Typical Underground Tank Installation

CATHODIC PROTECTION REGULATIONS AND PRINCIPLES

NFPA 58 requires the protecting of underground tanks in accordance with good engineering practice. Cathodic protection is the accepted method of protecting underground metal structures. Tanks should be protected by installing anode bags to the factory installed anode connector. They should be coated completely, and isolated electrically with the installation of insulated unions.

TECH TIP: Soil conditions and other variables may affect number of anodes required. **Consult engineer or other appropriate professional.**

TYPICAL TANK ANODE REQUIREMENTS

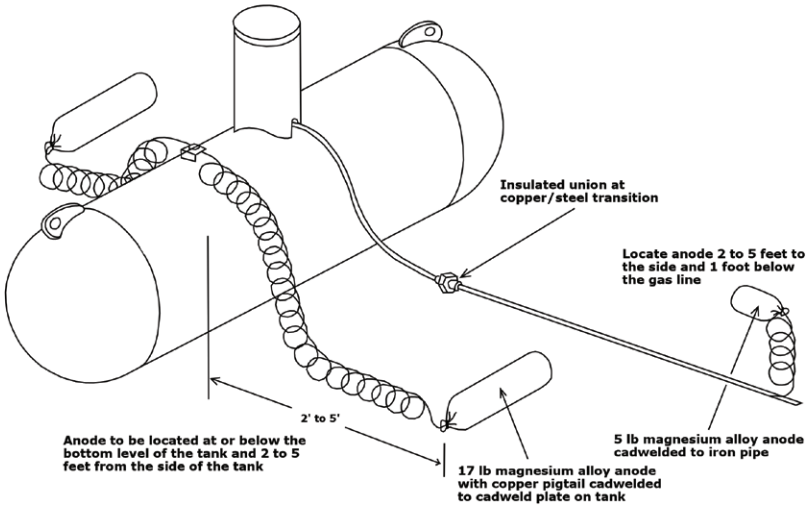
Tank size	Number of 17# Anode Bags
500 Gallon	1
1000 Gallon	2
1990 Gallon	3
3000 Gallon	4
4000 to 5000 Gallon	6
10,000 Gallon	8
15,000 Gallon	10
20,000 Gallon	12
25,000 to 30,000 Gallon	14

TYPICAL IRON PIPE ANODE REQUIREMENTS

Pipe size	Install one 5# Anode Bag for this length pipe
3/4"	500'
1"	475'
1-1/4"	450'
1-1/2"	425'
2"	400'

TYPICAL IRON PIPE ANODE REQUIREMENTS

Pipe size	Install one 17# Anode Bag for this length pipe
3"	700'
4"	500'
6"	400'
8"	350'



ANODE BAGS

Magnesium Anode Bags are 91% magnesium, 3% zinc, 6% aluminum alloy. The anodes are prepackaged in cloth bags with low resistivity, quick wetting prepared back fill consisting of 75% hydrated gypsum, 20% bentonite, and 5% sodium sulphate.

Standard magnesium anodes are most commonly used in the propane industry because they work best in the majority of underground conditions found in the United States. However, high potential anodes may be used in dry or sandy areas where it's important for greater voltage, and therefore more current. High-Potential anodes produce a minimum of minus 1.75 volts, vs 1.5 volts for standard anodes.

The anode bag should be placed into wet hole at least 2' from the tank and at a depth greater than that of the tank. Wet the area above the anode.

ANODE BAGS

RMI Part No.		Size
Standard Anode	High-Potential Anode	
MG-17	MG-17-HP	17#
MG-9	MG-9-HP	9#
MG-5	MG-5-HP	5#

SPIKE ANODES

Spike Anodes are for the protection of small underground gas lines, such as copper tubing. Comes standard with 36" cable and stainless steel adjustable pipe clamp.

SPIKE ANODE

RMI Part No.	Description
MG-DR-1.0	1 lb Spike Anode - 3/4" x 12" w/ Cable & Clamp
MG-DR-1.5	1.5 lb Spike Anode - 3/4" x 18" w/ Cable & Clamp
MG-DR-CLAMP	3/4" - 1-1/2" Adjustable Anode Clamp w/ 18" Wire
MG-DR-CLAMP-1	3/4" - 1-1/2" Adjustable Anode Clamp
MG-DR-CLAMP-2	1-1/2" - 2-1/2" Adjustable Anode Clamp
MG-DR-CLAMP-3	3-1/2" - 4-1/2" Adjustable Anode Clamp

CORROSION PROTECTION TAPES

TAPECOAT® CT 10/40W is a white cold-applied coating in tape form that consists of a heavy polymer film and synthetic elastomeric coating that bonds immediately to its own backing to provide a moisture proof seal.

COLD PRIME prepares metal surfaces for the application of cold applied tapes.

SCOTCHRAP® 50 is a tough PVC plastic tape with special high tack adhesive, formulated to resist corrosion. Easy to apply - does not use a removable plastic release film.

127732-10

MM50-2

RMI Part No.	Description
CT-200	2IN. WIDE TAPECOAT X 50FT
CT-400	4IN. WIDE TAPECOAT X 50FT
TC-1	1 GAL. COLD PRIME COATING
MM50-2	SCOTCHRAP PROTECTION 2IN x 100FT
MM50-4	SCOTCHRAP 50 PROTECT 4IN x 100FT
127732-10	SCOTCHRAP PIPE PRIMER 1 GALLON

TAPECOAT COVERAGE

Pipe size	2" Wide	4" Wide
3/4"	26.5'	-
1"	21.1'	-
1-1/4"	16.7'	-
2"	11.7'	25.1'
2-1/2"	9.6'	20.7'
3"	7.9'	17'

**Lineal feet of pipe coated per roll with minimum overlap (does not include fittings, bends, ect.)*

INSULATING UNIONS

Insulating unions are made of malleable iron with a buna-n gasket and rated to 150 PSI working pressure for vapor lines, or extra heavy forged steel with a nylon gasket and rated to 3000 PSI working pressure for liquid lines.

1U-150-034

Thread Size	150# Working Pressure	3000# Working Pressure
1/2"	1U-150-012	1U-3000-012
3/4"	1U-150-034	1U-3000-034
1"	1U-150-100	1U-3000-100
1-1/4"	1U-150-114	1U-3000-114
1-1/2"	1U-150-112	1U-3000-112
2"	1U-150-200	1U-3000-200

MEC SPACE-SAVER BRASS DIELECTRIC UNIONS

Intended to isolate metallic piping from sources of electrical current and to help prevent galvanic corrosion, the ME690 dielectric union would typically be installed at the ASME tank directly downstream of the first stage regulator but prior to underground piping and/or at the inlet of the second stage regulator above-ground at the dwelling.

ME690

RMI Part No.	Description
ME690-4-6	Brass Dielectric Union - 1/2" MPT x 3/8" Male Flare
ME690-6-6	Brass Dielectric Union - 3/4" MPT x 3/8" Male Flare
ME690-4-8	Brass Dielectric Union - 1/2" MPT x 1/2" Male Flare
ME690-6-8	Brass Dielectric Union - 3/4" MPT x 1/2" Male Flare
ME690-4-10	Brass Dielectric Union - 1/2" MPT x 5/8" Male Flare
ME690-6-10	Brass Dielectric Union - 3/4" MPT x 5/8" Male Flare

JOMAR BALL VALVE WITH DIELECTRIC UNION

1/4-turn, hot forged brass, 2-piece design, standard port, with dielectric union, appliance type gas ball valves. 100% tested.

- Reversible tamper-proof. lockable handle
- Pressure rating: 600 WOG/150 WSP
- Temp range: -40°F to 300°F
- Double Viton® O-ring stem design

101-403DU

Thread Size	RMI Part No.	Case
FNPT x FNPT		
1/2" x 1/2"	101-403DU	8
3/4" x 3/4"	101-404DU	4
FNPT x Flare		
1/2" x 1/2"	101-513DU	8
MIP x FIP		
1/2" x 1/2"	101-803DU	6
3/4" x 3/4"	101-804DU	4
MIP x Flare		
1/2" x 1/2"	101-703DU	6

Cathodic Protection Tools

HALF CELL

Used to check the potential of cathodic protection for buried tanks and piping.

The advantages over a Potential Meter:

- Gives a direct reading of potential for OPS compliant documentation vs. Go/No Go dial
- Utilizes standard digital multimeter

Use Instructions:

- Fill 1/3 full of Copper Sulfate Crystals, add distilled water, shake gently to saturate.
- Attach Multimeter Black lead to half Cell, Red lead to brass tank valve, contact moist earth several feet away from tank -.85 to -1.80 indicates good protection.
- When crystals are gone, empty and dispose of hazardous fluid, rinse with distilled water, re-prep

MODEL 6B

RMI Part No.	Description
MODEL 6B	Half Cell Reference Electrode - Pointed Tip
118027	Replacement Tip for Half Cell
16906	12 oz. Copper Crystals for Half Cell
049-011	1lb, 3oz Copper Crystals for Half Cell
049-012	32oz Anti-Freeze Solution
093-002B	Model 6B Repair Kit

JCP100 CATHODIC PROTECTION TEST KIT

JCP100 Test Kit Includes:

- Voltmeter
- Half Cell
- Test Leads
- Carrying Case

This test kit allows fast and accurate pipe to soil potential to determine anode effectiveness.

JCP100

RMI Part No.	Description
JCP100	Cathodic Protection Test Kit

C. P. MINI BOX TEST STATION

Cathodic protection test station allows for the testing of anode potential without disturbing the ground. Leads are attached to terminal block in the cap and securely fastened down. The entire cap assembly is easily lifted and tilted for testing.

TEST STATION

RMI Part No.	Description
MINIBOX	Cathodic Protection Test Station, 18"

POTENTIAL METER - TESTING CATHODIC PROTECTION

To facilitate a yearly test on installed anodes. The MCM Series Potential Meter makes this test very simple. Touch wire to tank and ground half-cell to earth. Test can be made in minutes.

For Checking The Output Of An Anode

1. Remove protective caps from meter and electrode.
2. Connect orange negative lead to tank.
3. Contact earth with electrode (the porous plug should be in contact with moist soil. Grass should not be allowed to come between plug & soil.)
4. Take and record reading & polarity. Reading should be at least -0.85 volts.
5. Replace protective cap at lower end of electrode.

MCM-1A

MCM-1D

RMI Part No.	Description
MCM-1A	Analog Electronic Potential Meter Kit w/ Case
MCM-1D	Digital Electronic Potential Meter Kit w/ Case
16203	Electrode Extension
16906	Copper Sulfate, 12oz
17105	Anti-Freeze Solution, 8oz

Cathodic Protection Tools

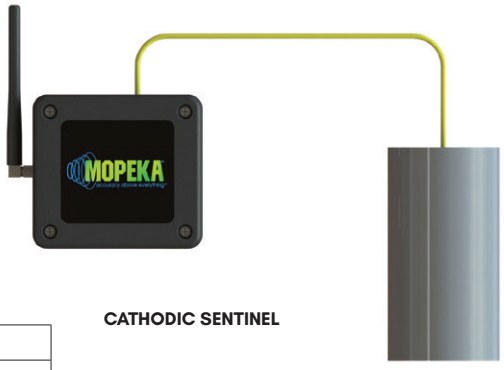
MOPEKA CATHODIC SENTINEL

Ensure you always have peace of mind around the protection of your underground tanks with the first of its kind Cathodic Sentinel by Mopeka®. The Mopeka® Cathodic Sentinel solution is designed to actively monitor and test the cathodic protection levels of your tanks in the field and send reports directly to your back office software. Rated for both Pressurized and Non-pressurized underground tanks.

Features:

- Provides safe, consistent, accurate and reliable readings for the protection of all your underground tanks
- Estimates remaining life expectancy of Anodes
- Measure ground moisture content
- Real-time readings straight to your desktop or mobile device
- Accurate voltage test
- Accurate current test
- 10-year replaceable battery
- Bluetooth, Wi-Fi, Cellular, & Satellite data transmission options
- Compliance to EPA and NFPA regulatory requirements

Contact RMI Customer Service for more information!



CATHODIC SENTINEL

Commodity	All liquids
Mounting Location	Under the Lid and in the Ground
UL, UCL, ATEX Certifications	Class 1, Division 1, Group D, Class 1, Zone 1, Group IIA, IP68
Tank Type	All Tank Types
Tank Orientation	Underground
Operating Temperature Range	-50° TO 60°C -55° TO 140°F
Default Communications	Global SIM 4G LTE CAT M1, NB-IoT, Boosted Bluetooth
Battery Life*	10 years, replaceable
Battery Type	Energizer Lithium AA.
Warranty	3 yrs

**Based on 2 updates in a 24 hour period*
***4G LTE CAT M1 or 4G LTE NB-IoT*

TECH TIP:

Cathodic Testing Requirements

According to NFPA 58; 2020 Edition; Section 6.19:

- Cathodic protection systems must produce a voltage of -0.85 or less
- Systems must be tested within 180 days of installation
- A second test must be performed 12 to 18 months after the initial test
- Periodic follow-up testing must be conducted no more than every 36 months
- If a failure occurs, it must be corrected within 180 days, and the installer must restart the testing cycle as if it is a new installation
- Installers should retain documentation on the last 2 tests