 (Fax)
www.ufsc.com
info@ufsc.com