

Cathodic Protection of Aboveground Petroleum Storage Tanks

API RECOMMENDED PRACTICE 651
THIRD EDITION, JANUARY 2007



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Downstream Segment

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Persons planning to construct an aboveground storage facility, replace existing aboveground storage tanks and associated piping systems, or cathodically protect existing aboveground storage tanks and associated piping should refer to applicable local, state, and federal fire, safety, and environmental regulations as well as the most recent edition of the following publications:

- a. API Std 650;
- b. API RP 652;
- c. API Std 653;
- d. API Spec 12B;
- e. API Spec 12D;
- f. API Spec 12F;
- g. API Std 2610;
- h. NACE RP0193;
- i. NACE RP0285;
- j. NFPA 30;
- k. NFPA 70; and
- l. PEI RP200.

The appropriate government authority having jurisdiction should be consulted for regulations that apply to the area of installation prior to taking any action suggested in this recommended practice.

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CONTENTS

	Page
1 SCOPE.....	1
2 REFERENCES	1
2.1 Standards, Codes, Publications, and Specifications	1
2.2 Other References	2
3 DEFINITIONS.....	2
4 CORROSION OF ABOVEGROUND STEEL STORAGE TANKS	3
4.1 Introduction	5
4.2 Corrosion Mechanisms	6
4.3 Internal Corrosion	7
5 DETERMINATION OF NEED FOR CATHODIC PROTECTION	8
5.1 Introduction	8
5.2 Tank History.....	9
5.3 Tank Pad and Soil Conditions	10
5.4 Other Factors Affecting Cathodic Protection	13
6 METHODS OF CATHODIC PROTECTION FOR CORROSION CONTROL	14
6.1 Introduction	14
6.2 Galvanic Systems.....	14
6.3 Impressed Current Systems.....	15
7 DESIGN OF CATHODIC PROTECTION SYSTEMS.....	16
7.1 Introduction	16
7.2 Influence of Replacement Bottoms, External Liners (Release Prevention Barriers), and Secondary Containment on Cathodic Protection System Design	17
7.3 External Cathodic Protection.....	19
7.4 Internal Cathodic Protection	23
8 CRITERIA FOR CATHODIC PROTECTION	23
8.1 Introduction	23
8.2 Protection Criteria	23
8.3 Measurement Techniques	24
8.4 Alternative Reference Electrodes	24
9 INSTALLATION OF CATHODIC PROTECTION SYSTEMS	25
9.1 Introduction	25
9.2 Galvanic Anode Systems.....	25
9.3 Impressed Current Systems.....	26
9.4 Corrosion Control Test Stations, Undertank Monitoring Methods, and Bonds	29
10 INTERFERENCE CURRENTS	30
10.1 Introduction	30
10.2 Sources of Interference Currents.....	31
10.3 Detection of Interference Currents	31
10.4 Control of Interference Currents	31

11	OPERATION AND MAINTENANCE OF CATHODIC PROTECTION SYSTEMS	31
11.1	Introduction	31
11.2	Safety	32
11.3	Cathodic Protection Surveys	32
11.4	Cathodic Protection Records	33

Figures

1	Electrochemical Corrosion Cell	5
2	Oxygen Concentration Cell Caused by Rocks or Clay in Tank Pad	6
3	Example of Stray Current Corrosion of an Unprotected Tank Bottom	7
4	Galvanic Corrosion	7
5	Cathodic Protection with Galvanic Anodes	5
6	Impressed Current Cathodic Protection	15
7	Impervious External Liner Beneath Storage Tank	17
8	New Steel Bottom on Top of Old Bottom	18
9	Current Requirement Test Setup	22
10	Potential Measurement Schematic	25
11	Typical Galvanic Anode Installation	26
12	Typical Shallow Anode Bed Installation	27
13	Commonly Installed Deep Anode Bed	28
14	Permanently Installed Reference Electrode and Test Station	29
15	Perforated Pipe Installed for Reference Electrode	30

Tables

1	General Classification of Resistivity	10
2	Partial Galvanic Series	14
3	Commonly Used Reference Electrodes	25

Cathodic Protection of Aboveground Petroleum Storage Tanks

1 Scope

1.1 The purpose of this recommended practice is to present procedures and practices for achieving effective corrosion control on aboveground storage tank bottoms through the use of cathodic protection. It contains provisions for the application of cathodic protection to existing and new storage tanks. Corrosion control methods based on chemical control of the environment or the use of protective coatings are not covered in detail.

1.2 When cathodic protection is used for aboveground storage tank applications, it is the intent of this recommended practice to provide information and guidance specific to aboveground steel storage tanks in hydrocarbon service. Certain practices recommended herein may also be applicable to tanks in other services. It is intended to serve only as a guide to persons interested in cathodic protection. Specific cathodic protection designs are not provided. Such designs should be developed by a person thoroughly familiar with cathodic protection practices.

1.3 This recommended practice does not designate specific practices for every situation because the varied conditions in which tank bottoms are installed preclude standardization of cathodic protection practices.

2 References

2.1 STANDARDS, CODES, PUBLICATIONS, AND SPECIFICATIONS

Unless otherwise specified, the most recent editions or revisions of the following standards, codes, and specifications shall, to the extent specified herein, form a part of this standard.

API

Spec 12B	<i>Bolted Tanks for Storage of Production Liquids</i>
Spec 12D	<i>Field Welded Tanks for Storage of Production Liquid</i>
Spec 12F	<i>Shop Welded Tanks for Storage of Production Liquids</i>
RP 500	<i>Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities</i>
RP 575	<i>Inspection of Atmospheric and Low Pressure Storage Tanks</i>
Std 620	<i>Design and Construction of Large Welded, Low-pressure Storage Tanks</i>
Std 650	<i>Welded Steel Tanks for Oil Storage</i>
RP 652	<i>Lining of Aboveground Petroleum Storage Tank Bottoms</i>
Std 653	<i>Tank Inspection, Repair, Alteration, and Reconstruction</i>
RP 1615	<i>Installation of Underground Petroleum Product Storage Systems</i>
RP 1621	<i>Bulk Liquid Stock Control at Retail Outlets</i>
RP 1632	<i>Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems</i>
RP 2003	<i>Protection against Ignitions Arising Out of Static, Lightning, and Stray Currents</i>

ASTM¹

C 144	<i>Standard Specification for Aggregate for Masonry Mortar</i>
C 778	<i>Standard Specification for Standard Sand</i>
D 512	<i>Standard Test Methods for Chloride Ion in Water</i>
D 516	<i>Standard Test Method for Sulfate Ion in Water</i>
D 1557	<i>Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))</i>
G 522	<i>Standard Test Method for Measuring pH of Soil for Use in Corrosion Testing</i>
D 577	<i>Method for Field Measurement of Soil Resistivity Using the Wenner Four Electrode Method</i>

EPA²

8260-A ² 0376.1	<i>Test Method for Sulfide—Titrimetric Iodine</i>
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¹ASTM International, 100 Bar Harbor Drive, West Conshohocken, Pennsylvania 19428, www.astm.org.

²U.S. Environmental Protection Agency, Ariel Rios Building, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460, www.epa.gov.