Model AT – Linear Anode System

Typical Applications:

- Underground and aboveground storage tanks, buried pipelines, elevator shafts, marine structures

Featuring:

- Design flexibility - modular design permits multitude of anode configurations
- Rapid installation - no field splices or weldments
- Light weight - very easy to ship and handle

Design Compatibility

The Model AT is an impressed current linear anode system that permits maximum design flexibility. It consists of copper-cored titanium flat wire coated with platinum or mixed metal oxide and attached to a #14 AWG HMW/PE insulated bus wire. A flexible plastic mesh surrounds the wire pair. Individual anodes are 50 feet (15 m) long and are easily connected in the field to form a hermetically sealed joint. This allows the design engineer to choose a layout that is best suited for the application.

Perhaps the most significant feature of the Model AT is its unique connector system. Each anode is supplied with a pin connector on one end and a socket connector on the opposite end that can be mated either to another anode section to form a string or to a power feed cable. Specially developed "tee" connectors allow intermediate current feeds on long strings. These connectors are designed for underwater cable connections and are being used successfully on other EDI products in turbulent aqueous solutions. All connections are factory made and sealed so there are no splices or weldments required in the field. Installation can be completed in substantially less time than any other system. For example, an AT anode system can be installed in a 60 foot (18 m) diameter tank in less than 6 man-hr.

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A Series
Impressed Current Anodes
Want to protect your bottom?

Only the EDI AT anode system offers you speed, safety and redundancy at the lowest installed cost.

It installs quickly

This anode takes less time to install than any other system, and no special skills are required. Two semi-skilled workers can complete a 40 foot (12 m) diameter tank in less than one hour. Tank construction schedules are minimally affected.

There’s less material to handle

All anode sections are identical and are completely pre-assembled in the factory. Order only the number of sections you need and there’s no worry about mixing-up the pieces. Each section weighs about 2 lb (1 kg). For a 65 foot (20 m) diameter tank only 35-40 lb (16 – 18 kg) of material is needed.

It’s highly redundant

The entire anode array is a single distributed anode, which is fed from both ends and intermediately as necessary. Fewer lead wires are needed with the AT system. Unlike other systems, the entire circuit will continue to perform as designed even if any wire fails. Also, it is inherently self-balancing which eliminates rectifier balancing during commissioning.

It’s safe

Since everything is pre-assembled at the factory, you simply place each 50 ft (15 m) section on the sand bed in the desired pattern and snap it together with the next piece using the unique waterproof connector attached to each end. No welding or splicing is required. No special skills, equipment or permits are necessary.

It’s the tops for your bottom!
How does the AT system compare?

Advantages over precious metal coated titanium strips field welded to titanium bars and placed in a grid array.

- Since field welding is not required, the AT system can be installed by semi-skilled labor. This substantially lowers installation costs.
- There are no long, unwieldy pieces to handle. This reduces material handling problems and installation time.
- Anode layouts can be easily modified in the field to adapt to unexpected site requirements.
- The AT’s negligible anode resistance means less attenuation (more uniform current distribution.
- Installation of a separate non-metallic shield is not necessary; it’s factory installed.
- The AT’s high conductivity buses mean fewer current feeds are required.

Advantages over precious metal coated wire or strips spliced into cables and placed in concentric circles.

- All AT anodes are the same length, which eliminates custom design, sizing and ordering.
- There are no long, unwieldy pieces to uncoil. This reduces material handling and mix-up problems.
- Anode layouts can be easily modified in the field to adapt to unexpected site requirements.
- Anodes can be interconnected to form a single circuit with multiple feed points. This eliminates the need for system balancing at the rectifier.
- The AT system has multiple layers of redundancy. Unexpected failures anywhere within the anode system will not affect its operation.

With the EDI AT system... IT'S A SNAP!
Anode
Specify as EDI Model AT-aw-nnn where
a = active surface, P for platinum or M for mixed metal oxide
w = number active anode wires, 1, 2 or 3
nnn = length, feet (50 feet is standard)

Socket End
A

Pin End

0.012" x 0.060" Cu-cored Ti flat wire with MMO or 15 uin. Pt cladding.

#14 AWG HMWPE shunt wire
poly mesh

Notes
1. When connector halves are fully mated, points A will align.
2. Current output not to exceed 10 mA/ft/wire. Use multiple wire anodes for higher current output.
3. Individual anodes may be interconnected to form strings of any desired length. Power feeds must be no more than 1,000 feet apart on single wire anodes.
4. Current should be fed into anode strings from both ends. Longer strings should have additional intermediate feeds.
5. Assemble individual anodes into strings by pressing pin end fully into socket end. The joint can be made permanent by using any solvent cement suitable for use with CPVC.

Internal Connector Specification
- Pin and socket are brass Alloy 360
- Connector body is Neoprene
- Power rating = 15 amps
- Insulation rating = 750 volts
- Minimum insulation thickness = 0.040 inches
- Contact resistance < 0.01 ohm
- Insulation resistance > 200 megohm after wet mating
- Pressure rating = 20 kpsi
- Rated for 500 wet matings

Connector shroud parts are all CPVC. The terms Pin and Socket refer to the brass connector, not the CPVC shroud.

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AT Anode String

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AT Anode String
Note: Whenconnector halves are fully mated, points A will align.

Socket End Lead Wire
Specify as EDI Model AT-SOC-nnn where nnn = wire length in feet

Connector shroud parts are all CPVC. The terms Pin and Socket refer to the brass connector, not the CPVC shroud.

Tee End Lead Wire
Specify as EDI Model AT-TEE-nnn where nnn = wire length in feet

Pin End Lead Wire
Specify as EDI Model AT-PIN-nnn where nnn = wire length in feet

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AT Anode Power Feeds

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Tee branches and end plugs are used to make short side branches in a linear anode array. Use an end lead wire rather than an end plug to increase linear circuit redundancy. Refer to EDI drawing ATAPP5 for linear anode array concepts.

Connector shroud parts are all CPVC. The terms Pin and Socket refer to the brass connector, not the CPVC shroud.
Stepped Spiral Array

Begin anode layout at access port next to ringwall and work toward the center.

Installation Detail

Anodes can be interconnected to form either one continuous string or several discrete strings. Lead wires are to be connected to both ends of anode strings. The Tee End Lead Wire is used to provide intermediate power feeds. Distance between power feeds must not exceed 1,000 feet on single wire anodes.

To ensure optimum anode performance, anode should be covered with calcined petroleum coke or fine dry sand. Make sure the material filters through the poly mesh and completely encapsulates the anode.
The AT anode system allows arrays of virtually any configuration to be assembled in the field using just a few modular components.
Caution

When installing a Model AT linear anode in earth, it must be embedded in petroleum coke or fine sand. If this is not done, the anode will not function properly and may fail prematurely. Use of petroleum coke is preferred as it will result in greater anode efficiency.

Preparation

Cut a groove about an inch deep. Line with cloth (optional). Fill groove about half full with petroleum coke (preferred) or fine dry sand.

Emplacement

Place anode on coke or sand and press in place. Cover with additional coke or sand so that anode is completely encapsulated. Fold over cloth if used. Finish backfilling with earth.