

Technical Reference

TOPIC: Automotive Membrane Electrode Cell Comparison

The TECTRON T5 Tubular Membrane Electrode (ME) Cell is built to handle the tough environment of automotive E-coat paint system and other large industrial E-coat paint systems. Since its introduction to the automotive marketplace the T5 ME Cell has gained a reputation for being robust and long lasting; for being user friendly from installation to inspection and also for cutting costs on initial purchase leading to low lifetime operating costs. Read on below to see how the TECTRON T5 will fit into your E-coat project -



Fewer parts: The TECTRON T5 Cell is made from about 15 individual parts. Comparable Box & C Cells have as many as 100 individual parts.

More ion-exchange membrane: The T5 has a Membrane to Anode surface area ratio of 1.16:1, which is the highest. More ion-exchange membrane means lower electrical resistance & longer life. Box Cells are the worst because they are flat and thus have a 1:1 ratio. C Cells offer a ratio about 1.06:1.

Less energy consumption: Tubular design affords lower electrical energy consumption because there is less electrical resistance than Box & C Cells. Another benefit is less chilled water consumption because the tubular Cell has less voltage drop. Thus less of your energy will be turned into heat that has to be removed by the heat exchanger.



No leak points: Box and C Cells use rubber gaskets in their construction. Flanges may use as many as 50 sets of bolts, washers, and nuts creating many potential leak points. The T5 has no flange or bolted joints.

Easy inspections: The T5 Electrode can be removed and inspected and then replaced into the Membrane Shell. Try this with a Box or C Cell and you may wind up cutting the membrane or not being able to fully re-insert the anode plate.



Less weight: The T5 weights significantly less than a Box or C Cell. This translates into fewer materials and less manufacturing cost.

Please refer to the chart on the reverse side for a complete comparison between the TECTRON T5 ME Cell Vs Box & C Cell offerings.

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TECTRON T5 Vs. Box and C Cells Feature Comparison

	TUBULAR TECTRON T5 ME Cell	BOX Cells	C Cells
ELECTRODE			
Material	316L, 5.563 inch Sch. 10, pipe.	Flat 316 plate, 10 gauge or more.	Slightly bent 316 plate, 10 gauge or more.
Weight	13– 28 kg. (28–61 lbs.)	57-77 kg (125-170 lbs.)	17-34 kg. (38-74 lbs.)
Inspection	Pull from top by one person.	Remove box from tank. Crane is needed. Hard to re-insert.	Pull out from top. Crane may be needed. Hard to re-insert.
ANOLYTE			
Anolyte flow pattern & distribution	Uniform. Optimal flow completely around Electrode; no dead spots.	Uneven. Poor circulation in the corners, where bacteria can thrive and corrosion can occur.	Uneven. Poor circulation in the corners, where bacteria can thrive and corrosion can occur.
Individual flow indicators	Yes	Yes	Yes
MEMBRANE			
Types	PTAR™ Membrane verified with QA.	Common variety. Chance of uneven characteristics.	Common variety. Chance of uneven characteristics.
Membrane area vs. electrode area ratio	1.16:1	1:1	1.06:1
Replacement	Can replace shell (and/or electrode). Also can repair small tears and cuts in existing membrane shell.	Yes	Yes
HOUSING			
Construction	One piece PVC and PP, therefore no joints or holes that can leak.	Made from stock bar and sheet PVC with gasket and as many as 50 bolts.	FRP with a gasket and up to 40 bolts.
Weight	5– 9 kg. (11-20 lbs.)	Up to 68 kg. (150 lbs.).	Up to 23 kg. (50 lbs.).
MISCELLANEOUS			
Membrane Guard	Close Fitting Guard	Heavy grill "blinds" the membrane.	1: x 1" openings. Size is large enough to expose membrane to cuts from falling parts and maintenance removal tools.
Number of connections	Same as C Cell	Few	Relatively few.
Mounting	Same as Box & C Cells	Fits over square stock on lip of the E-coat tank	Fits over square stock on lip of the E-coat tank
Dirt Creation	Paint solids flow completely around the Cell. No dirt created.	Paint solids settle out on horizontal surfaces of box causing dirt.	Paint solids fall out of solution in hollow area behind cell causing dirt.
Rebuild	No need to. Membrane Shell and Electrode can be individually replaced with new spares.	Yes	Yes
Membrane repair	Repair kit allows patching of short cuts or tears.	Not practical	Not practical