

Cathodic Protection

SAE Inc. is an innovator in advanced Cathodic Protection (CP), Electrical Grounding materials and services for the oil/gas and petrochemical industries. SAE recognizes the fundamental importance of environmental protection.

SAE's engineered patented NSF 60 systems provide the following benefits:

- Long lasting proven performance
- Environmentally sound cost effective solutions
- Lowest overall cost of ownership

SAE manufactures the following CP related products:

- **EnvirAnode®** deep bed, impressed current cathodic protection (ICCP) system is a premium product designed for high performance, long life and environmental compliance.
- **EnvirAnode® LT**, a linear MMO anode suitable for poor soil conditions.
- **Conducrete®*** conductive cementitious and carbonaceous backfill that enhances the performance, reliability and longevity of our **EnvirAnode®** CP system. Also, it can be used as AC Mitigation backfill — which has been proven to be a superior long lasting backfill for all AC Mitigation and Electrical Grounding applications.

SAE Cathodic Protection Products:

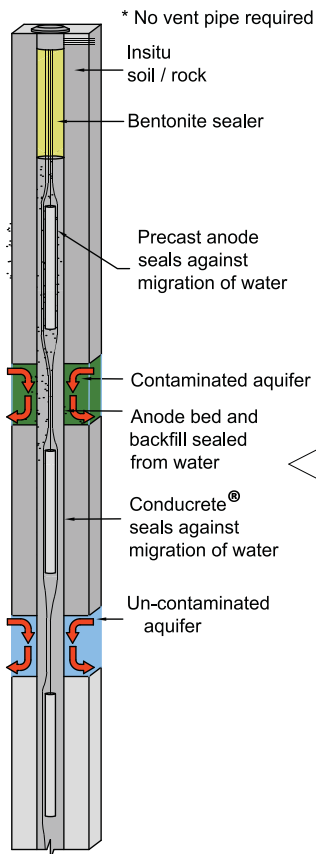
- Prevent cross-contamination of aquifers
- Eliminate possible air pollutants, acids and gases caused by traditional Cathodic Protection deep bed anode systems with vent tubes
- Offer protection throughout entire 40+ year life and beyond
- Low maintenance and eliminates decommissioning costs and liabilities
- Approved for use by various State Regulators

*SAE's Conducrete® is NSF 60 listed. This listing approves Conducrete® for use in all potable water applications and as a bore sealant.

EnvirANODE®

How EnvirAnode® Works:

- Installs similar to traditional CP systems
- SAE **Conducrete®** backfill sets solid to form a large active column that eliminates aquifer cross-contamination
- No vent pipe is required and no gas is released to the atmosphere
- Long life (40+ years) due to highly efficient electronic transfer of energy



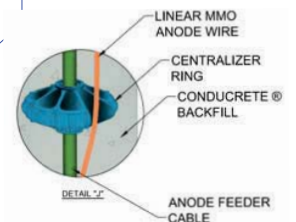
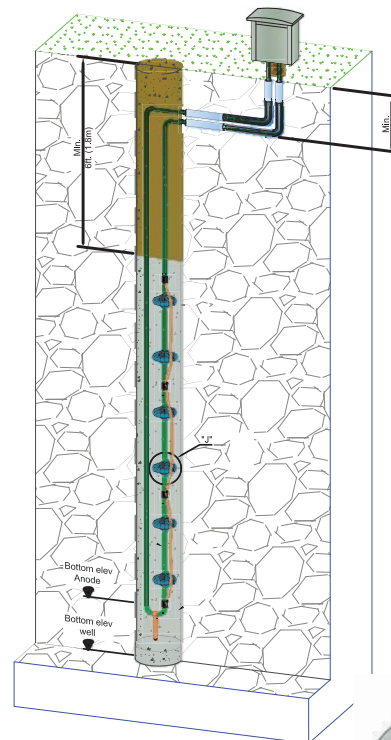
Check out our
EnvirAnode® video
on YouTube!

Detail of the SAE Inc.
New Technology
showing the anode and
backfill seal against the
migration of water between
aquifers at all levels.

EnvirANODE® LT

How EnvirAnode® LT Works:

- Linear MMO Anode
- Suitable for poor soil conditions (fractured rock)
- Suitable for lower current output applications
- Anti-theft and lower maintenance





Physical Properties:

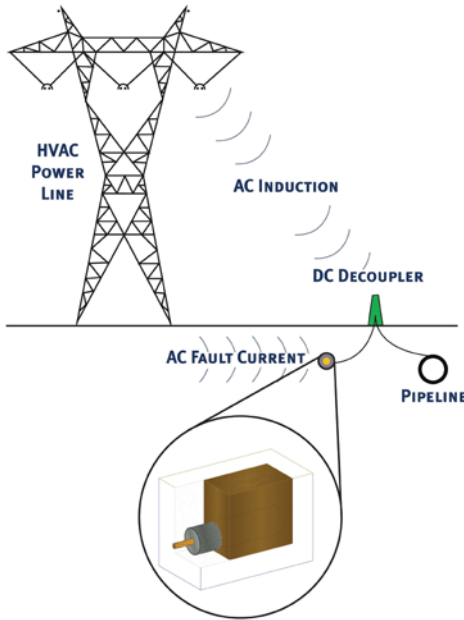
Property	Typical Value	Test Method
Wire Insulation	Kynar/HMWPE	
Minimum Bend Radius of Wire	1.25 Inches	
AEL Anode® Density	1150 kg/m ³ 71.79 lbs/ft ³	SAE Inc. Standard 104
Conducrete® Density (hardened state)	1730 kg/m ³ 108 lbs/ft ³	SAE Inc. Standard 106
Water Absorption AEL Anode® Conducrete®	10% 25.4%	SAE Inc. Standard 101 SAE Inc. Standard 110
Water Permeability AEL Anode® Conducrete®	1.72 x 10 ⁻⁷ cm/sec 2.0 x 10 ⁻⁸ cm/sec	ASTM 5084 (2.6 psi)
Environmental Impact	Neutral	Ontario Regulation 558/00 (Leachate Testing) and NSF/ANSI 60
Carbon Consumption Rate AEL Anode® Conducrete®	0.2 kg/A-year 0.5 kg/A-year	SAE Inc. Standard 111

Electrical Properties:

Property	Typical Value	Test Method
Anode Rating	5.0 A	
Resistance (AEL Anode®)	0.031 Ω	SAE Inc. Standard 105
Resistivity AEL Anode® Conducrete®	30.39 Ω·cm 2.8 – 5.0 Ω·cm	SAE Inc. Standard 105 Modified ASTM G187-05

*Leachate Data (TCLP Procedure) based on Regulation 558 performed by Testmark Laboratories Ltd.

AC Mitigation



CONDUCRETE® for AC Mitigation

SAE's innovative, engineered AC Mitigation system:

- Prevents accelerated pipeline corrosion due to high induced voltages produced by co-located electrical transmission towers.
- Excellent electrical performance with low impedance, high capacitance electrodes.
- Features large electrodes to rapidly dissipate energy and **Conducrete®** solid, water impermeable surround that reduces electrode corrosion.
- Provides extended longevity of up to 20x that of traditional systems.
- Engineered to meet or exceed NEC and CEC requirements.
- Electrodes can be installed horizontally or vertically.

Physical & Electrical Properties:

Property	Typical Value	
Appearance	Grey	
Odor	None	
	Metric	Imperial
Dry Density (Dependent on compaction)	1021 kg/m ³	64 lbs./ft ³
Wet Density (Hardened state)	1700 kg/m ³	106 lbs./ft ³
Slurry Density (mixed with 3 US gallons/bag)	1530 kg/m ³	95 lbs./ft ³
Shrinkage (28 days)	0.015%	
Permeability to Water	2.0 x 10 ⁻⁸ cm/sec	
Hygroscopic Property (water absorption)	25.4%	
Resistivity (ASTM G187-05)	2.8 to 5.0 ohm-cm	
Electrolytic Corrosion Resistance	Eliminated (95% - 100%)	
High Fault Current Test Withstand	1682 V/688 amps for 500 ms	
Environmental Impact/pH in situ	Neutral	
Dry Volume (Per 55 lb. bag)	0.023 m ³	0.886 ft ³
Slurry Volume (Per 55 lb. bag)	0.025 m ³	0.802 ft ³

