



PLATTLINE™ ZINC RIBBON ANODES

Cathodic Protection of Above Ground Storage Tank Bottoms

Government regulations, environmental issues and economics have made cathodic protection of above ground storage tank bottoms increasingly important. Internal corrosion occurs, generally, from crude and other stored products carrying water into the tank. The extraction process of the product itself will leave a water with an extremely high salt content, which settles to the bottom of the tank corroding the bottom from within. This circumstance can eventually cause product leakage - in fact, there are an estimated 20,000 leaking tanks each year in the United States alone. Repair costs, production down-time, product loss, clean-up costs and regulation penalty costs are just a few of the reasons that tank owners have turned to adequate corrosion prevention of AST Bottoms.

Plattline™ Zinc Ribbon Anodes are used over other galvanic anode or impressed current systems because the sand between the two bottoms will hold any moisture, thereby creating an electrolyte (a conductor) and corrosion can begin. The moisture is introduced by leaks in the tank or tank condensation. *Independent laboratory testing has shown that the pitting rate in highly conductive sand could be great enough to perforate a tank bottom in as short as three (3) years.* This electrolyte will activate **Plattline™ Zinc Ribbon Anodes** and galvanically protect the steel bottom. When the sand becomes dry, **Plattline** will regulate itself to only become active when the environment is corrosive. Magnesium has a much stronger driving potential, is not self regulating and will consume itself at a much greater rate, thus shortening the life of the application. Also, magnesium is not as flexible a material and does not easily lend itself to various design configurations.

Application to Install Plattline™

A liner is usually installed as secondary containment when retrofitting tanks with a new tank bottom. The anode is surrounded by approximately 6" to 10" of clean, dry sand and placed on top of the liner.

There are several design configurations used for **Plattline™** installations *See Diagram 1.* The specific design is determined by several factors - ease of installation, tank diameter and other engineering criteria. Usual spacing between the anode ribbon is 4 to 6 feet.

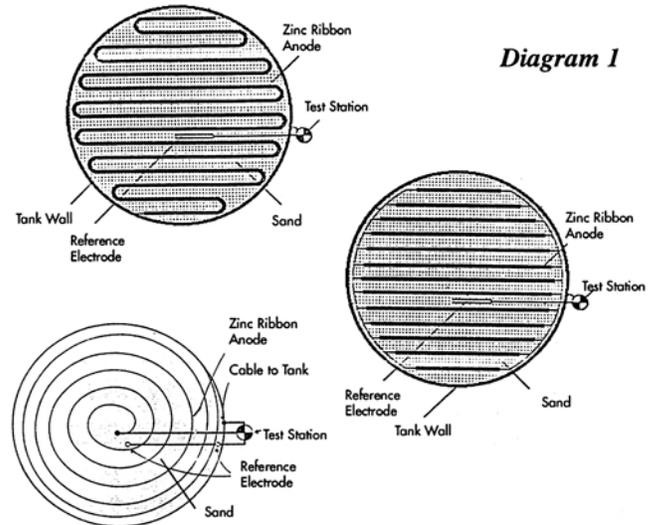


Diagram 1

Once the zinc ribbon is installed, several zinc reference cells are placed in the sand electrolyte. Lead wires to the outside of the tank enable the tank owner to monitor the cathodic protection after installation and the tank is returned to service. Multimeters, or voltmeters are used to take these electrical potential measurement readings. *See Diagram 2.*

After installation of **Plattline™**, the new bottom is then welded in place, checked for leakage and repaired and the tank is returned to service.

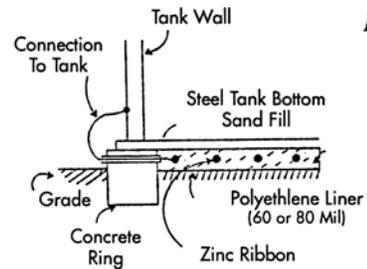


Diagram 2

Conclusions

In the actual monitoring of a 140 ft diameter tank with a double bottom, one major oil company concluded that:

- Zinc Ribbon Anodes used in a cathodic protection system only becomes effective when the sand cushion between the bottoms conductive or contaminated with moisture.
- Generally, the closer the anode spacing, the better the cathodic polarization. Under the right conditions, 8ft spacing appears to work well.
- Zinc Ribbon Anodes can effectively achieve cathodic protection of a double bottom when the electrolyte resistivity conditions are low enough to allow electrical current flow.