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Technical Reference

Topic: TECTRON™ Anode Cell

The TECTRON Anode Cell is a flushable anode 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 Cell's round shape provide some unique benefits, including adaptable placement, low electrical resistance and quick inspections.

The standard TECTRON Cell is comprised of a stainless steel Electrode housed in a PVC and plastic Membrane Shell. Electrical current is supplied to the TECTRON Cell via a cable lead. Anolyte solution is pumped to the bottom of the Electrode through PVC tubing and then rises through the annular space between the Membrane Shell and the Electrode. It then flows through an anolyte overflow nozzle and PVC tubing to the anolyte return manifold.

This Bulletin provides a summary of our commercial experience, a description of standard and custom Cell designs, installation details, accessories, and system requirements.

EXPERIENCE

Since its U.S. introduction in 1985, the TECTRON Cell has enjoyed rapidly increasing acceptance among system designers and end-users. TECTRON Cells are now installed in over 100 tanks in North America alone. While the majority of these tanks were new installations, several were conversions from the box-style anode cell to the TECTRON Cell. As with many retrofit situations, the conversion occurred over a period of time. As box-style cells failed, they were replaced with TECTRON Cells. These long-term conversions provide the best commentary on the advantages of the TECTRON Cell, as customers had the opportunity to run both styles concurrently. UFS will be happy to provide references from customers who have made the switch to TECTRON Cells.

STANDARD TECTRON CELLS

The TECTRON Cell is available in four standard sizes based on the effective length of the Membrane Shell. These sizes are 1 m (36"), 1.4 m (45"), 1.9 m (74") and 2.0 m (114"). The length of the neck of the standard Cell can be varied as required for the tank freeboard (distance from the tank rim to normal paint level). Standard Cells offer the advantages of being readily available from stock and of being most cost effective because they are made in large quantities.

CUSTOMIZED CELLS

Several forms of customized Cells are available. First, the Cells can be manufactured to virtually any tank depth and work package size, with effective lengths that range from 30 cm (12") to more than 300 cm (10 ft.).

Different materials of construction are also available. The standard electrode is 316L stainless steel, which is preferred in the vast majority of applications. However, some applications require the use of more exotic anode materials, such as Ruthenium Oxide. This can be due to a number of factors, including unusually high electrode erosion, paint composition, or sensitivity to contamination from iron. The membrane preferred by the majority of US paint manufacturers in electrocoating is PTAN™

anion-selective. Other membrane types, such as cation-selective, are available to address particular tank requirements or system needs. Please contact your UFSc representative if you would like more detailed information on alternative anode or membrane materials.

The *Submersible Cell* can be submerged in the paint bath for installation under or directly over the work package. In this version, the standard Cell is fitted with a bulkhead fitting that seals the top of the Cell.

Low Profile Cells for use in systems with a vertical conveyor system are available as well. This version requires less than 50 mm (2") clearance above the rim of the tank. Its bulkhead fitting closes off the top of the Cell and routes the flow of anolyte and electrical power through specially designed connections.

Low Acid Removal Cells can be used instead of bare electrodes in systems where excess acid removal is a problem. Made of a proprietary membrane, Low Acid Removal cells pass electrical current but remove very little acid from the paint bath.

Ringtunnel™ -- using a combination of roof, side, and floor cells the Ringtunnel anode placement method promotes uniform film build to improve quality and save considerable amounts of paint.

INSTALLATION

Cell installation includes mechanical support, electrical supply, anolyte circulation supply, and return connections.

Mechanical support is accomplished with strut channels and pipe clamps. Galvanized metal two-piece clamps make installation easy. These clamps fit standard 1-5/8" by 1-5/8" series channel (supplied by Unistrut, B-line, or equal).

Typically, the channels are mounted with their backs 19 mm (2/4") off the tank's inside wall. The bottom channel is mounted immediately above the tank rim and the upper rim, and the upper channel is usually 150 mm (6") higher. The channels should have vertical supports (e.g., steel angle iron) every five feet. The channels also can be mounted to existing I-beams with beam clamps or welded into place.

Electrical installation consists of connecting power from the local bus bar to each Cell with a cable lead and a stainless steel 5/16" (8 mm) bolt, nut, and lock washer. A copper set screw lug, which accepts up to five individual cables, can be used to connect the cable leads to the bus bar, greatly speeding up the electrical installation work. The cable lead should be sized by the system designer taking into account the expected current draw of each cell, as specified by the paint supplier.