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Sincerely,

Jack Gerard

President and Chief Executive Officer
API

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GENERAL: OIL FIELD EQUIPMENT AND MATERIALS

The API Composite List

This is a directory of companies licensed to use the API Monogram and APIQR Registration Mark. This directory also lists the companies who have registered Perforator Designs with API, companies who participate in API's Training Provider Certification Program (TPCP), and ISO 14001 registered firms. It provides an alphabetical list of approximately 3,000 manufacturers licensed (at the time of publication) to mark their products with the API Monogram. It also contains a classified listing (by specific API specification) of these licensed manufacturers, as well as approximately 700 APIQR ISO 9000 registered firms. This directory was developed to assist those individuals desiring to purchase products and services meeting API specifications from companies whose quality systems and capabilities are verified by API's Training and Certification Programs. It is updated and published quarterly. A searchable on-line version of the composite list is continuously updated and can be found at http://www.api.org/compositelist.

Free*

Spec Q1/ISO 29001:2007 ◆

Specification for Quality Programs for the Petroleum and Natural Gas Industry

Petroleum petrochemical and natural gas industries—Sector-specific quality management systems—Requirements for product and service supply organizations

This specification defines the quality management system requirements for the design, development, production, installation and service of products for the petroleum, petrochemical and natural gas industry. This specification also sets forth the minimum quality management system requirements, which applied in conjunction with API industry standards, are necessary to obtain a license to use the API monogram.

This edition of API Spec Q1 is the identical national adotpion of ISO 29001, *Petroleum petrochemical and natural gas industries—Sector-specific quality management systems—Requirements for product and service supply organizations.* This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 29

8th Edition | December 2007 | Product Number: GXQ108 | Price: $102.00

Spec Q1/ISO 29001:2007 *

Specification for Quality Programs for the Petroleum and Natural Gas Industry—Russian

Russian translation of Specification Q1.

8th Edition | December 2007 | Product Number: GQ1007R | Price: $107.00

API Specification Q1 Training for Quality Programs

www.api-u.org/Q1.html

In two information-packed days you'll get an overview of the requirements of API Spec Q1, what makes it so valuable, and why you need to know about these essential elements of the program.

OFFSHORE STRUCTURES

RP 2A-WSD

Planning, Designing and Constructing Fixed Offshore Platforms—Working Stress Design

(includes Errata/Addenda dated December 2002, Errata/Supplement dated October 2005 and Errata/Supplement dated October 2007)

This document contains requirements for the design and construction of new platforms and for the relocation of existing platforms used for drilling, development, and storage of hydrocarbons in offshore areas. In addition, guidelines are provided for the assessment of existing platforms in the event that it becomes necessary to make a determination of the "fitness for purpose" of the structure. Pages: 226

21st Edition | December 2000 | Product Number: G2AWSD | Price: $341.00

RP 2A-WSD-S2

Errata/Supplement 2 to Planning, Designing and Constructing Fixed Offshore Platforms—Working Stress Design

Contains new provisions for determining joint strength criteria, greatly expanded fatigue design considerations, and an improved presentation and discussion for the assessment of existing platforms. Also included are additional errata items and updated references to other standards. Pages: 92

21st Edition | October 2005 | Product Number: G2AWSDS | Price: $118.00

Spec 2B ◆

Fabrication of Structural Steel Pipe

Covers the fabrication of structural steel pipe formed from plate steel with longitudinal and circumferential butt-welded seams. Pipe is typically in sizes of 14 in. outside diameter and greater, with a wall thickness $^{3}/_{8}$ in. and greater (up to a nominal 40 ft in length) and is suitable for use in construction of welded offshore structures. The use of the ERW process or spiral welded pipe is not included in this specification. Pipe fabricated under this specification is intended to be used primarily in piling and main structural members, including tubular truss connections, where internal stiffeners are not usually required. Pages: 8

6th Edition | July 2001 | Reaffirmed: February 16, 2007
Product Number: G02B06 | Price: $80.00

Spec 2C ◆

Offshore Cranes

Details the requirements for design, construction, and testing of offshore pedestal mounted cranes. Offshore cranes are defined in this specification as pedestal mounted elevating and rotating lift devices for transfer of materials or personnel to or from marine vessels and structures. Offshore cranes are typically mounted on a fixed (bottom supported) or floating platform structure used in drilling and production operations. API Spec 2C is not intended to be used for the design, fabrication, and testing of davits and/or emergency escape devices. API Spec 2C is also not intended to be used for shipboard cranes or heavy lift cranes. Pages: 58

6th Edition | March 2004 | Effective Date: September 1, 2004
Product Number: G02C06 | Price: $129.00

RP 2D

Operation and Maintenance of Offshore Cranes

This recommended practice is intended to serve as a guide to crane owners and operators in developing operating and maintenance practices and procedures for use in the safe operation of pedestal-mounted revolving cranes on fixed or floating offshore platforms, jackup drilling rigs, semi-submersible drilling rigs and other types of mobile offshore drilling units

* These translated versions are provided for the convenience of our customers and are not officially endorsed by API. The translated versions shall neither replace nor supersede the English-language versions, which remain the official Standards. API shall not be responsible for any discrepancies or interpretations of these translations. Translations may not include any Addenda or Errata to the document. Please check the English-language versions for any updates to the documents.

(MODUs). Guidelines are also given for the pre-use inspection and testing of temporary cranes (also called self-erecting, leapfrog or bootstrap cranes) that are erected offshore. Pages: 54

6th Edition | May 2007 | Product Number: G02D06 | Price: $120.00

Spec 2F ◆
Mooring Chain

This specification covers flash-welded chain and forged kenter connecting links used for mooring of offshore floating vessels such as drilling vessels, pipe lay barges, derrick barges, and storage tankers. Pages: 16

6th Edition | June 1997 | Reaffirmed: May 16, 2003
Product Number: G02F06 | Price: $86.00

RP 2FB
Recommended Practice for Design of Offshore Facilities Against Fire and Blast Loading

Provides an assessment process for the consideration of fire and blast in the design of offshore structures and includes guidance and examples for setting performance criteria. This document complements the contents of the Section 18 of API RP 2A-WSD, 21st Edition with more comprehensive guidance in design of both fixed and floating offshore structures against fire and blast loading. Guidance on the implementation of safety and environmental management practices and hazard identification, event definition and risk assessment can be found in API RP 75 and the API RP 14 series. The interface with these documents is identified and emphasized throughout, as structural engineers need to work closely with facilities engineers experienced in performing hazard analysis as described in API RP 14J, and with the operator's safety management system as described in API RP 75. Pages: 63

1st Edition | April 2006 | Product Number: G2FB01 | Price: $152.00

RP 2FPS
Recommended Practice for Planning, Designing, and Constructing Floating Production Systems

This recommended practice provides guidelines for design, fabrication, installation, inspection and operation of floating production systems (FPSs). A FPS may be designed with the capability of one or more stages of hydrocarbon processing, as well as drilling, well workover, product storage, and export. This document addresses only floating systems where a buoyant hull of some form supports the deck, production, and other systems. Bottom-fixed components, such as self-supporting risers, and station keeping systems, such as turret mooring, catenary anchor leg mooring (CALM), single anchor leg mooring (SALM), etc. are considered as ancillary components and are addressed in more detail in other API recommended practices. Pages: 95

1st Edition | March 2001 | Product Number: G2FPS1 | Price: $165.00

Spec 2H ◆
Carbon Manganese Steel Plate for Offshore Platform Tubular Joints

Covers two grades of intermediate strength steel plates up to 4 in. thick for use in welded construction of offshore structures, in selected critical portions which must resist impact, plastic fatigue loading, and lamellar tearing. These steels are intended for fabrication primarily by cold forming and welding as per API Spec 2B. The welding procedure is of fundamental importance and it is presumed that procedures will be suitable for the steels and their intended service. Conversely, the steels should be amenable to fabrication and welding under shipyard and offshore conditions. Pages: 24

9th Edition | July 2006 | Effective Date: February 1, 2007
Product Number: G02H09 | Price: $91.00

Bull 2HINS
Guidance for Post-hurricane Structural Inspection of Offshore Structures

This bulletin provides guidance for above- and below-water post-hurricane structural inspections of fixed and floating structures in the Gulf of Mexico. The goal of these special inspections is to determine if a structure sustained hurricane-induced damage that affects the safety of personnel, the primary structural integrity of the asset, or its ability to perform the purpose for which it was intended. This document should be used in conjunction with the applicable API RPs for the structure as well as any structure specific owner or regulatory requirements. Pages: 16

1st Edition | May 2009 | Product Number: G2HINS01 | Price: $80.00

RP 2I
In-Service Inspection of Mooring Hardware for Floating Drilling Units

RP 2I provides guidelines for inspecting mooring components of mobile offshore drilling units (MODUs) and permanent floating installations. This edition includes:

- inspection guidelines for steel permanent moorings on permanent floating installations are added;
- inspection guidelines for fiber ropes used for permanent and MODU moorings are included;
- special guidance for MODU mooring inspection in the areas of tropical cyclone is provided.

Although this recommended practice was developed for the primary moorings of MODUs and permanent floating installations, some of the guidelines may be applicable to moorings of other floating vessels such as pipe-laying barges and construction vessels. Also some of the guidelines may be applicable to secondary or emergency moorings such as mooring for jack-up units, shuttle tanker mooring, and dynamic positioning (DP) vessel harbor mooring. The applicability of this document to other floating vessels and moorings is left to the discretion of the user. Pages: 73

3rd Edition | April 2008 | Product Number: G02103 | Price: $143.00

Bull 2INT-DG
Interim Guidance for Design of Offshore Structures for Hurricane Conditions

This bulletin provides guidance on the use of updated hurricane winds, waves, surge and current conditions in API Bull 2INT-MET in the design of offshore structures in the Gulf of Mexico, particularly in the central region and its adjoining transitions. This bulletin is intended to cover the design of the structural systems of the following types of offshore platforms:

- steel jacket or template platforms, towers and compliant towers;
- minimum non-jacket and special structures (including caissons) defined in API RP 2A-WSD;
- tension leg platforms;
- moored, floating platforms (semi-submersible shaped, spar shaped, ship shaped).

Bulletin 2INT-DG should be used in conjunction with RP 2A-WSD, Bull 2TD, RP 2T, RP 2FPS, RP 2SK, and RP 2RD. Pages: 9

1st Edition | May 2007 | Product Number: G2DGINT | Price: $55.00

Bull 2INT-EX
Interim Guidance for Assessment of Existing Offshore Structures for Hurricane Conditions

This bulletin provides guidance on the use of updated hurricane winds, waves, surge and current conditions in API Bull 2INT-MET for the assessment of existing offshore structures in the Gulf of Mexico, particularly in the central region and its adjoining transitions. This bulletin is intended to cover the design of the structural systems of the following types of offshore platforms:

- steel jacket or template platforms, towers and compliant towers;
- minimum non-jacket and special structures (including caissons) defined in RP 2A-WSD;
- tension leg platforms;

- moored, floating platforms (semi-submersible shaped, spar shaped, ship shaped).

Bulletin 2INT-EX should be used in conjunction with RP 2A-WSD, Bull 2TD, RP 2T, RP 2FPS, RP 2SK, and RP 2RD. Pages: 11

1st Edition | May 2007 | Product Number: G2EXINT | Price: $55.00

Bull 2INT-MET
Interim Guidance on Hurricane Conditions in the Gulf of Mexico

Presents hurricane-driven metocean conditions (wind, wave, current and surge) for use with and reference by other API standards. These conditions are intended to replace the conditions currently found in API RP 2AWSD. The hurricane metocean conditions presently contained in the 21st Edition of API RP 2A have not been updated since 1993. Since that time, several major severe storms, most notably Opal (1995), Ivan (2004) and Katrina (2005) have affected the Gulf, resulting in increases to local extremes in the areas affected by these storms. Most importantly, however, industry's understanding of hurricane risk has continues to evolve. A new set of hurricane conditions have been derived for reference by other API standards using the latest hindcast storm record and incorporating the industry's best understanding to date of the regional dependence of storm intensity. Conditions are presented for four regions: West, West Central, Central, and East. Pages: 54

1st Edition | May 2007 | Product Number: G2INTMET | Price: $82.00

RP 2L
Planning, Designing and Constructing Heliports for Fixed Offshore Platforms

Provides a guide for planning, designing, and constructing heliports for fixed offshore platforms. It includes operational consideration guidelines, design load criteria, heliport size and marking recommendations, and other heliport design recommendations. Pages: 14

4th Edition | May 1996 | Effective Date: June 1, 1996
Reaffirmed: March 27, 2006 | Product Number: G02L04 | Price: $80.00

Spec 2MT1 ◆
Carbon Manganese Steel Plate With Improved Toughness for Offshore Structures

This specification covers one grade of intermediate strength steel plates for use in welded construction of offshore structures. These steels are intended for fabrication primarily by cold forming and welding as per API Spec 2B. The primary use of these steels is for Class "B" applications as defined in API RP 2A. API Specs 2H, 2W, and 2Y cover other steels providing improved mechanical properties and toughness for Class "A" applications and should be used where substantial z-direction stresses are expected. Pages: 6

2nd Edition | September 2001 | Effective Date: March 1, 2002
Product Number: G2MT12 | Price: $80.00

Spec 2MT2 ◆
Rolled Shapes with Improved Notch Toughness

This specification covers rolled shapes (wide flange shapes, angles, etc.), having a specified minimum yield strength of 50 ksi (345 Mpa), intended for use in offshore structures. Commonly available Class A, Class B, and Class C beams refer to degrees of fracture criticality as described in API RP 2A-WSD, with Class C being for the least critical applications. For special critical applications, Class AAZ shapes may be specified, by agreement, using Supplement S101. Pages: 8

1st Edition | June 2002 | Effective Date: December 1, 2002
Product Number: G2MT21 | Price: $76.00

RP 2N
Planning, Designing, and Constructing Structures and Pipelines for Arctic Conditions
(includes Errata dated December (2009)

Contains considerations that are unique for planning, designing, and constructing Arctic systems. Used with other applicable codes and standards like API RP 2A or RP 1111, this recommended practice provides guidance to those involved in the design of Arctic systems. The systems covered in this recommended practice for the Arctic environment include:

- offshore concrete, steel, and hybrid structures, sand islands, and gravel islands used as platforms for exploration drilling or production;
- offshore ice islands used as platforms for exploration drilling;
- near shore causeways;
- offshore pipelines;
- shore crossings for pipelines. Pages: 82

2nd Edition | December 1995 | Reaffirmed: April 16, 2007
Product Number: G02N02 | Price: $137.00

RP 2RD
Design of Risers for Floating Production Systems (FPSs) and Tension-Leg Platforms (TLPs)
(includes Errata dated June 2009)

This document addresses structural analysis procedures, design guidelines, component selection criteria and typical designs for all new riser systems used on FPSs. Guidance is also given for developing load information for the equipment attached to the ends of the risers. The recommended practice for structural design of risers, as reflected in this document, is generally based on the principles of limiting stresses in the risers and related components under normal, extreme, and accidental conditions. This document assumes that the risers will be made of steel or titanium pipe or unbonded flexible pipe. However, other materials, such as aluminum, are not excluded if risers built using these materials can be shown to be fit for purpose. Design considerations for unbonded flexible pipe are included primarily by reference to API RP 17B and API Spec 17J. Pages: 163

1st Edition | June 1998 | Reaffirmed: May 12, 2006
Product Number: G02RD1 | Price: $203.00

Bull 2S
Design of Windlass Wildcats for Floating Offshore Structures

Covers the design of windlass wildcats to ensure proper fit and function between wildcat and mooring chain. Wildcats are of the five-whelp type for use with studlink anchor chain conforming to the classification society grades 1,2 and 3, ORQ and Grade 4 chain. Wildcat dimensions are provided for chains in integral $^{1}/_{8}$ in. (3 mm) steps, ranging in size from 2 in. to 4 in. (51 mm to 102 mm). Wildcat dimensions for chain in intermediate $^{1}/_{16}$ in. (1.5 mm) steps are not provided, but wildcats in these sizes are permitted within the scope of this publication. Pages: 7

2nd Edition | November 1995 | Reaffirmed: January 1, 2001
Product Number: G02S02 | Price: $73.00

RP 2SK
Design and Analysis of Stationkeeping Systems for Floating Structures
(includes Addendum 1 dated May 2008)

Presents a rational method for analyzing, designing or evaluating mooring systems used with floating units. This method provides a uniform analysis tool which, when combined with an understanding of the environment at a particular location, the characteristics of the unit being moored, and other factors, can be used to determine the adequacy and safety of the mooring system. Some design guidelines for dynamic positioning systems are also included.

Appendix K of 2SK replaces Recommended Practice 95F. Pages 181

3rd Edition | October 2005 | Product Number: G2SK03 | Price: $123.00

RP 2SM
Recommended Practice for Design, Manufacture, Installation, and Maintenance of Synthetic Fiber Ropes for Offshore Mooring

Provides guidelines on the use of synthetic fiber ropes for offshore mooring applications. The secondary purpose of this document is to highlight differences between synthetic rope and traditional steel mooring systems, and to provide practical guidance on how to handle these differences during system design and installation. Pages: 55

1st Edition | March 2001 | Product Number: G02SM1 | Price: $165.00

RP 2T
Planning, Designing and Constructing Tension Leg Platforms

Provides an efficient approach to the design, fabrication, and installation of a tension leg platform (TLP) system. RP 2T has guidelines developed from successful practices employed for related structural systems in the offshore and marine industries. Emphasis is placed on participation of all engineering disciplines during each stage of planning, development, design, construction, installation, and inspection. Pages: 129

2nd Edition | August 1997 | Product Number: G02T02 | Price: $182.00

Bull 2TD
Guidelines for Tie-downs on Offshore Production Facilities for Hurricane Season

Addresses the need to evaluate the tie-downs in use on offshore production facilities for drilling rigs, permanent equipment, and facilities such as quarters, helidecks, etc. The information contained in this document is presented as recommendations to improve tie-down performance during hurricanes. Bulletin 2TD also addresses situations where failure of a drilling or workover rig would result in significant damage to the platform or adjacent infrastructure. Pages: 3

1st Edition | June 2006 | Product Number: G2TD01 | Price: $49.00

Bull 2U
Stability Design of Cylindrical Shells

Contains semi-empirical formulations for evaluating buckling strength of stiffened and unstiffened cylindrical shells. Pages: 146

3rd Edition | June 2004 | Product Number: C02U03 | Price: $185.00

Bull 2V
Design of Flat Plate Structures

Provides guidance for the design of steel flat plate structures. Pages: 139

3rd Edition | June 2004 | Product Number: G02V03 | Price: $185.00

Spec 2W ◆
Steel Plates for Offshore Structures, Produced by Thermo-Mechanical Control Processing (TMCP)

Covers two grades of high strength steel plates for use in welded construction of offshore structures, in selected critical portions which must resist impact, plastic fatigue loading, and lamellar tearing. Grade 50 is covered in thicknesses up to 6 in. (150 mm) inclusive, and Grade 60 is covered in thicknesses up to 4 in. (100 mm) inclusive. Pages: 15

5th Edition | December 2006 | Effective Date: June 1, 2007
Product Number: G02W05 | Price: $91.00

RP 2X
Ultrasonic and Magnetic Examination of Offshore Structural Fabrication and Guidelines for Qualification of Technicians

Contains recommendations for determining the qualifications of technicians conducting inspections of offshore structural fabrication using ultrasonic and magnetic devices. Recommendations are also given for control of inspections in a general quality control program. Pages: 77

4th Edition | May 2004 | Product Number: G02X04 | Price: $142.00

Spec 2Y ◆
Specification for Steel Plates, Quenched-and-Tempered, for Offshore Structures

Covers two grades of high strength steel plate for use in welded construction of offshore structures, in selected critical portions which must resist impact, plastic fatigue loading, and lamellar tearing. Grade 50 is covered in thicknesses up to 6 in. (150 mm) inclusive, and Grade 60 is covered in thicknesses up to 4 in. (100 mm) inclusive. Pages: 13

5th Edition | December 2006 | Effective Date: June 1, 2007
Product Number: G02Y05 | Price: $91.00

RP 2Z
Preproduction Qualification for Steel Plates for Offshore Structures

Covers requirements for preproduction qualification, by special welding and mechanical testing, of specific steelmaking and processing procedures for the manufacture of steel of a specified chemical composition range by a specific steel producer. This is a Recommended Practice for material selection and qualification, but not for the performance of production weld joints. This Recommended Practice was developed in conjunction with, and is intended primarily for use with, API Specs 2W and 2Y. However, it may be sued as a supplement to other material specifications (e.g. API Spec 2H) if so desired. Pages: 19

4th Edition | September 2005 | Product Number: G02Z04 | Price: $115.00

RP 95J
Gulf of Mexico Jackup Operations for Hurricane Season—Interim Recommendations

Presents an interim approach to siting jackup mobile offshore drilling units (MODUs) and to recommend certain operational procedures to enhance Jackup survivability and stationkeeping during hurricane season in the Gulf of Mexico during drilling, workover and while stacked (idled) at a non-sheltered location. This RP provides guidance and processes and when combined with an understanding of the environment at a particular location, the characteristics of the unit being utilized, and other factors, may be used to enhance operational integrity. This RP was developed through a cooperative arrangement with the International Association of Drilling Contractors' (IADC) Jackup Rig Committee. Specifically, this RP provides guidance in the following areas:

- site-including location-specific, geotechnical, and metocean;
- preloading process;
- air gap recommendations;
- unit preparations and evacuation;
- post storm recovery; and
- post storm inspections. Pages: 15

1st Edition | June 2006 | Reaffirmed: February 15, 2008
Product Number: G95J01 | Price: $60.00

DERRICKS AND MASTS

Spec 4F ◆
Drilling and Well Servicing Structures

Covers the design, manufacture, and use of steel derricks, portable masts, crown block assemblies, and substructures suitable for drilling and well-servicing operations in the petroleum industry. It includes requirements for marking, inspection, a uniform method of rating, and design loading for the equipment. This document provides two product specification levels (PSLs) that define two levels of technical and quality requirements. Pages: 45

3rd Edition | January 2008 | Effective Date: July 1, 2008
Product Number: G04F03 | Price: $93.00

RP 4G
Recommended Practice for Use and Procedures for Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures
(includes Errata dated June 2004)

Provides guidelines and establishes recommended procedures for inspection, maintenance and repair of items for drilling and well servicing structures to maintain equipment serviceability. Items covered by this publication include masts/derricks, substructures, and accessories. This edition is a general revision and includes enhanced recommendations on inspection and personnel qualifications. Pages: 49

3rd Edition | April 2004 | Product Number: G04G03 | Price: $103.00

TUBULAR GOODS

RP 5A3/ISO 13678:2009 ■
Recommended Practice on Thread Compounds for Casing, Tubing, Line Pipe, and Drill Stem
Elements Petroleum and natural gas industries—Evaluation and testing of thread compounds for use with casing, tubing and line pipe

Provides requirements, recommendations and methods for the testing of thread compounds intended for use on threaded casing, tubing, and line pipe connections; and for thread compounds intended for use on rotary shouldered connections. The tests outlined are used to evaluate the critical performance properties and physical and chemical characteristics of thread compounds under laboratory conditions.

This edition of API RP 5A3 is the identical national adoption of ISO 13678, *Petroleum and natural gas industries—Evaluation and testing of thread compounds for use with casing, tubing, line pipe and drill stem elements*. Pages: 47

3rd Edition | November 2009 | Product Number: GX5A303 | Price: $140.00

RP 5A5/ISO 15463:2003
Field Inspection of New Casing, Tubing, and Plain-end Drill Pipe
Petroleum and natural gas industries—Field inspection of new casing, tubing and plain end drill pipe
(includes Errata dated December 2009)

Specifies requirements and gives recommendations for field inspection and testing of oil country tubular goods (OCTG). This International Standard covers the practices and technology commonly used in field inspection; however, certain practices may also be suitable for mill inspections. Covers the qualification of inspection personnel, a description of inspection methods and apparatus calibration and standardization procedures for various inspection methods. The evaluation of imperfections and marking of inspected OCTG are included. Applicable to field inspection of OCTG and is not applicable for use as a basis for acceptance or rejection.

This edition of API RP 5A5 is the identical national adoption of ISO 15463, *Petroleum and natural gas industries—Field inspection of new casing, tubing and plain end drill pipe.* Pages: 118

7th Edition | June 2005 | Product Number: GX5A507 | Price: $152.00

Spec 5B ◆
Specification for Threading, Gauging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads

Covers dimensions and marking requirements for API Master thread gauges. Additional product threads and thread gauges as well as instruments and methods for the inspection of threads for line pipe, round thread casing, buttress casing, and extreme-line casing connections are included. It is applicable when so stipulated in the API standard governing the product. The inspection procedures for measurements of taper, lead, height, and angle of thread are applicable to threads having 11 1/2 or less turns per in. (11 1/2 or less turns per 25.4 mm). All thread dimensions shown without tolerances are related to the basis for connection design and are not subject to measurement to determine acceptance or rejection of product. Pages: 125

15th Edition | April 2008 | Effective Date: October 1, 2008
Product Number: G05B15 | Price: $114.00

RP 5B1
Gauging and Inspection of Casing, tubing and Line Pipe Threads
(includes Addendum 1 dated September 2004)

Covers threading, gauging, gauging practice, and inspection of threads for casing, tubing, and line pipe made under Specifications 5CT, 5DP, and 5L. Also covers gauge specifications and certification for casing, tubing, and line pipe gauges. Pages: 48

5th Edition | August 1999 | Product Number: G05B15 | Price: $137.00

RP 5C1
Recommended Practice for Care and Use of Casing and Tubing

Covers use, transportation, storage, handling, and reconditioning of casing and tubing. Pages: 31

18th Edition | May 1999 | Reaffirmed: August 1, 2006
Product Number: G05C18 | Price: $111.00

TR 5C3/ISO 10400:2007
Technical Report on Equations and Calculations for Casing, Tubing, and Line Pipe used as Casing or Tubing; and Performance Properties Tables for Casing and Tubing
Petroleum and natural gas industries—Formulae and calculations for casing, tubing, drill pipe and line pipe properties

Illustrates the equations and templates necessary to calculate the various pipe properties given in International Standards, including:

- pipe performance properties, such as axial strength, internal pressure resistance and collapse resistance;
- minimum physical properties;
- product assembly force (torque);
- product test pressures;
- critical product dimensions related to testing criteria;
- critical dimensions of testing equipment; and
- critical dimensions of test samples.

This edition of API TR 5C3 is the identical national adoption of ISO 10400, *Petroleum and natural gas industries—Formulae and calculations for casing, tubing, drill pipe and line pipe properties.*

This edition of API TR 5C3 supersedes Bulletins 5C2 and 5C3. Pages: 378

1st Edition | December 2008 | Product Number: G5C301 | Price: $200.00

RP 5C5/ISO 13679:2002
Recommended Practice on Procedures for Testing Casing and Tubing Connections
Petroleum and natural gas industries—Testing procedures for casing and tubing connections

Establishes minimum design verification testing procedures and acceptance criteria for casing and tubing connections for the oil and natural gas industries. These physical tests are part of a design verification process and provide objective evidence that the connection conforms to the manufacturer's claimed test load envelope and limit loads.

This edition of API RP 5C5 is the identical national adoption of ISO 13679, *Petroleum and natural gas industries—Testing procedures for casing and tubing connections.* Pages: 139

3rd Edition | July 2003 | Product Number: GX5C503 | Price: $158.00

RP 5C6
Welding Connections to Pipe

Created to provide a standard industry practice for the shop or field welding of connectors to pipe. The technical content provides requirements for welding procedure qualification, welder performance qualification, materials, testing, production welding and inspection. Additionally, suggestions for ordering are included. Pages: 7

2nd Edition | March 2006 | Product Number: G05C62 | Price: $83.00

RP 5C7
Recommended Practice for Coiled Tubing Operations in Oil and Gas Well Services

Provided to meet the need for design and operating recommendations covering the coiled tubing industry. Pages: 70

1st Edition | December 1996 | Reaffirmed: December 1, 2007
Product Number: G05C71 | Price: $128.00

Spec 5CRA/ISO 13680:2008 ◆■
Specification for Corrosion Resistant Alloy Seamless Tubes for Use as Casing, Tubing and Coupling Stock

International Standard specifies the technical delivery conditions for corrosion-resistant alloy seamless tubulars for casing, tubing and coupling stock for two product specification levels.

This edition of API Spec 5CRA is the modified national adoption of ISO 13680, *Petroleum, and natural gas industries-Corrosion-resistant alloy seamless tubes for use as casing, tubing and coupling stock-Technical delivery conditions*. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 87

1st Edition | February 2010 | Effective Date: August 1, 2010
Product Number: GG5CRA01 | Price: $150.00

Spec 5CT/ISO 11960:2004 ◆
Specification for Casing and Tubing
Petroleum and natural gas industries—Steel pipes for use as casing or tubing for wells
(includes Errata dated April 2006)

Specifies the technical delivery conditions for steel pipes (casing, tubing, plain end casing liners and pup-joints) and accessories. This standard is applicable to the following connections in accordance with API Spec 5B:

- short round thread casing (STC);
- long round thread casing (LC);
- buttress thread casing (BC);
- extreme-line casing (XC);
- non-upset tubing (NU);
- external upset tubing (EU);
- integral joint tubing (IJ).

This edition of API Spec 5CT is the modified national adoption of ISO 11960, *Petroleum and natural gas industries—Steel pipes for use as casing or tubing for wells.* This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 291

8th Edition | July 2005 | Effective Date: January 1, 2006
Product Number: GX5CT08 | Price: $206.00

Spec 5DP/ISO 11961:2008 ◆■
Specification for Drill Pipe
Petroleum and natural gas industries—Steel drill pipe

Specifies the technical delivery conditions for steel drill-pipes with upset pipe-body ends and weld-on tool joints for use in drilling and production operations in petroleum and natural gas industries for three product specification levels (PSL-1, PSL-2 and PSL-3).

This International Standard covers the following grades of drill-pipe:

- grade E drill-pipe;
- high-strength grades of drill-pipe, grades X, G and S.

This International Standard can also be used for drill-pipe with tool joints not specified by ISO or API standards. This International Standard is based on API Spec 5D and API Spec 7.

This edition of API Spec 5DP is the identical national adoption of ISO 11961, *Petroleum, petrochemical and natural gas industries—Steel drill pipe*. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 112

1st Edition | August 2009 | Effective Date: August 1, 2010
Product Number: GX5DP01 | Price: $175.00

Spec 5L/ISO 3183:2007 ◆
Specification for Line Pipe
Petroleum and natural gas industries—Steel pipe for pipeline transportation systems
(includes Errata 1 dated January 2009 and Addendum 1 dated February 2009)

Specifies requirements for the manufacture of two product specification levels (PSL 1 and PSL 2) of seamless and welded steel pipes for use in pipeline transportation systems in the petroleum and natural gas industries.

This edition of API Spec 5L is the modified national adoption of ISO 3183, *Petroleum and natural gas industries—Steel pipe for pipeline transportation systems.* This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 154

44th Edition | October 2007 | Effective Date: October 1, 2008
Product Number: G05L44 | Price: $245.00

RP 5L1 ■
Recommended Practice for Railroad Transportation of Line Pipe

The recommendations provided herein apply to the transportation on railcars of API Spec 5L steel line pipe in sizes 2-3/8 and larger in lengths longer than single random. These recommendations cover coated or uncoated pipe, but they do not encompass loading practices designed to protect pipe coating from damage. Pages: 5

7th Edition | September 2009 | Product Number: G5L107 | Price: $57.00

RP 5L2
Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service

Provides for the internal coating of line pipe used for non-corrosive natural gas service. It is limited to the application of internal coatings on new pipe prior to installation. Pages: 21

4th Edition | July 2002 | Reaffirmed: December 1, 2007
Product Number: G5L204 | Price: $80.00

RP 5L3
Recommended Practice for Conducting Drop-Weight Tear Tests on Line Pipe

Describes procedures for a recommended method for conducting drop-weight tear tests to measure the fracture appearance or fracture ductility of line pipe as referenced in API Spec 5L. Pages: 9

3rd Edition | January 1996 | Reaffirmed: October 22, 2008
Product Number: G05L33 | Price: $80.00

RP 5L7
Recommended Practice for Unprimed Internal Fusion Bonded Epoxy Coating of Line Pipe

Provides recommendations for materials, application, testing and inspection of internal fusion bonded epoxy coatings on line pipe. Pages: 25

2nd Edition | June 1988 | Reaffirmed: December 1, 2004
Product Number: G02906 | Price: $86.00

RP 5L8
Field Inspection of New Line Pipe

Covers the qualification of inspection personnel, a description of inspection methods, and apparatus calibration and standardization procedures for various inspection methods. The evaluation of imperfections and marking of inspected new line pipe are included. Also included are recommended procedures for field inspection and testing of new plain-end line pipe. This document was prepared specifically to address the practices and technology used in field inspection of line pipe, and certain parts are not suitable or appropriate for mill inspections. Pages: 39

2nd Edition | December 1996 | Reaffirmed: September 1, 2003
Product Number: G05L82 | Price: $121.00

Spec 5L9 ◆
Recommended Practice for External Fusion Bonded Epoxy Coating of Line Pipe

Provides standards for pipe suitable for use in conveying gas, water, and oil in both the oil and natural gas industries. Covers seamless and welded steel line pipe, including standard-weight and extra-strong threaded line pipe; and standard-weight plain-end, regular-weight plain-end, special plain-end, extra-strong plain-end, and double-extra-strong plain-end pipe; as well as bell and spigot and through-flowing (TFL) pipe. Pages: 35

1st Edition | December 2001 | Reaffirmed: December 1, 2004
Product Number: G5L901 | Price: $76.00

Spec 5LC ◆
Specification for CRA Line Pipe

Covers seamless, centrifugal cast and welded corrosion resistant alloy line pipe. Austenitic Stainless, and Martensitic Stainless, Duplex Stainless and Ni Base Alloys. Includes standard weight, regular weight, special, extra strong, and double extra strong plain end line pipe. Processes of manufacturer, chemical and physical requirements and methods of test. Metric units in this specification are shown in italic type in parentheses in the text and in many tables. Pages: 72

3rd Edition | July 1998 | Effective Date: December 31, 1998
Reaffirmed: August 1, 2006 | Product Number: G05LC3 | Price: $152.00

Spec 5LCP ◆
Specification on Coiled Line Pipe
(includes Errata dated July 2007)

Provides standards for pipe suitable for use in conveying gas, water, and oil in both the oil and natural gas industries. Covers welded steel continuously milled coiled line pipe in the size range 0.5 in. (12.7 mm) to 6.625 in. (168.3 mm). Pipe that is pipe-to-pipe welded outside the confines of the manufacturing plant is not included within this document. Pages: 42

2nd Edition | October 2006 | Product Number: G5LCP2 | Price: $141.00

Spec 5LD ◆
CRA Clad or Lined Steel Pipe

Covers seamless, centrifugal cast, and welded clad steel line pipe, and lined steel pipe with improved corrosion-resistant properties. The clad and lined steel line pipe specified in this document shall be composed of a base metal outside and CRA layer inside the pipe. The base material shall conform to API Spec 5L, *Specification for Line Pipe*, except as modified in the 5LC document. Provides standards for pipe with improved corrosion resistance suitable for use in conveying gas, water, and oil in both the oil and natural gas industries. Pages: 36

3rd Edition | March 2009 | Effective Date: September 1, 2009
Product Number: G05LD3 | Price: $125.00

RP 5LW ■
Recommended Practice for Transportation of Line Pipe on Barges and Marine Vessels

Applies to the transportation of API Spec 5L steel line pipe by ship or barge. Covers both inland and marine waterways except in cases where the specific requirement of a paragraph references only marine or only inland-waterway transport. Pages: 5

3rd Edition | September 2009 | Product Number: G5LW03 | Price: $57.00

RP 5SI
Recommended Practice for Purchaser Representative Surveillance and/or Inspection at the Supplier

Establishes a set of general guidelines addressing the protocol between purchasers, suppliers and the purchaser representative for surveillance and/or inspection by the purchaser representative. It is a general document for use at the request of the purchaser of API products, and is intended to provide only general guidance to the industry. Addresses the relationship and responsibility of the purchaser, suppliers, and purchaser representatives regarding surveillance and/or inspection of products from placement of the order or the pre-production meeting, as appropriate, through the point of title transfer from suppliers to purchasers. Pages: 7

1st Edition | January 2006 | Product Number: G5SI01 | Price: $55.00

Std 5T1
Standard on Imperfection Terminology
(includes Addendum 1 dated September 2003)

Provides definitions in English, French, German, Italian, Japanese, and Spanish for a number of defects which commonly occur in steel pipe. Pages: 44

10th Edition | September 2003 | Product Number: G05T10 | Price: $111.00

TR 5TRSR22
Technical Report in SR22 Supplementary Requirements for Enhanced Leak Resistance LTC

Covers the supplemental requirements for Enhanced Leak Resistance LTC (SC22) connections and the changes in API Spec 5CT, API Std 5B, API 5B1, and API RP 5C1 needed to produce and inspect these connections. By agreement between the purchaser and manufacturer, the supplemental requirements for SR22 shall apply to connections manufactured in accordance with API Spec 5CT. Pages: 24

1st Edition | June 2002 | Product Number: GSR221 | Price: $85.00

RP 5UE
Recommended Practice for Ultrasonic Evaluation of Pipe Imperfections
(includes Addendum 1 dated April 2009)

Describes procedures which may be used to "prove-up" the depth or size of imperfections. Included in this practice are the recommended procedures for ultrasonic prove-up inspection of new pipe using the Amplitude Comparison Technique and the Amplitude-Distance Differential Technique for evaluation of:

- surface breaking imperfections in the body of pipe; and
- surface breaking and subsurface imperfections in the weld area of electric resistance, electric induction or laser welded pipe; and
- surface breaking and subsurface imperfections in the weld area of arc welded pipe. Pages: 22

2nd Edition | June 2005 | Product Number: G5UE02 | Price: $76.00

VALVES AND WELLHEAD EQUIPMENT

Spec 6A ◆
Specification for Wellhead and Christmas Tree Equipment
(includes Errata 3 dated June 2006, Errata 4 dated August 2007, Addendum 1 dated February 2008, Addendum 2 dated December 2008, Addendum 3 dated December 2008, Addendum 4 dated December 2008, Errata 5 dated May 2009)

Specifies requirements and gives recommendations for the performance, dimensional and functional interchangeability, design, materials, testing, inspection, welding, marking, handling, storing, shipment, purchasing, repair and remanufacture of wellhead and christmas tree equipment for use in the petroleum and natural gas industries. This Standard does not apply to field use, field testing or field repair of wellhead and christmas tree equipment. This standard is applicable to the following specific equipment: wellhead equipment (casing head housings, casing head spools, tubing head spools, cross-over spools, multi-stage head housings and spools); connectors and fittings (cross-over connectors, tubing head adapters, top connectors, tees and crosses, fluid-sampling devices, adapter and spacer spools); casing and tubing hangers (mandrel hangers, slip hangers); valves and chokes (single valves, multiple valves, actuated valves, valves prepared for actuators, check valves, chokes, surface and underwater safety valves and actuators, back-pressure valves); loose connectors (weld neck connectors, blind connectors, threaded connectors, adapter and spacer connectors, bullplugs, valve-

removal plugs); and other equipment (actuators, hubs, pressure boundary penetrations, ring gaskets, running and testing tools, wear bushings). This Standard defines service conditions, in terms of pressure, temperature and material class for the well-bore constituents, and operating conditions. This Standard establishes requirements for five product specification levels (PSL). These five PSL designations define different levels of technical quality requirements.

This edition of API Spec 6A is the modified national adoption of ISO 10423:2003. An informative annex is included covering the requirements of the API Monogram Program for equipment covered in the specification. Pages: 412

19th Edition | July 2004 | Effective Date: February 1, 2005
Product Number: GX06A19 | Price: $252.00

Std 6A718 ■
Nickel Base Alloy 718 (UNS N07718) for Oil and Gas Drilling and Production Equipment

Provides requirements for Nickel Base Alloy 718 (UNS N07718) that are intended to supplement the existing requirements of API Spec 6A and ISO 10423. These additional requirements include detailed process control requirements and detailed testing requirements. The purpose of these additional requirements is to ensure that the Nickel Base Alloy 718 used in the manufacture of API Spec 6A or ISO 10423 pressure-containing and pressure-controlling components is not embrittled by the presence of an excessive level of deleterious phases. This standard is intended to apply to pressure containing and pressure controlling components covered by API Spec 6A and ISO 10423, but is not invoked by API Spec 6A and ISO 10423. This standard is applicable when invoked by the equipment manufacturer or the equipment purchaser. Pages: 18

2nd Edition | December 2009 | Product Number: G6A7182 | Price: $85.00

TR 6AF
Technical Report on Capabilities of API Flanges Under Combinations of Load

Presents the results of analysis work done in to establish the load capacity of all flanges give in the April 1986 editions of API 6A and API 6AB. A total of 69 different geometries were analyzed initially. The various loads considered were bolt makeup (preload), internal pressure, tension, and bending moment. All flanges were analyzed with an axisymmetric finite model for each of the four load cases. A post-processor program was written to calculate the maximum moment capacity for various levels of pressure and tension, based on linear superposition of results. Three different criteria were used to establish the maximum moment:

- ASME Section VIII, Division 2 allowable stress categories for the flange with the basic membrane stress allowable established by API;
- allowable bolt stresses as established by API; and
- loss of preload on the ring joint.

The results of this post-processing are presented in plots of pressure vs. allowable moment for various tension levels. Limitations to this work include:

- the effects of transverse shear or torsion were not considered in the analysis;
- dynamic, fatigue or fretting phenomena were not considered in these results; and
- thermal stresses or elevated temperature effects were not considered.

The charts are intended to be used only as general guidelines for design. These charts are not intended to replace a critical evaluation of any particular connection in an application where the charts show the flange to be marginal. Pages: 79

3rd Edition | September 2008 | Product Number: G6AF03 | Price: $145.00

TR 6AF1
Technical Report on Temperature Derating of API Flanges Under Combination of Loading

Continuation to the report on the capabilities of flanges under combined loadings (PRAC 86-21) which resulted in the publication of API Bulletin 6AF. Included in this technical report is an in-depth look into the effect of elevated temperatures of API flanges. The results in this report are analytical and assume a temperature gradient across the flange as stated in this report. Pages: 256

2nd Edition | November 1998 | Product Number: G06AF1 | Price: $152.00

TR 6AF2
Technical Report on Capabilities of API Integral Flanges Under Combination of Loading—Phase II

This technical report indicates increased load carrying capacity for several flanges based on separate stress limiting criteria. These stress limiting charts were not provided separately in the original work in API Bull 6AF, which combined them with leakage criteria. The three-dimensional model analyses of this study provide verification that exisymmetric finite elements results of flanges, as used in Bull 6AF, are conservative. Additionally, this study determined a few flanges to have less loading capacity than originally defined in API Spec 6A for makeup loading, and thus have been reduced to meet design requirements. Pages: 119

3rd Edition | September 2008 | Product Number: G6AF23 | Price: $174.00

API 6AM
Technical Report on Material Toughness

This technical report includes CVN toughness requirement that can be used as a quality assurance measure in API Spec 6A equipment to screen materials with poor notch toughness. Pages: 12

2nd Edition | September 1995 | Product Number: G06AM2 | Price: $73.00

Spec 6AV1 ◆
Specification for Verification Test of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service
(includes Errata dated December 1996)

The purpose of this specification is to establish requirements to:

- verify the basic performance requirements (PR1) standard service surface safety valves (SSV) and underwater safety valves (USV) valve design;
- verify the basic SSVAJSV actuator design;
- verify the basic PR2 sandy service SSVNSV valve design; and,
- to demonstrate the verification testing covered by this specification that is required to qualify specific valve bore sealing mechanism manufactured under API Spec 6A for PR2 sandy service safety valves.

Included are minimum acceptable standards for verification testing of SSVs AJSVs for two performance requirement levels. To qualify, a SSVNSV valve must pass the verification test specified in Section 4. The two performance requirement levels are as follows.

- PRI Standard Service—This performance requirement level of SSV/USV is intended for use on oil or gas wells that do not exhibit the detrimental effects of sand erosion or fouling; and.
- PR2 Sandy Service—This performance level of SSVNSV is intended for use on oil or gas wells where a substance such as sand could be expected to cause a SSVAJSV valve failure.

This valve must also meet the requirements of performance level PRI Standard Service. Pages: 14

1st Edition | February 1996 | Reaffirmed: April 30, 2008
Product Number: G06AV1 | Price: $73.00

Spec 6D/ISO 14313:2007 ◆
Specification for Pipeline Valves
Petroleum and natural gas industries—Pipeline transportation systems—Pipeline valves

Specifies requirements and provides recommendations for the design, manufacturing, testing and documentation of ball, check, gate and plug valves for application in pipeline systems meeting ISO 13623 or similar requirements for the petroleum and natural gas industries. This Specification is not applicable to subsea pipeline valves, as they are covered by a separate Specification (API Spec 6DSS). This Specification is not for application to valves for pressure ratings exceeding PN 420 (Class 2 500).

This edition of API Specification 6D is the identical national adoption of ISO 14313:2007, *Petroleum and natural gas industries—Pipeline transportation systems—Pipeline valves*. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 79

23rd Edition | March 2008 | Effective Date: October 1, 2008
Product Number: GX6D23 | Price: $127.00

RP 6DR
Repair and Remanufacture of Pipeline Valves

Provides guidelines for the repair and remanufacture of steel ball, check, gate, and plug valves normally used in pipeline applications, as defined by API Spec 6D. This RP covers repair or remanufacturing of end user's (owner's) valves for continued service in the owner's production applications. Repaired or remanufactured valves may not meet API and/or the OEM standard requirements for new valves. The owner is responsible for the correct application of valves repaired or remanufactured per this document. It does not cover repair or remanufacture of used or surplus valves intended for resale. Furthermore, field repair is outside the scope of this document. Pages: 9

1st Edition | February 2006 | Product Number: G06DR1 | Price: $73.00

Spec 6DSS/ISO 14723:2009 ◆■
Specification for Subsea Pipeline Valves
Petroleum and natural gas industries—Pipeline transportation systems—Subsea pipeline valves

Specifies requirements and gives recommendations for the design, manufacturing, testing and documentation of ball, check, gate and plug valves for subsea application in offshore pipeline systems meeting the requirements of ISO 13623 for the petroleum and natural gas industries. This Standard is not applicable to valves for pressure ratings exceeding PN 420 (Class 2500).

This edition of API Spec 6DSS is the identical national adoption of ISO 14723, *Petroleum and natural gas industries—Pipeline transportation systems—Subsea pipeline valves*. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 72

2nd Edition | December 2009 | Effective Date: June 1, 2010
Product Number: GX6DSS2 | Price: $160.00

TR 6F1
Technical Report on Performance of API and ANSI End Connections in a Fire Test According to API Specification 6FA

The summarization of results of four projects to test the performance of API and ANSI end connections in a fire test according to API Specification 6FA. The appendixes present the analytical procedures used to generate performance prediction. Pages: 29

3rd Edition | April 1999 | Product Number: G06F13 | Price: $111.00

TR 6F2
Technical Report on Fire Resistance Improvements for API Flanges

This technical report establishes recommended methods for improving the performance of standard API flanges when subjected to the adverse effects of external high temperatures induced by exposure to fires. This publication does not cover fire prevention, suppression, or firefighting practices. Pages: 19

3rd Edition | April 1999 | Product Number: G06F23 | Price: $105.00

Spec 6FA
Fire Test for Valves
(includes Errata 2, December 2008)

It is the purpose of this document to establish, the requirements for testing and evaluating the pressure-containing performance of API Specs 6A and 6D valves when exposed to fire. The performance requirements of this document are intended to establish standard limits of acceptability regardless of size or pressure rating. This document establishes acceptable levels for leakage through the test valve and also external leakage after exposure to a fire for a 30 minute time period. The burn period has been established on the basis that it represents the maximum time required to extinguish most fires. Fires of greater duration are considered to be of a major magnitude with consequences greater than those anticipated in this test. This standard covers the requirements for testing and evaluating the performance of API Specs 6A and 6D valves when exposed to specifically defined fire conditions. However, this standard is not intended to cover check valves or end connections. Pages: 7

3rd Edition | April 1999 | Reaffirmed: July 1, 2006
Product Number: G06FA3 | Price: $94.00

Spec 6FA *
Fire Test for Valves—Russian

Russian translation of Specification 6FA.

3rd Edition | April 1999 | Product Number: G06FA3R | Price: $99.00

Spec 6FB
Specification for Fire Test for End Connections
(includes Errata 2 December 2008)

This specification was formulated to establish procedures for testing and evaluating the pressure-containing performance of API end connections when exposed to fire. Valves, wellhead seals, or other related equipment, are not included in the scope of this document. The procedures are presented in two parts: Part I represents conditions in an onshore or open offshore location and Part II represents conditions in an offshore platform well bay. Background information on fire-resistance of API end connections is contained in API Bull 6F1. Further background on fire-resistance improvements of API flanges is contained in API Bull 6F2. This specification covers API Spec 6A end connections, which include:

- API Flanged End and Outlet Connections (6B, 6BX, and Segmented);
- API Threaded End and Outlet Connections; and,
- Other End Connections (OECs). Pages: 20

3rd Edition | May 1998 | Effective Date: November 30, 1998
Reaffirmed: July 10, 2006 | Product Number: G06FB3 | Price: $105.00

Spec 6FC ■
Specification for Fire Test for Valves With Automatic Backseats

Establishes the requirements for testing and evaluating the pressure-containing performance of API Specs 6A and 6D automatic backseating valves when exposed to fire. The performance requirements of this document are intended to establish standard limits of acceptability regardless of size or pressure rating. This document establishes acceptable levels for leakage through the test valve and also external leakage after exposure to a fire for a 30-minute time period, both before and after reworking the stuffing box. The

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burn period has been established on the basis that it represents the maximum time required to extinguish most fires. Fires of greater duration are considered to be of a major magnitude with consequences greater than those anticipated in this test. Pages: 9

4th Edition | March 2009 | Product Number: G06FC3 | Price: $94.00

Spec 6FD
Specification for Fire Test for Check Valves

Establishes the requirements for testing and evaluating the pressure containing performance of API Specs 6A and 6D check valves when exposed to fire. The performance requirements of this document are intended to establish standard limits of acceptability regardless of size or pressure rating. This document establishes acceptable levels of leakage through the test valve and also external leakage after exposure to a fire for a 30-minute time period. The burn period has been established on the basis that it represents the maximum time required to extinguish most fires. Fires of greater duration are considered to be of a major magnitude with consequences greater than those anticipated in this test. Pages: 9

1st Edition | February 1995 | Reaffirmed: September 1, 2008
Product Number: G06FD1 | Price: $86.00

Spec 6FD *
Specification for Fire Test for Check Valves-Russian

Russian translation of Specification 6FD.

1st Edition | February 1999 | Product Number: G06FD1R | Price: $90.00

Spec 6H ◆
Specification on End Closures, Connectors, and Swivels

This specification covers the following:

- pipeline closures;
- connectors;
- couplings;
- misalignment devices (swivels); and
- split mechanical fittings.

This specification does not apply to welded, flanged, or threaded fittings that are specified in other recognized standards. Pages: 21

2nd Edition | May 1998 | Effective Date: November 1, 1998
Reaffirmed: July 10, 2006 | Product Number: G06H02 | Price: $94.00

RP 6HT
Heat Treatment and Testing of Large Cross Section and Critical Section Components

Supplements API equipment specifications for large cross section and critical components. The recommend practice described herein suggests the requirements for batch-type bath quench and water spray quench-type heat treating practices. Pages: 7

1st Edition | February 2005 | Product Number: G6HT01 | Price: $73.00

Bull 6J
Testing of Oilfield Elastomers (A Tutorial)
(ANSI/API Bull 6J-1992)

A tutorial for the evaluation of elastomer test samples of actual elastomeric seal members intended for use in the oil and gas industry. It is also a review of the testing criteria, environments, evaluation procedures, guidelines for comparisons, and effects of other considerations on the evaluation of elastomeric seal materials and members. Pages: 15

2nd Edition | May 1998 | Product Number: G03230 | Price: $76.00

TR 6J1
Elastomer Life Estimation Testing Procedures

The proposed procedure discussed in this publication outlines a technique based on the Arrhenius principle of chemical reaction rates, which permits the life of an elastomeric material to be estimated when exposed to a severe service environment. This is a companion document to API Bull 6J, 2nd Edition. Pages: 14

1st Edition | August 2000 | Product Number: G06J11 | Price: $76.00

Spec 11IW ◆
Specification for Independent Wellhead Equipment

Formulated to provide for the availability of safe, dimensionally and functionally interchangeable independent wellhead equipment. The technical content provides requirements for performance, design, materials, testing, inspection, welding, marking, handling, storing and shipping. This specification covers the independent wellhead equipment utilized for pressure control systems for the production of oil and gas. Specific equipment covered by this specification is listed as follows:

- independent wellheads;
- top connectors;
- tubing and casing slip hangers;
- tubing and cashing mandrel hangers;
- packoffs;
- belled nipples;
- connector flanges; and,
- stripper adapters. Pages: 21

1st Edition | June 2000 | Reaffirmed: March 31, 2008
Product Number: G11IW1 | Price: $80.00

RP 14H
Recommended Practice for Installation, Maintenance and Repair of Surface Safety Valves and Underwater Safety Valves Offshore

One of the means of assuring positive wellstream shutoff is the use of the wellhead surface safety valve (SSV) or underwater safety valve (USV). It is imperative that the SSV/USV be mechanically reliable. It should therefore be operated, tested and maintained in a manner to assure continuously reliable performance. The purpose of this recommended practice is to provide guidance for inspecting, installing, operating, maintaining, and onsite repairing SSVs/USVs manufactured according to API Spec 6A (17th Edition or later), Clause 10.20 or API Spec 14D (withdrawn). Included are procedures for testing SSVs/USVs. This document covers guidelines for inspecting, installing, maintaining, onsite repairing, and operating SSVs/USVs. Nothing in this document is to be construed as a fixed rule without regard to sound engineering judgment nor is it intended to override applicable federal, state or local laws. Pages: 15

5th Edition | August 2007 | Product Number: G14H05 | Price: $115.00

RP 14H *
Recommended Practice for Installation, Maintenance and Repair of Surface Safety Valves and Underwater Safety Valves Offshore—Russian

Russian translation of Recommended Practice 14H.

5th Edition | August 2007 | Product Number: G14H05R | Price: $121.00

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VALVES AND WELLHEAD EQUIPMENT—TRAINING COURSES

Overview of API Spec 6A
www.api-u.org/6A.html

API 6A has been revised in many significant ways. New products have been added to the scope; requirements have been changed. The specification is now primarily in the ISO metric system with traditional dimensions in parentheses or annexes. Additionally, the specification addresses the rules of the new NACE Standard, MR0175-2003.

Overview of API Specification 6D
www.api-u.org/6D.html

Each section of the current edition of Specification 6D is covered in detail, followed by a section-by-section coverage of API 6DSS highlighting the common requirements and the differences between the two specifications. The relationship of these specifications and ASME B16.34, Steel Valves, and API Specification 6A/ISO 10423, Wellhead and Christmas Tree Equipment, will be clarified.

DRILLING EQUIPMENT

Spec 7-1/ISO 10424-1:2004 ◆
Specification for Rotary Drill Stem Elements
Petroleum and natural gas industries—Rotary drilling equipment—Part 1: Rotary Drill stem elements (includes Addendum 1 dated March 2007 and Addendum 2 dated August 2009)

The following products are covered by this standard:

- upper and lower kelly valves,
- square and hexagon kellys,
- drill-stem subs,
- drill collars,
- drilling and coring bits.

Rotary shouldered connections and gauging for drill stem elements are covered in API Spec 7-2.

This edition of API Spec 7-1 is the modified national adoption of ISO 10424-1, *Petroleum and natural gas industries—Rotary drilling equipment—Part 1: Rotary Drill stem elements*. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 87

1st Edition | February 2006 | Effective Date: September 1, 2006
Product Number: GX7101 | Price: $157.00

Spec 7-2/ISO 10424-2:2007 ◆
Specification for Threading and Gauging of Rotary Shouldered Thread Connections
Petroleum and natural gas industries—Rotary drilling equipment—Part 2: Threading and gauging of rotary shouldered threaded connections

Specifies requirements on rotary shouldered connections for use in petroleum and natural gas industries, including dimensional requirements on threads and thread gauges, stipulations on gauging practice, gauge specifications, as well as instruments and methods for inspection of thread connections. These connections are intended primarily for use in drill-string components. Other supplementary specifications can be agreed between interested parties for special tolerance requirements, qualification, testing, inspection and finishing. Specification 7-2 is applicable to the following preferred rotary shouldered connection designs:

- number (NC) style;
- regular (REG) style;
- full hole (FH) style.

These are traceable to an internationally supported system of gauges and calibration.

This edition of API Spec 7-2 is the identical (with a few editorial changes) national adoption of ISO 10424-2, *Petroleum and natural gas industries—Rotary drilling equipment—Part 2: Threading and gauging of rotary shouldered thread connections*. Spec 7-2 replaces threading and gauging previously covered by API Spec 7. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 102

1st Edition | June 2008 | Effective Date: December 1, 2008
Product Number: GX70201 | Price: $167.00

RP 7A1
Recommended Practice for Testing of Thread Compound for Rotary Shouldered Connections
(ANSI/API RP 7A1-1992)

Provides recommendations for testing the frictional performance of thread compounds for rotary shouldered connections. Pages: 13

1st Edition | November 1992 | Reaffirmed: March 1, 2005
Product Number: G03305 | Price: $62.00

Spec 7F ◆
Oil Field Chain and Sprockets

Covers the manufacture of the components for, and the assembly and packaging of, single and multiple strand, number 40 through 240, standard and heavy series roller chains for oil field applications, including chain designation, chain length tolerance, tensile strength specifications, pin and bushing press-out specifications, and dynamic test requirements. Spec 7F also includes recommendations for installation, lubrication, and maintenance of oil field chain drives and a basic description of roller chain sprockets. Pages: 21

7th Edition | January 2003 | Effective Date: June 1, 2003
Product Number: G07F07 | Price: $112.00

RP 7G
Recommended Practice for Drill Stem Design and Operating Limits
(includes Errata dated May 2000, Addendum 1 dated November 2003 and Addendum 2 dated August 2009)

Covers recommendations for the design and selection of drill string members and includes considerations of hole angle control, drilling fluids, weight, and rotary speed. Tables and graphs are included that present dimensional, mechanical, and performance properties of new and used drill pipe; new tool joints used with new and used drill pipe; drill collars; and kellys. Recommended standards for inspection of used drill pipe, used tubing work strings, and used tool joints are included. Pages: 154

16th Edition | August 1998 | Effective Date: December 1, 1998
Product Number: G07G6A | Price: $188.00

RP 7G-2/ISO 10407-2:2008 ■
Recommended Practice for Drill Stem Element Inspection
Petroleum and natural gas industries—Rotary drilling equipment—Part 2: Inspection and classification of drill stem elements (includes Errata dated October 2009)

Specifies the requirements for each level of inspection and procedures for the inspection and testing of used drill stem elements. This document has been prepared to address the practices and technology commonly used in inspection. This document also specifies the qualification of inspection personnel, a description of inspection methods and apparatus calibration and standardization procedures for various inspection methods. The evaluation of imperfections and the marking of inspected drill stem elements is included.

This edition of API RP 7G-2 is the identical national adoption of ISO 10407-2, *Petroleum and natural gas industries—Rotary drilling equipment—Part 2: Inspection and classification of used drill stem elements*. Pages: 213

1st Edition | August 2009 | Product Number: GX7G201 | Price: $135.00

RP 7HU1 ■
Safe Use of 2-Inch Hammer Unions for Oilfield Applications

Sets forth procedural recommendations as well as an engineering solution to the mismatching of a female 2-in. Figure 402, a female 2-in. Figure 602, or a female 2-in. Figure 1002 hammer union component (sub) with a male 2-in. Figure 1502 hammer union component (wing nut) as described in 3.2. The procedural recommendations described in this RP should be implemented to reduce further incidents. The engineering solution, which makes impossible the mating of female 2-in. Figure 402, 2-in. Figure 602 and/or 2-in. Figure 1002 subs with the wing nut of the 2-in. Figure 1502 hammer union, applies to the manufacture of new hammer union components and should not be applied in the modification of existing hammer union components due to unknown factors caused by field wear. Pages: 12

1st Edition | May 2009 | Product Number: H7HU11 | Price: $35.00

Spec 7K/ISO 14693:2003 ◆
Specification for Drilling and Well Servicing Equipment

Petroleum and natural gas industries—Drilling and well-servicing equipment
(includes Addendum 1 dated February 2006 and Addendum 2 dated March 2006)

Provides general principles and specifies requirements for design, manufacture and testing of new drilling and well-servicing equipment and of replacement primary load-carrying components manufactured subsequent to the publication of this International Standard. This Standard is applicable to the following equipment:

- rotary tables;
- rotary bushings;
- rotary slips;
- high pressure mud and cement hose;
- piston mud-pump components;
- drawworks components;
- spiders not capable of use as elevators;
- manual tongs;
- safety clamps not used as hoisting devices;
- power tongs, including spinning wrenches;
- BOP handling equipment.

Annex A gives a number of standardized supplementary requirements which apply only when specified.

This edition of API Spec 7K is the modified national adoption of ISO 14693, *Petroleum and natural gas industries—Drilling and well-servicing equipment.* This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 82

4th Edition | June 2005 | Effective Date: December 1, 2005
Product Number: GX7K04 | Price: $176.00

RP 7L
Inspection, Maintenance, Repair, and Remanufacture of Drilling Equipment

(includes Addendum 1 dated February 2006 and Addendum 2 dated, March 2006)

Provides owners and users of drilling equipment with guidelines for inspection, maintenance, repair, and remanufacture procedures that may be utilized to maintain serviceability of the drilling equipment. Covers the following drilling equipment:

- rotary tables;
- rotary bushings;
- rotary slips;
- rotary hoses;
- slush pump connectors;
- drawworks components;
- spiders not used as elevators;
- manual tongs; and
- safety clamps not used as hoisting devices. Pages: 26

1st Edition | December 1995 | Effective Date: April 1, 1996
Product Number: G07L01 | Price: $105.00

Spec 7NRV ◆
Specification on Non-Return Valves

This standard was formulated to provide the minimum acceptable requirements for Drill String Non-return Valve (NRV) equipment. It covers Drill String Non-return Valves, Non-return Valve Subs, Non-return Valve landing nipples, Non-return Valve Equalizing Heads and all components that establish tolerances and/or clearances which may affect performance or interchangeability of the NRV equipment. Non-return Valve Subs, Non-return Valve landing nipples, Non-return Valve Equalizing Heads and NRVs manufactured by different facilities or manufacturers may be supplied as separate items. Pages: 19

1st Edition | July 2006 | Product Number: G7NRV01 | Price: $67.00

HOISTING TOOLS

Spec 8A ◆
Drilling and Production Hoisting Equipment

(includes Addendum 1 dated May 2001)

Provides a basis for establishing the ratings of main load carrying components of certain hoisting equipment used in drilling and production operations to include the maximum load and bearing load. This specification provides the manufacturer with material and process controls for adequately assuring that manufactured units will meet the established design load ratings. Pages: 26

13th Edition | December 1997 | Effective Date: May 1, 1998
Product Number: G08A13 | Price: $105.00

RP 8B/ISO 13534:2000
Inspection, Maintenance, Repair, and Remanufacture of Hoisting Equipment

Petroleum and natural gas industry—Drilling and production equipment—Inspection, maintenance, repair and remanufacture of hoisting equipment
(includes Addendum 1 dated November 2003 and Addendum 2 dated April 2005)

Provides guidelines and establishes requirements for inspection, maintenance, repair, and remanufacture of items of hoisting equipment used in drilling and product operations to maintain equipment serviceability. This recommended practice covers such items as crown-block sheaves and bearings, drilling hooks, elevator links, rotary swivels, dead-line tie-down/ wireline anchors, and safety clamps.

This edition of RP 8B is the modified national adoption of ISO 13534, *Petroleum and natural gas industry—Drilling and production equipment—Inspection, maintenance, repair and remanufacture of hoisting equipment.* Pages: 13

7th Edition | March 2002 | Product Number: GX08B07 | Price: $80.00

Spec 8C/ISO 13535:2000 ◆
Specification for Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)

Petroleum and natural gas industries—Drilling and production equipment—Hoisting equipment
(includes Addendum 1 dated May 2004 and Addendum 2 dated April 2005)

Provides requirements for the design, manufacture and testing of hoisting equipment suitable for use in drilling and production operations. This specification is applicable to numerous drilling and production hoisting equipment, some of which include: hoisting sheaves, travelling and hook blocks; elevator links, casing elevators, sucker rod elevators, rotary and power swivels, drilling hooks, wireline anchors, drill string motion compensators, and safety clamps.

This edition of Spec 8C is the modified national adoption of ISO 13535:2000, *Petroleum and natural gas industries—Drilling and production equipment—Hoisting equipment*. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 60

4th Edition | February 2003 | Effective Date: July 1, 2003
Product Number: GX08C04 | Price: $125.00

WIRE ROPE

Spec 9A/ISO 10425 ◆
Specification for Wire Rope
Petroleum and natural gas industries—Drilling and production equipment—Specification for wire rope

Steel wire ropes for the petroleum and natural gas industries—Minimum requirements and terms for acceptance Specifies the minimum requirements and terms of acceptance for the manufacture and testing of steel wire ropes not exceeding rope grade 2160 for the petroleum and natural gas industries.

This edition of API Spec 9A is a identical adoption of ISO 10425, *Petroleum and natural gas industries—Drilling and production equipment—Specification for wire rope* and includes the addition of an API Monogram Annex. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 57

25th Edition | February 2004 | Effective Date: August 1, 2004
Product Number: GX9A25 | Price: $95.00

RP 9B
Application, Care, and Use of Wire Rope for Oil Field Service

Covers typical wire rope applications for the oil and gas industry. Typical practices in the application of wire rope to oil field service are indicated in Table 1, which shows the sizes and constructions commonly used. Because of the variety of equipment designs, the selection of other constructions than those shown is justifiable. In oilfield service, wire rope is often referred to as wire line or cable. For the purpose of clarity, these various expressions are incorporated in this recommended practice. Pages: 33

12th Edition | June 2005 | Product Number: G09B12 | Price: $111.00

OIL WELL CEMENTS

Spec 10A/ISO 10426-1:2000 ◆
Specification for Cements and Materials for Well Cementing
Petroleum and natural gas industries—Cements and materials for well cementing—Part 1: Specification
(includes Addendum dated January 2005)

Specifies requirements and gives recommendations for eight classes of well cements, including their chemical and physical requirements and procedures for physical testing. This specification is applicable to well cement Classes A, B, C, D, E and F, which are the products obtained by grinding Portland cement clinker and, if needed, calcium sulfate as an interground additive. Processing additives may be used in the manufacture of cement of these classes. Suitable set-modifying agents may be interground or blended during manufacture of Classes D, E and F. API Spec 10A is also applicable to well cement Classes G and H, which are the products obtained by grinding Portland cement clinker with no additives other than calcium sulfate or water.

This edition of API Spec 10A is an adoption of ISO 10426-1:2000 with editorial changes and includes the addition of an API Monogram Annex. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 46

23rd Edition | April 2002 | Effective Date: October 1, 2002
Product Number: GX10A23 | Price: $128.00

RP 10B-2/ISO 10426-2:2003
Recommended Practice for Testing Well Cements
Petroleum and natural gas industries—Cements and materials for well cementing—Part 2: Testing of well cement
(includes Errata 1 dated June 2006, Errata 2 dated January 2007)
(Supersedes API RP 10B)

Specifies requirements and gives recommendations for the testing of cement slurries and related materials under simulated well conditions.

This edition of API RP 10B-2 is the identical national adoption of ISO 10426-2, *Petroleum and natural gas industries—Cements and materials for well cementing—Part 2: Testing of well cement*. Pages:

1st Edition | July 2005 | Product Number: GX10B201 | Price: $205.00

RP 10B-3/ISO 10426-3:2003
Recommended Practice on Testing of Deepwater Well Cement Formulations
Petroleum and natural gas industries—Cements and materials for well cementing—Part 3: Testing of deepwater cement formulations

Provides procedures for testing well cements and cement blends for use in the petroleum and natural gas industries in a deepwater environment.

This edition of API RP 10B-3 is the identical national adoption of ISO 10426-3, *Petroleum and natural gas industries—Cements and materials for well cementing—Part 3: Testing of deepwater cement formulations*. Pages: 13

1st Edition | July 2004 | Product Number: GG10B31 | Price: $74.00

RP 10B-4/ISO 10426-4:2004
Recommended Practice on Preparation and Testing of Foamed Cement Slurries at Atmospheric Pressure
Petroleum and natural gas industries—Cements and materials for well cementing—Part 4: Preparation and testing of foamed cement slurries at atmospheric pressure

Defines the methods for the generation and testing of foamed cement slurries and their corresponding unfoamed base cement slurries at atmospheric pressure.

This edition of API RP 10B-4 is the identical national adoption of ISO 10426-4, *Petroleum and natural gas industries—Cements and materials for well cementing—Part 4: Preparation and testing of Foamed Cement Slurries at Atmospheric Pressure*. Pages: 13

1st Edition | July 2004 | Product Number: GG10B41 | Price: $74.00

RP 10B-5/ISO 10426-5:2004
Recommended Practice on Determination of Shrinkage and Expansion of Well Cement Formulations at Atmospheric Pressure
Petroleum and natural gas industries—Cements and materials for well cementing—Part 5: Determination of shrinkage and expansion of well cement formulations at atmospheric pressure

Provides the methods for the testing of well cement formulations to determine the dimension changes during the curing process (cement hydration) at atmospheric pressure only. This is a base document, because under real well cementing conditions shrinkage and expansion take place under pressure and different boundary conditions.

This edition of API RP 10B-5 is the identical national adoption of ISO 10426-5, *Formulations at Atmospheric Pressure Petroleum and natural gas industries—Cements and materials for well cementing—Part 5: Determination of shrinkage and expansion of well cement formulations at atmospheric pressure*. Pages: 13

1st Edition | April 2005 | Product Number: GG10B501 | Price: $77.00

Spec 10D/ISO 10427-1:2001 ◆
Specification for Bow-Spring Casing Centralizers
Petroleum and natural gas industries—Bow-spring casing centralizers—Part 1: Specification

Provides minimum performance requirements, test procedures and marking requirements for bow-spring casing centralizers for the petroleum and natural gas industries. The procedures provide verification testing for the manufacturer's design, materials and process specifications, and periodic testing to confirm the consistency of product performance. API Spec 10D is not applicable to rigid or positive centralizers.

This edition of API Spec 10D is the identical national adoption of ISO 10427-1:2001, *Petroleum and natural gas industries—Casing centralizers—Part 1: Bow-spring casing centralizers.* This specification contains the API Monogram Annex as part of the U.S. national adoption. . Pages: 12

6th Edition | March 2002 | Effective Date: September 1, 2002
Reaffirmed: August 1, 2008 | Product Number: GX10D06 | Price: $86.00

RP 10D-2/ISO 10427-2:2004
Recommended Practice for Centralizer Placement and Stop Collar Testing

Petroleum and natural gas industries—Equipment for well cementing—Part 2: Centralizer placement and stop-collar testing

Provides calculations for determining centralizer spacing, based on centralizer performance and desired standoff, in deviated and dogleg holes in wells for the petroleum and natural gas industries. It also provides a procedure for testing stop collars and reporting test results.

This edition of API RP 10D-2 is the identical national adoption of ISO 10427-2, *Petroleum and natural gas industries—Equipment for well cementing—Part 2: Centralizer placement and stop-collar testing*. Pages: 14

1st Edition | August 2004 | Product Number: GG10D21 | Price: $74.00

RP 10F/ISO 10427-3:2003
Recommended Practice for Performance Testing of Cementing Float Equipment

Petroleum and natural gas industries—Equipment for well cementing—Part 3: Performance testing of cementing float equipment
(includes Errata, dated September 2003)

Describes testing practices to evaluate the performance of cementing float equipment for the petroleum and natural gas industries. This recommended practice is applicable to float equipment that will be in contact with water-based fluids used for drilling and cementing wells. It is not applicable to float equipment performance in non-water-based fluids.

This edition of API RP 10F is an identical adoption of ISO 18165:2001, *Petroleum and natural gas industries—Equipment for well cementing—Part 3: Performance testing of cementing float equipment*. Pages: 12

3rd Edition | April 2002 | Reaffirmed: August 1, 2008
Product Number: GX10F03 | Price: $62.00

TR 10TR1
Cement Sheath Evaluation

Provides the current principles and practices regarding the evaluation and repair of primary cementations of casing strings in oil and gas wells. Cement bond logs, compensated logging tools, ultrasonic cement logging tools, and borehole fluid-compensated logging tools are covered. Pages: 124

2nd Edition | September 2008 | Product Number: G10TR12 | Price: $140.00

TR 10TR2
Shrinkage and Expansion in Oilwell Cements

Presents the results of research into shrinkage and expansion of oilwell cements in the wellbore as well as a series of test methods and procedures developed to measure these phenomena. Pages: 57

1st Edition | July 1997 | Reaffirmed: September 1, 2002
Product Number: G10TR2 | Price: $118.00

TR 10TR3
Temperatures for API Cement Operating Thickening Time Tests

Work performed by the 1984-91 API Task Group on Cementing Temperature Schedules to update the temperatures in API well-simulation test schedules found in Recommended Practice 10B are summarized in this report. The Task Group reviewed the largest set of temperature data available to the industry to date, resulting in significant improvements to the temperatures in the well-simulation test schedules. Pages: 97

1st Edition | May 1999 | Reaffirmed: May 1, 2005
Product Number: G10TR3 | Price: $152.00

TR 10TR4
Technical Report on Considerations Regarding Selection of Centralizers for Primary Cementing Operations

The goal of this document is to provide the petroleum industry with information for three types of centralizers, their selection and application, and their advantages and limitations. Pages: 23

1st Edition | May 2008 | Product Number: G10TR40 | Price: $59.00

TR 10TR5
Technical Report on Methods for Testing of Solid and Rigid Centralizers

The purpose of this document is to provide the industry with methods for testing rigid and solid centralizers. Pages: 16

1st Edition | May 2008 | Product Number: G10TR50 | Price: $59.00

PRODUCTION EQUIPMENT

Spec 7B-11C ◆
Specification for Internal-Combustion Reciprocating Engines for Oil-Field Service

Covers internal combustion reciprocating engines for oil-field service, including methods of testing and rating for application to specific oilfield duties. The methods of test stipulated herein are intended to afford the purchaser a uniform basis for comparing similar equipment with respect to capacity, energy requirements, and recommended speed range. This document covers methods for determining maximum brake horsepower and fuel consumption rates of internal-combustion bare engines and power units; provides for the manufacturer's maximum horsepower rating of such equipment for specific service applications; and gives methods for testing and rating of radiator-type cooling units. Pages: 13

9th Edition | November 1994 | Effective Date: May 1, 1995
Reaffirmed: April 2, 2008 | Product Number: G03409 | Price: $81.00

RP 7C-11F
Recommended Practice for Installation, Maintenance, and Operation of Internal-Combustion Engines

This RP for the installation, maintenance, and operation of internal-combustion engines covers three objectives: To present information of a general nature pertaining to their installation and to emphasize installation recommendations for specific types of service, observation of which is often overlooked; To present maintenance check-off lists for daily, weekly, and monthly maintenance of such engines; and, To present trouble-shooting recommendations with which the causes of most common engine troubles can be determined. This publication does not purport to be a detailed instruction manual; and, in cases where additional information is required on a particular piece of equipment, the manufacturer should be consulted. The information presented under installation and maintenance has been classified as: Applicable generally to all types of internal-combustion engines in all types of service; and Particularly applicable to engines in drilling or semiportable plant service. Particularly applicable to engines in oil-well pumping, oil-pump, or similar service where the engines may or may not be under daily observation. Both multiple-cylinder and single- or two-cylinder engines are considered in the latter category. Pages: 17

5th Edition | November 1994 | Reaffirmed: April 2, 2008
Product Number: G03505 | Price: $80.00

Spec 11B/ISO 10428:1993 ◆
Specification for Sucker Rods
Petroleum and natural gas industries—Sucker rods (pony rods, polished rods, couplings and sub-couplings)—Specification

Covers dimensional requirements for metal and fiberglass sucker rods, couplings and subcouplings; also stipulations on gauges, gauging practices, and the use of the API Monogram.

This edition of API Spec 11B is the identical national adoption of ISO 10428, *Petroleum and natural gas industries—Sucker rods (pony rods, polished rods, couplings and sub-couplings)—Specification.* This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 47

26th Edition | January 1998 | Effective Date: July 1, 1998
Product Number: G11B26 | Price: $111.00

Spec 11B/ISO 10428:1993 *
Specification for Sucker Rods—Russian
Petroleum and natural gas industries—Sucker rods (pony rods, polished rods, couplings and sub-couplings)—Specification

The Russian translation of Spec 11B.

26th Edition | January 1998 | Effective Date: July 1, 1998
Product Number: G11B0R | Price: $118.00

RP 11BR
Recommended Practice for the Care and Handling of Sucker Rods

Covers the care and handling of steel sucker rods, including guidelines on selection, allowable stress, proper joint makeup, corrosion control and used rod inspection. Pages: 28

9th Edition | August 2008 | Product Number: G11BR09 | Price: $101.00

Spec 11E ◆
Specification for Pumping Units

Covers designs and ratings of beam-type pumping units for use in the petroleum and natural gas industry. included are all components between the carrier bar and the speed reducer input shaft. This includes the beam pump structure, pumping unit gear reducer and pumping unit chain reducer. Only loads imposed on the structure and/or gear reducer by the polished rod load are considered in this specification. Also included are the requirements for the design and rating of enclosed speed reducers wherein the involute gear tooth designs include helical and herringbone gearing. The specification does not cover chemical properties of materials, installation and maintenance of the equipment, beam type counterbalance units, prime movers and power transmission devices outside the gear reducer, or control systems. Pages: 86

18th Edition | November 2008 | Effective Date: May 1, 2009
Product Number: G11E018 | Price: $160.00

RP 11ER
Recommended Practice for Guarding of Pumping Units

Provides a reference or guide for the design, manufacture, and installation of guards for oil well pumping units. It is based on practices which experience has shown to be functionally safe and practical. This recommended practice is intended to provide safeguards for all persons who are required to work around or on oil well pumping units. Pages: 17

2nd Edition | January 1990 | Reaffirmed: October 23, 2008
Product Number: G05205 | Price: $80.00

RP 11G
Recommended Practice for Installation and Lubrication of Pumping Units

Covers installation of beam-type pumping units and lubrication of pumping-unit reducers. Pages: 8

4th Edition | November 1994 | Reaffirmed: October 23, 2008
Product Number: G11G04 | Price: $80.00

TR 11L
Design Calculations for Sucker Rod Pumping Systems (Conventional Units)

Covers recommendations for design calculations for conventional unit sucker rod pumping systems based on test data submitted to API by Sucker Rod Pumping Research, Inc. The topics include vibration characteristics of sucker-rod strings, physical characteristics of sucker rods and dimensional analysis of sucker-rod pumping systems. The calculations apply to the broad category of average, normal pumping wells fitting the assumed conditions defined therein. Unusual or out-of-the-ordinary conditions will cause deviations from calculated performance. Pages: 24

5th Edition | June 2008 | Product Number: G11L05 | Price: $102.00

Bull 11L2
Catalog of Analog Computer Dynamometer Cards

This bulletin contains over 1100 polished rod dynamometer cards taken with the electronic analog simulator and arranged in convenient form for comparison with field tests. Pages: 77

1st Edition | December 1969 | Reaffirmed: September 1, 1999
Product Number: G05700 | Price: $118.00

Bull 11L3
Sucker Rod Pumping System Design Book
(includes errata, dated November 1973, and Supplement, dated February 1977)

Contains print-out tables of computer calculated values for selecting sucker rod systems. Values are included for depths of 200 feet to 12,000 feet in increments of 500 feet; and production rates of 100 barrels per day to over 1,500 barrels per day in varying increments. Various rod string pump stroke, pump size and pumping speed combinations that will do the job within the limiting parameters are listed. Pages: 574

1st Edition | May 1970 | Product Number: G05800 | Price: $128.00

TR 11L6
Technical Report on Electric Motor Prime Mover for Beam Pumping Unit Service

Covers polyphase, squirrel-cage, induction motors for use as the prime mover for beam pumping units (size range of 200 hp and below). Motors to be operated from solid-state or other types of variable frequency/variable voltage power supplies for adjustable speed applications will require individual consideration to provide satisfactory performance and are beyond the scope of this document. Motors conforming to this document are suitable for operation in accordance with their full load rating under ambient temperature at a maximum altitude of 1000 m (3300 ft.) above sea level with outdoor sever duty application, including blowing dust or snow, corrosive atmospheres, high humidity, and cyclic loading. Pages: 13

2nd Edition | May 2008 | Product Number: G11L602 | Price: $83.00

* These translated versions are provided for the convenience of our customers and are not officially endorsed by API. The translated versions shall neither replace nor supersede the English-language versions, which remain the official Standards. API shall not be responsible for any discrepancies or interpretations of these translations. Translations may not include any Addenda or Errata to the document. Please check the English-language versions for any updates to the documents.

RP 11S
Recommended Practice for the Operation, Maintenance and Troubleshooting of Electric Submersible Pump Installations

Covers all of the major components that comprise a standard electric submersible pumping system, their operation, maintenance, and troubleshooting. It is specifically prepared for installations in oil and water producing wells where the equipment is installed on tubing. It is not prepared for equipment selection or application. Pages: 18

3rd Edition | November 1994 | Reaffirmed: April 22, 2008
Product Number: G11S03 | Price: $80.00

RP 11S1
Recommended Practice for Electrical Submersible Pump Teardown Report

Covers a recommended electrical submersible pump teardown report form. It also includes equipment schematic drawings which may provide assistance in identifying equipment components. These schematics are for generic equipment components, and there may be differences between manufacturers on the exact description or configuration of the assemblies. Pages: 36

3rd Edition | September 1997 | Effective Date: December 15, 1997
Reaffirmed: April 29, 2008 | Product Number: G11S13 | Price: $118.00

RP 11S2
Electric Submersible Pump Testing

Provides guidelines and procedures covering electric submersible pump performance testing intended to establish product consistency. These practices are generally considered appropriate for the majority of pump applications. This document covers the acceptance testing of electric submersible pumps (sold as new) by manufacturers, vendors, or users to the prescribed minimum specifications. Pages: 12

2nd Edition | August 1997 | Effective Date: October 1, 1997
Reaffirmed: April 29, 2008 | Product Number: G11S22 | Price: $80.00

RP 11S2 *
Electric Submersible Pump Testing—Russian

The Russian translation of Recommended Practice 11S2.

2nd Edition | August 1997 | Product Number: G11S22 | Price: $84.00

RP 11S5
Recommended Practice for the Application of Electric Submersible Cable Systems

Covers the application (size and configuration) of electrical submersible cable systems by manufacturers, vendors, or users. The document addresses the varies uses of different cable insulation systems, including jackets, braids, armor and related coverings, as well as auxiliary cable components for cable conductors. The document also addresses splicing and terminating cables including splicing, lengthening and repairs.

2nd Edition | April 2008 | Product Number: G11S52 | Price: $105.00

RP 11S6
Recommended Practice for Testing of Electric Submersible Pump Cable Systems

Covers field testing of electric submersible pump cable systems. This document is organized into three major topic categories. The first category provides general definitions and an overview of terms, safety considerations, and cable system preparation guidelines. The second category identifies various situations under which testing is performed. The third category identifies test methods and procedures.

1st Edition | December 1995 | Reaffirmed: April 29, 2008
Product Number: G11S61 | Price: $86.00

RP 11S7
Recommended Practice on Application and Testing of Electric Submersible Pump Seal Chamber Section

Applies to the seal chamber section used in support of an electric submersible motor. The recommended practice contains tutorial, testing, and failure evaluation information on the seal chamber section used in support of an electric submersible motor. The document provides a general understanding of construction and functioning of seal chamber sections, identification of well conditions, system requirements, and characteristics that influence component section and application. Pages: 28

1st Edition | July 1993 | Reaffirmed: April 29, 2008
Product Number: G05947 | Price: $86.00

RP 11S8
Recommended Practice on Electric Submersible Pump System Vibrations

Provides guidelines to establish consistency in control and analysis of ESP system vibrations. These recommended practices are those generally considered appropriate for the acceptance testing of ESP systems and subsystems for the majority of ESP applications. This recommended practices covers the vibration limits, testing, and analysis of electric submersible pump systems and subsystems. Pages: 15

1st Edition | May 1993 | Reaffirmed: April 22, 2008
Product Number: G05948 | Price: $73.00

RP 11AR
Recommended Practice for Care and Use of Subsurface Pumps

Provides information on the proper selection, operation and maintenance of subsurface pumps so the best economical life can be obtained. Pages: 50

4th Edition | June 2000 | Reaffirmed: April 2, 2008
Product Number: G11AR4 | Price: $121.00

Spec 11AX ◆
Specification for Subsurface Sucker Rod Pumps and Fittings

Covers rod pumps and tubing pumps in commonly used bore sizes. Sufficient dimensional requirements are provided to assure interchangeability and standardization of all component parts; however, details of design are not specified. Standard materials are specified. Pages: 94

12th Edition | June 2006 | Effective Date: October 1, 2006
Product Number: G11AX12 | Price: $130.00

Std 11D3/ISO 15136-2:2006
Progressing Cavity Pump Systems for Artificial Lift—Surface-drive Systems

Petroleum and natural gas industries—Progressive cavity pumps systems for artificial lift—Part 2: Surface drive systems

Provides requirements for the design, design verification and validation, manufacturing and data control, performance ratings and repair of progressing cavity pump surface-drive systems for use in the petroleum and natural gas industry. This standard is applicable to those products meeting the definition of surface-drive systems. Additionally, informative annexes provide information on brake system selection, installation, and operation; and sucker rod selection and use. Equipment not covered by this standard, unless integral by design, includes bottom drive systems, sucker rods, polished rod clamps, stuffing boxes, electrical controls, instrumentation, external power transmission devices, auxiliary equipment, such as belts, sheaves and equipment guards.

This edition of API Std 11D3 is the identical national adoption of ISO 15136, *Petroleum and natural gas industries—Progressive cavity pumps systems for artificial lift—Part 2: Surface drive systems.* Pages: 99

1st Edition | June 2008 | Product Number: G11D301 | Price: $102.00

* These translated versions are provided for the convenience of our customers and are not officially endorsed by API. The translated versions shall neither replace nor supersede the English-language versions, which remain the official Standards. API shall not be responsible for any discrepancies or interpretations of these translations. Translations may not include any Addenda or Errata to the document. Please check the English-language versions for any updates to the documents.

RP 11S3
Electric Submersible Pump Installations

Addresses the installation and replacement of all major components comprising an electrical submersible pumping system. Specifically, it addresses equipment installation on tubing in oil and gas production operations Pages: 11

2nd Edition | March 1999 | Reaffirmed: April 29, 2008
Product Number: G11S32 | Price: $86.00

RP 11S3 *
Electric Submersible Pump Installations—Russian

The Russian translation of Recommended Practice 11S3.

2nd Edition | March 1999 | Product Number: G11S32 | Price: $90.00

RP 11S4
Recommended Practice for Sizing and Selection of Electric Submersible Pump Installations

This document discusses in some detail each component of the ESP system (pump, motor, intake, seal or protector, cable, switchboard, etc.) as far as what must be considered for the best selection at a desired rate and well conditions. Examples are given to illustrate the basic design procedure and illustrate how PVT correlations, multiphase flow correlations, and inflow performance relationships are used. Summary designs and computer examples using the detailed design principles are presented which show how design considerations fit together, and how tools such as computer programs allow faster solutions resulting in easier trial and error calculations for optimization of designs and study of existing installations. Topics such as PVT correlations, multiphase flow correlations, and inflow performance relationships are discussed in the appendices. Pages: 31

3rd Edition | June 2001 | Reaffirmed: April 22, 2008
Product Number: G11S43 | Price: $76.00

RP 500
Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2
(ANSI/API RP 500-1998)

Provides guidelines for determining the degree and extent of Class I, Division 1 and Class I, Division 2 locations at petroleum facilities, for the selection and installation of electrical equipment. Basic definitions provided in the "National Electric Code" have been followed in developing this document which applies to the classification of locations for both temporarily and permanently installed electrical equipment. RP 500 is intended to be applied where there may be a risk of ignition due to the presence of flammable gas or vapor, mixed with air under normal atmospheric conditions. Pages: 121

2nd Edition | November 1997 | Reaffirmed: November 1, 2002
Product Number: C50002 | Price: $197.00

RP 505
Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1 and Zone 2
(ANSI/API RP 505-1998)

Provides guidelines for determining the degree and extent of Class I, Zone 0, Zone 1, and Zone 2 locations at petroleum facilities, for the selection and installation of electrical equipment. Basic definitions provided in the National Electrical Code have been followed in developing this document which applies to the classification of locations for both temporarily and permanently installed in electrical equipment. RP 505 is intended to be applied where there may be a risk of ignition due to the presence of flammable gas or vapor, mixed with air under normal atmospheric conditions. Pages: 131

1st Edition | November 1997 | Reaffirmed: November 1, 2002
Product Number: C50501 | Price: $197.00

LEASE PRODUCTION VESSELS

Spec 12B ◆
Specification for Bolted Tanks for Storage of Production Liquids

Covers material, design, fabrication, and testing requirements for vertical, cylindrical, aboveground, closed and open top, bolted steel storage tanks with internal pressures approximately atmospheric at various sizes and capacities ranging from 100 to 10000 barrels. Tanks covered by this specification have been designed using established engineering calculations to determine minimum metal thickness and bolting specifications for each size tank filled with water. This specification is designed to provide the oil production industry with tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. Pages: 33

15th Edition | October 2008 | Effective Date: March 31, 2009
Product Number: G12B15 | Price: $94.00

Spec 12D ◆
Specification for Field Welded Tanks for Storage of Production Liquids

Covers material, design, fabrication, and testing requirements for vertical, cylindrical, aboveground, closed top, welded steel storage tanks with internal pressures approximately atmospheric at various sizes and capacities ranging from 500 to 10000 barrels. Tanks covered by this specification have been designed using established engineering calculations to determine minimum metal thickness and bolting specifications for each size tank filled with water. This specification is designed to provide the oil production industry with tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. Pages: 27

11th Edition | October 2008 | Effective Date: March 31, 2009
Product Number: G12D11 | Price: $94.00

Spec 12F ◆
Specification for Shop Welded Tanks for Storage of Production Liquids

Covers material, design, fabrication, and testing requirements for shop-fabricated vertical, cylindrical, aboveground, closed top, welded steel storage tanks with internal pressures approximately atmospheric at various sizes and capacities ranging from 90 to 750 barrels. Tanks covered by this specification have been designed using established engineering calculations to determine minimum metal thickness and bolting specifications for each size tank filled with water. This specification is designed to provide the oil production industry with tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. Pages: 25

12th Edition | October 2008 | Effective Date: March 31, 2009
Product Number: G12F12 | Price: $94.00

Spec 12J ◆
Specification for Oil and Gas Separators

Covers minimum requirements for the design, fabrication, and plant testing of oil and gas separators and oil-gas-water separators that are used in the production of oil and gas, and are located at some point on the producing flow line between the wellhead and pipeline. Separators covered by this specification may be vertical, spherical, or single or double barrel horizontal. Unless otherwise agreed upon between the purchaser and the manufacturer, the jurisdiction of this specification terminates with the pressure vessel as

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defined in Section VII, Division 1 of the ASME *Boiler and Pressure Vessel Code*. Pressure vessels covered by this specification are normally classified as natural resource vessels. Separators outside the scope of this specification include centrifugal separators, filter separators and desanding separators. Pages: 25

8th Edition | October 2008 | Effective Date: March 31, 2009
Product Number: G12J08 | Price: $94.00

Spec 12K ◆
Specification for Indirect Type Oilfield Heaters

Covers minimum requirements for the design, fabrication, and shop testing of oilfield indirect type fired heaters that are used in the production of oil, gas and associated fluid. The heaters are located at some point on the producing flowline between the wellhead and pipeline. Heater components covered by this specification include the pressurized coils, the shell, heater bath, firetube and the firing system. For purposes of this specification, the termination of a heater coil is at the first bevel when coils are furnished beveled for welding, or the face of the first fitting when fittings are furnished as the inlet or outlet connection to the coil. All fittings and valves between the inlet and outlet of the coil are to be considered within the coil limit. Heaters outside the scope of this specification include steam and other vapor generators, reboilers, indirect heaters employing heat media other than water solutions, all types of direct fired heaters, shell-and-tube bundles or electrical heating elements, and coils operating at temperatures less than –20 °F. Pages: 35

8th Edition | October 2008 | Effective Date: March 31, 2009
Product Number: G12K08 | Price: $111.00

Spec 12L ◆
Specification for Vertical and Horizontal Emulsion Treaters

Covers minimum requirements for material, design, fabrication, and testing of vertical and horizontal emulsion treaters. Emulsion treating is normally conducted on crude oil immediately after it is separated from its associated gas in a vessel referred to as a treater or sometimes as a heater treater. High gas-oil ratio wells or those produced by gas lift may require the installation of an oil and gas separator upstream of the treater to remove most of the associated gas before the emulsion enters the treater. Where the water to oil ratio is high, freewater knockouts may be required upstream of the treater. The jurisdiction of this specification terminates with each pressure vessel as applicable: the emulsion treater with firetube(s) and, if used, the heat exchanger(s) and water siphon. Pressure vessels covered by this specification are classified as natural resource vessels. An emulsion treater is a pressure vessel used in the oil producing industry for separating oil-water emulsions and gas, and for breaking or resolving emulsified well streams into water and saleable clean oil components. Emulsion treaters are usually equipped with one or more removable firetubes or heat exchange elements through which heat is applied to the water and/or emulsion to aid the emulsion breaking process. Pages: 39

5th Edition | October 2008 | Effective Date: March 31, 2009
Product Number: G12L05 | Price: $94.00

RP 12N
Operations, Maintenance and Testing of Firebox Flame Arrestors

Covers practices that should be considered in the installation, maintenance, and testing of firebox flame arrestors installed on the air intake of oilfield production equipment. Pages: 6

2nd Edition | November 1994 | Reaffirmed: April 2, 2008
Product Number: G12N02 | Price: $80.00

Spec 12P ◆
Specification for Fiberglass Reinforced Plastic Tanks

Covers material, design, fabrication, and testing requirements for fiberglass reinforced plastic (FRP) tanks. Only shop-fabricated, vertical, cylindrical tanks are covered. Tanks covered by this specification are intended for above ground and atmospheric pressure service at various sizes and capacities ranging from 90 to 1500 barrels. Unsupported cone bottom tanks are outside the scope of this specification. Standard designs are based on a maximum working pressure equal to the hydrostatic head of the stored fluid plus 6 in. of water column (0.217 psig) and 2 in. of water column vacuum. Design criteria are dependent on method of construction. Filament winding, chop-spray and combinations of these methods (commonly referred to as chop-hoop) are covered. Tanks constructed using hand lay-up (contact molding) are to be designed to the same standard as chop-spray construction. Pages: 27

3rd Edition | October 2008 | Effective Date: March 31, 2009
Product Number: G12P03 | Price: $94.00

RP 12R1
Recommended Practice for Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service

This RP should be considered as a guide on new tank installations and maintenance of existing tanks. It contains recommendations for good practices in (a) the collection of well or lease production, (b) gauging, (c) delivery to pipeline carriers for transportation, and (d) other production storage and treatment operations. This recommended practice is intended primarily for application to tanks fabricated to API Specs 12F, 12D, 12F, and 12P when employed in on-land production service; but its basic principles are applicable to atmospheric tanks of other dimensions and specifications when they are employed in similar oil and gas production, treating, and processing services. It is not applicable to refineries, petrochemical plants, marketing bulk stations, or pipeline storage facilities operated by carriers. Pages: 49

5th Edition | August 1997 | Reaffirmed: April 2, 2008
Product Number: G12R15 | Price: $128.00

DRILLING FLUID MATERIALS

Spec 13A/ISO 13500:2009 ■◆
Specification for Drilling Fluid Materials
Petroleum and natural gas industries—Drilling Fluids—Specifications and testing

Covers physical properties and test procedures for materials manufactured for use in oil- and gas-well drilling fluids. The materials covered are barite, haematite, bentonite, nontreated bentonite, OCMA-grade bentonite, attapulgite, sepiolite, technical-grade low-viscosity carboxymethylcellulose (CMC LVT), technical-grade high-viscosity carboxymethylcellulose (CMC-HVT), starch, low-viscosity polyanionic cellulose (PAC-LV), high-viscosity polyanionic cellulose (PAC-HV), drilling-grade Xanthan gum, and barite 4,1. This Standard is intended for the use of manufacturers of named products.

This edition of API Spec 13A is the identical national adoption of ISO 13500, *Petroleum and natural gas industries—Drilling Fluids—Specifications and testing*, and includes the addition of an API Monogram Annex. Pages: 109

18th Edition | February 2010 | Effective Date: August 1, 2010
Product Number: GX13A018 | Price: $175.00

RP 13B-1/ISO 10414-1:2008 ■
Recommended Practice for Field Testing Water-Based Drilling Fluids
Petroleum and natural gas industries—Field testing of drilling fluids—Part 1: Water-based fluids

Provides standard procedures for determining the following characteristics of water based drilling fluids:

- drilling fluid density (mud weight);
- viscosity and gel strength;
- filtration;
- water, oil and solids contents;
- sand content;
- methylene blue capacity;
- pH;
- alkalinity and lime content;
- chloride content;

- total hardness as calcium.

Annexes A through K provide additional test methods.

This edition of API 13B-1 is the identical national adoption of ISO 10414-1:2008, *Petroleum and natural gas industries—Field testing of drilling fluids—Part 1: Water-based fluids*. Pages: 91

4th Edition | March 2009 | Product Number: GX13B14 | Price: $160.00

RP 13B-2

Recommended Practice for Field Testing Oil-based Drilling Fluids

Provides standard procedures for determining the following characteristics of oil-based drilling fluids:

- drilling fluid density (mud weight);
- viscosity and gel strength;
- filtration;
- oil, water and solids contents;
- alkalinity, chloride content and calcium content;
- electrical stability;
- lime and calcium contents, calcium chloride and sodium chloride contents;
- low-gravity solids and weighting material contents. Pages: 100

4th Edition | February 2005 | Product Number: G13B204 | Price: $158.00

RP 13C

Recommended Practice on Drilling Fluid Processing Systems Evaluation

(includes Errata dated April 2005)
(supersedes RP 13E)

Covers the standard procedure for assessing and modifying the performance of a solids control equipment system in the field. These guidelines can be used to modify the operation of the equipment and the removal system, and thus improve the efficiency of the equipment in use. Pages: 52

3rd Edition | December 2004 | Product Number: G13C03 | Price: $89.00

RP 13D

Recommended Practice on the Rheology and Hydraulics of Oil-well Drilling Fluids

Provides a basic understanding of and guidance about drilling fluid rheology and hydraulics, and their application to drilling operations. The target audience for this RP covers both the office and wellsite engineer. The complexity of the equations used is such that a competent engineer can use a simple spreadsheet program to conduct the analyses. Given that the equations used herein are constrained by the spreadsheet limitation, more advanced numerical solutions containing multiple subroutines and macros are not offered. This limitation does not mean that only the results given by the spreadsheet methods are valid engineering solutions. The purpose for updating the existing RP, last published in May 2003, is to make the work more applicable to the complex wells that are now commonly drilled. These include: High-Temperature/High-Pressure (HTHP), Extended-Reach Drilling (ERD), and High-Angle Wells (HAW). Drilling fluid rheology is important in the following determinations:

- calculating frictional pressure losses in pipes and annuli;
- determining equivalent circulating density of the drilling fluid under downhole conditions;
- determining flow regimes in the annulus;
- estimating hole-cleaning efficiency;
- estimating swab/surge pressures;
- optimizing the drilling fluid circulating system for improved drilling efficiency. Pages: 80

5th Edition | June 2006 | Product Number: G13D05 | Price: $98.00

RP 13I/ISO 10416:2008 ■

Recommended Practice for Laboratory Testing of Drilling Fluids

Petroleum and natural gas industries—Drilling fluids—Laboratory testing

Provides procedures for the laboratory testing of both drilling fluid materials and drilling fluid physical, chemical and performance properties. It is applicable to both water-based and oil-based drilling fluids, as well as the base or "make-up" fluid. It is not applicable as a detailed manual on drilling fluid control procedures. Recommendations regarding agitation and testing temperature are presented because the agitation history and temperature have a profound effect on drilling fluid properties.

This edition of API RP 13I is the identical national adoption of ISO 10416:2008, *Petroleum and natural gas industries—Drilling fluids—Laboratory testing*. Pages: 108

8th Edition | March 2009 | Product Number: GX13I8 | Price: $180.00

RP 13J/ISO 13503-3:2005

Testing of Heavy Brines

Petroleum and natural gas industries—Completion fluids and materials—Part 3: Testing of heavy brines

Covers heavy brines commonly used in petroleum and natural gas completion, workover and drill-in fluids. These brines can be purchased or rented from multiple sources, and are available worldwide. No single source or limited source of supply is included, either by inference or reference. Also provides methods for assessing the performance and physical characteristics of heavy brines for use in field operations. It includes procedures for evaluating the density or specific gravity, clarity or amount of particulate matter carried in the brine, crystallization point or the temperature (both ambient and under pressure) at which the brines make the transition between liquid and solid, pH, and iron contamination. It also contains a discussion of gas hydrate formation and mitigation, buffering capacity and a standardized reporting form.

This edition of API 13J is the identical national adoption of ISO 13503-3:2005, *Petroleum and natural gas industries—Completion fluids and materials—Part 3: Testing of heavy brines*. Pages: 43

4th Edition | May 2006 | Product Number: G13J04 | Price: $120.00

RP 13K

Chemical Analysis of Barite

(includes Errata dated April 1998)

Provides a comprehensive, detailed description of the chemical analytical procedures for quantitatively determining the mineral and chemical constituents of barite. Pages: 25

2nd Edition | February 1996 | Reaffirmed: August 1, 2006
Product Number: G13K02 | Price: $86.00

RP 13L

Recommended Practice for Training and Qualification of Drilling Fluid Technologists

A written summary of basic training and knowledge that an employee or contractor shall possess to be identified as a drilling fluids technologist. This RP seeks to formalize the specific knowledge base, professional skills, and application skills needed to ensure the competency and professionalism of individuals working in the drilling fluids industry. Drilling fluids technologists should use this RP as an outline to self-determine any gaps in learning and seek to improve their skills. A company contracting the service of a drilling fluids technologist should use this RP as a checklist of knowledge that a technologist should be able to demonstrate proficiency in applying Pages: 7

1st Edition | February 2003 | Product Number: G13L01 | Price: $51.00

RP 13M/ISO 13503-1:2003

Recommended Practice for the Measurement of Viscous Properties of Completion Fluids

Petroleum and natural gas industries—Completion fluids and materials—Part 1: Measurement of viscous properties of completion fluids

(RP 13M replaces API RP 39)

Provides consistent methodology for determining the viscosity of completion fluids used in the petroleum and natural gas industries. For certain cases, methods are also provided to determine the rheological properties of a fluid.

This edition of API RP 13M is the identical national adoption of ISO 13503-1, *Petroleum and natural gas industries—Completion fluids and materials—Part 1: Measurement of viscous properties of completion fluids*. Pages: 21

1st Edition | July 2004 | Product Number: GX13M01 | Price: $95.00

RP 13M-4/ISO 13503-4:2006

Recommended Practice for Measuring Stimulation and Gravel-pack Fluid Leakoff Under Static Conditions

Petroleum and natural gas industries—Completion fluids and materials—Part 4: Procedures for marring stimulation and gravelpack fluid leakoff under static conditions

Provides for consistent methodology to measure fluid loss of stimulation and gravel-pack fluid under static conditions. However, the procedure in this Recommended Practice excludes fluids that react with porous media.

This edition of API RP 13M-4 is the identical national adoption of ISO 13503-4, *Petroleum and natural gas industries—Completion fluids and materials—Part 4: Procedures for measuring stimulation and gravelpack fluid leakoff under static conditions*. Pages: 14

1st Edition | December 2006 | Product Number: GG13M41 | Price: $55.00

OFFSHORE SAFETY AND ANTI-POLLUTION

Spec 14A/ISO 10432:2004 ◆

Specification for Subsurface Safety Valve Equipment

Petroleum and natural gas industries—Downhole equipment—Subsurface safety valve equipment

Provides the minimum acceptable requirements for subsurface safety valves (SSSVs). It covers subsurface safety valves including all components that establish tolerances and/or clearances which may affect performance or interchangeability of the SSSVs. It includes the interface connections to the flow control or other equipment, but does not cover the connections to the well conduit.

This edition of API Spec 14A is the identical national adoption of ISO 10432, *Petroleum and natural gas industries—Downhole equipment—Subsurface safety valve equipment*. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 79

11th Edition | October 2005 | Effective Date: May 1, 2006
Product Number: GX14A11 | Price: $166.00

RP 14B/ISO 10417:2004

Design, Installation, Repair and Operation of Subsurface Safety Valve Systems

Petroleum and natural gas industries—Subsurface safety valve systems—Design, installation, operation and redress

Establishes requirements and provides guidelines for configuration, installation, test, operation and documentation of subsurface safety valve (SSSV) systems. In addition, this Standard establishes requirements and provides guidelines for selection, handling, redress and documentation of SSSV downhole production equipment.

This edition of API RP 14B is the identical national adoption of ISO 10417, *Petroleum and natural gas industries—Subsurface safety valve systems—Design, installation, operation and redress*. Pages: 31

5th Edition | October 2005 | Product Number: GX14B05 | Price: $111.00

RP 14B/ISO 10417:2004 *

Design, Installation, Repair and Operation of Subsurface Safety Valve Systems—Russian

Russian translation of Recommended Practice 14B.

5th Edition | October 2005 | Product Number: GX14B05 | Price: $117.00

RP 14C

Analysis, Design, Installation and Testing of Basic Surface Safety Systems on Offshore Production Platforms

Presents a standardized method to design, install, and test surface safety systems on offshore production platforms. Uses recognized systems analysis methods to develop requirements for a safety system, and includes procedures to document the safety system and verify conformance. Pages: 110

7th Edition | March 2001 | Reaffirmed: March 1, 2007
Product Number: G14C07 | Price: $195.00

RP 14E

Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems

(ANSI/API RP 14E-1992)

Recommends minimum requirements and guidelines for the design and installation of new piping systems on offshore production platforms. Includes general recommendations on design and application of pipe, valves, and fittings for typical processes; general information on installation, quality control, and items related to piping systems such as insulation; and specific recommendations for the design of particular piping systems. Pages: 61

5th Edition | October 1991 | Reaffirmed: March 1, 2007
Product Number: G07185 | Price: $144.00

RP 14F

Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Division 1, and Division 2 Locations

Recommends minimum requirements and guidelines for the design, installation, and maintenance of electrical systems on fixed and floating petroleum facilities located offshore. For facilities classified as Zone 0, Zone 1 or Zone 2, reference API 14FZ, *Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Zone 0, Zone 1 or Zone 2*. These facilities include drilling, producing and pipeline transportation facilities associated with oil and gas exploration and production. This RP is not applicable to Mobile Offshore Drilling Units (MODUs) without production facilities. This document is intended to bring together in one place a brief description of basic desirable electrical practices for offshore electrical systems. The recommended practices contained herein recognize that special electrical considerations exist for offshore petroleum facilities. Pages: 150

5th Edition | July 2008 | Product Number: G14F05 | Price: $115.00

RP 14FZ

Design and Installation of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Zone 0, Zone 1, and Zone 2 Locations

Recommends minimum requirements and guidelines for the design and installation of electrical systems on fixed and floating petroleum facilities located offshore when hazardous locations are classified as Zone 0, Zone 1, or Zone 2. These facilities include drilling, producing and pipeline transportation facilities associated with oil and gas exploration and production. RP 14FZ describes basic desirable electrical practices for offshore electrical systems. This document recognizes that special electrical considerations exist for offshore petroleum facilities. These special

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considerations include the inherent electrical shock possibility presented by the marine environment and steel decks; space limitations that require equipment be installed in or near classified locations; the corrosive marine environment; motion and buoyancy concerns associated with floating facilities. RP 14FZ applies to both permanent and temporary electrical installations, and the guidelines provide a high level of electrical safety when used in conjunction with well-defined area classifications. This document emphasizes safe practices for classified locations on offshore petroleum facilities but does not include guidelines for classification of areas. Pages: 117

1st Edition | September 2001 | Reaffirmed: March 1, 2007
Product Number: G14FZ1 | Price: $179.00

RP 14G
Recommended Practice for Fire Prevention and Control on OpenType Offshore Production Platforms

Presents recommendations for minimizing the likelihood of an accidental fire, and for designing, inspecting, and maintaining fire control systems. It emphasizes the need to train personnel in fire fighting, to conduct routine drills, and to establish methods and procedures for safe evacuation. The fire control systems discussed are intended to provide an early response to incipient fires and prevent their growth. Applicable to fixed open-type offshore production platforms that are generally installed in moderate climates and that have sufficient natural ventilation to minimize the accumulation of vapors. Enclosed areas, such as quarters, buildings, and equipment enclosures, normally installed on this type platform, are addressed. Pages: 38

4th Edition | March 2007 | Product Number: G14G04 | Price: $120.00

RP 14J
Recommended Practice for Design and Hazards Analysis for Offshore Production Facilities

Provides useful procedures and guidelines for planning, designing, and arranging offshore production facilities; and performing a hazards analysis on open-type offshore production facilities. Discusses several procedures that can be used to perform a hazards analysis, and presents minimum requirements for process safety information and hazards analysis that can be used for satisfying API RP 75, *Development of a Safety and Environmental Management Program for Outer Continental Shelf (OCS) Operations and Facilities*. Pages: 75

2nd Edition | April 2001 | Reaffirmed: March 1, 2007
Product Number: G14J02 | Price: $113.00

Spec 14L/ISO 16070:2005 ◆
Specification for Lock Mandrels and Landing Nipples
Petroleum and natural gas industries—Downhole equipment—Lock mandrels and landing nipples

Provides the requirements for lock mandrels and landing nipples within the production/injection conduit for the installation of flow control or other equipment used in the petroleum and natural gas industries. It includes the interface connections to the flow control or other equipment, but does not cover the connections to the well conduit.

This edition of API Specification 14L is an identical adoption of ISO 16070, *Petroleum and natural gas industries—Downhole equipment—Lock mandrels and landing nipples*. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 25

2nd Edition | July 2007 | Product Number: GG14L02 | Price: $115.00

Bull 91
Planning and Conducting Surface Preparation and Coating Operations for Oil and Natural Gas Drilling and Production Facilities in a Marine Environment

Worldwide, marine exploration, production, development and decommissioning operations are conducted from a variety of structures. These installments must be inspected periodically and maintained in order to assure structural integrity and minimize pollution risks. Maintenance of an offshore structure, regardless of its classification, necessarily includes blasting and coating activities. The purpose of this publication is to establish practices and procedures that should be followed to minimize the discharge of spent blast abrasive, and paint overspray to the surrounding waters during these activities. Pages: 16

1st Edition | June 2007 | Product Number: G09101 | Price: $59.00

FIBERGLASS AND PLASTIC PIPE

RP 15CLT
Recommended Practice for Composite Lined Steel Tubular Goods

Provides guidelines for the design, manufacturing, qualification and application of composite lined carbon steel downhole tubing in the handling and transport of multiphase fluids, hydrocarbon gasses, hydrocarbon liquids and water. The principles outlined in this RP also apply to line pipe applications. Composite lined tubing typically consists of a fiber reinforced polymer liner within the steel host, providing protection of that steel host from corrosive attack. Both API and premium connections can be employed, typically using corrosive barrier rings to maintain corrosion resistance between ends of adjacent liners. This document contains recommendations on material selection, product qualification, and definition of safety and design factors. Quality control tests, minimum performance requirements are included. The RP applies to composite lined carbon steel for systems up to 10 in. (250 mm) diameter, operating at pressures up to 10,000 psi (69 MPa) and maximum temperatures of 300 °F (150 °C). The principles described in this document can easily be extended to apply to products being developed by manufacturers for application outside this range. Pages: 13

1st Edition | September 2007 | Product Number: G15CLT1 | Price: $80.00

Spec 15HR ◆
High Pressure Fiberglass Line Pipe
(includes Addendum, dated November 2004)

Formulated to provide for the availability of safe, dimensionally and functionally interchangeable high pressure fiberglass line pipe with a Spec 15HR Standard Pressure Rating from 500 psi to 5000 psi, inclusive, in 250 psi increments. This specification is limited to mechanical connections. Pages: 25

3rd Edition | August 2001 | Product Number: G15HR3 | Price: $94.00

Spec 15LE ◆
Polyethylene (PE) Line Pipe

The purpose of this specification is to provide standards for polyethylene (PE) line pipe suitable for use in conveying oil, gas and non-potable water in underground, above ground and reliner applications for the oil and gas producing industries. The technical content of this document provides requirements and guidelines for performance, design, materials inspection, dimensions and tolerances, marking, handling, storing and shipping. Pages: 38

4th Edition | January 2008 | Effective Date: July 1, 2008
Product Number: G15LE4 | Price: $98.00

Spec 15LR ◆
Low Pressure Fiberglass Line Pipe

Covers filament wound (FW) and centrifugally cast (CC) fiberglass line pipe and fittings for pipe in diameters up to and including 24 in. in diameter and up to and including 1000 psig cyclic operating pressures. In addition, at the manufacturer's option, the pipe may also be rated for static operating pressures up to 1000 psig. It is recommended that the pipe and fittings be purchased by cyclic pressure rating. The standard pressure ratings range from 150 psig to 300 psig in 50 psig increments, and from 300 psig to 1000 psig in 100 psig increments, based on either cyclic pressure or static pressure. Pages: 25

7th Edition | August 2001 | Effective Date: February 1, 2002
Reaffirmed: May 1, 2008 | Product Number: G15LR7 | Price: $94.00

RP 15S
Qualification of Spoolable Reinforced Plastic Line Pipe

Provides guidelines for the design, manufacture, qualification and application of spoolable reinforced plastic line pipe in oilfield flowline applications, including transport of multiphase fluids, hydrocarbon gases, hydrocarbon liquids and water. Such products typically consist of a continuous plastic liner reinforced with either glass reinforced epoxy-Spoolable Composite Pipe (SCP), or aramid fibers-Reinforced Thermoplastic Pipe (RTP). They are continuous flowline systems capable of being reeled for storage, transport and installation. For offshore use, additional requirements may apply Pages: 26

1st Edition | March 2006 | Product Number: G15S01 | Price: $94.00

RP 15TL4
Care and Use of Fiberglass Tubulars

Provides information on the transporting, handling, installing, and reconditioning of fiberglass tubulars in oilfield usage. Appendices are also included to cover adhesive bonding, repair procedures, and inspection practices. Pages: 20

2nd Edition | March 1999 | Reaffirmed: May 1, 2008
Product Number: G15TL4 | Price: $94.00

DRILLING WELL CONTROL SYSTEMS

Spec 16A/ISO 13533:2001 ◆
Specification for Drill-through Equipment
Petroleum and natural gas industries—Drilling and production equipment—Drill through equipment (includes Supplement/Errata, dated November 2004)

Provides requirements for performance, design, materials, testing and inspection, welding, marking, handling, storing and shipping of drill-through equipment used for drilling for oil and gas. It also defines service conditions in terms of pressure, temperature and wellbore fluids for which the equipment will be designed.

This specification is applicable to and establishes requirements for the following specific equipment:

- ram blowout preventers;
- ram blocks, packers and top seals;
- annular blowout preventers;
- annular packing units;
- hydraulic connectors;
- drilling spools;
- adapters;
- loose connections;
- clamps.

This International Standard does not apply to field use or field testing of drill-through equipment.

This edition of API RP 16A is a modified adoption of ISO 13533, *Petroleum and natural gas industries—Drilling and production equipment—Drill through equipment*. Pages: 109

3rd Edition | June 2004 | Effective Date: December 1, 2004
Product Number: GX16A03 | Price: $160.00

Spec 16C ◆
Choke and Kill Systems

Provides for safe and functionally interchangeable surface and subsea choke and kill systems equipment utilized for drilling and gas wells. Other parts of the choke and kill system not specifically addressed in this document shall be in accordance with the applicable sections of this specification. Technical content of this document provides the minimum requirement for performance, design, materials, welding, testing, inspection, storing, and shipping. Pages: 61

1st Edition | January 1993 | Reaffirmed: July 1, 2001
Product Number: G07242 | Price: $128.00

Spec 16D ◆
Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment

Establishes design standards for systems used to control blowout preventers (BOPs) and associated valves that control well pressure during drilling operations. The design standards applicable to subsystems and components do not include material selection and manufacturing process details but may serve as an aid to the purchaser. Although diverters are not considered well control devices, their controls are often incorporated as part of the BOP control system and therefore are included in this specification. The requirements provided in this specification apply to the following control system categories:

- control systems for surface mounted BOP stacks;
- control systems for subsea BOP stacks (common elements);
- discrete hydraulic control systems for subsea BOP stacks;
- electro-hydraulic/multiplex control systems for subsea BOP stacks;
- control systems for diverter equipment;
- auxiliary equipment control systems and interfaces;
- emergency disconnect sequenced systems;
- backup systems;
- special deepwater/harsh environment features. Pages: 97

2nd Edition | July 2004 | Effective Date: January 1, 2005
Product Number: G16D02 | Price: $171.00

Spec 16F ◆
Specification for Marine Drilling Riser Equipment

Establishes standards of performance and quality for the design, manufacture, and fabrication of marine drilling riser equipment used in conjunction with a subsea blowout preventer (BOP) stack. This specification covers the following major subsystems in the marine drilling riser system:

- riser tensioner equipment;
- flex/ball joints;
- choke, kill and auxiliary lines;
- drape hoses and jumper lines for flex/ball joints;
- telescopic joint (slip joint) and tensioner ring;
- riser joints;
- buoyancy equipment;
- riser running equipment;
- special riser system components;
- lower riser adapter Pages: 43

1st Edition | August 2004 | Product Number: G16F01 | Price: $115.00

Bull 16J
Comparison of Marine Drilling Riser Analyses
(Formerly API Bull 2J)

Provides a comparison of existing computer programs for design of marine drilling risers. Shows the degree of agreement among a representative group of riser analysis computer programs and presents data that can be used to help validate other programs.

1st Edition | August 1992 | Product Number: G07246 | Price: $73.00

RP 16Q
Design, Selection, Operation and Maintenance of Marine Drilling Riser Systems
(formerly API RP 2Q and RP 2K)

Includes guidelines for the design, selection, operation, and maintenance of marine riser systems for floating drilling operations. Organized as a reference for designers, for those who select system components, and for those who use and maintain this equipment. Pages: 48

1st Edition | November 1993 | Reaffirmed: August 1, 2001
Product Number: G07249 | Price: $105.00

Spec 16R ◆
Marine Drilling Riser Couplings
(replaces API RP 2R)

Covers the design, rating, manufacturing, and testing of marine drilling riser couplings. Coupling capacity ratings are established to enable the grouping of coupling models according to their maximum stresses developed under specific levels of loading, regardless of manufacturer or method of make-up. This specification relates directly to API 16Q, which covers the design, selection, and operation of the marine drilling riser system as a whole. Pages: 28

1st Edition | January 1997 | Effective Date: June 1, 1997
Product Number: G16R01 | Price: $94.00

Spec 16RCD ◆
Drill Through Equipment—Rotating Control Devices

Formulated to provide for the availability of safe and functionally interchangeable rotating control devices (RCDs) utilized in air drilling, drilling operations for oil and gas, and in geothermal drilling operations. Technical content provides requirements for design, performance, materials, tests and inspection, welding, marking, handling, storing, and shipping. This specification does not apply to field use or fieldtesting of RCDs. Critical components are those parts having requirements specified in this document. Pages: 71

1st Edition | February 2005 | Product Number: G16RCD01 | Price: $146.00

RP 16ST
Coiled Tubing Well Control Equipment Systems

Addresses coiled tubing well control equipment assembly and operation as it relates to well control practices. Industry practices for performing well control operations using fluids for hydrostatic pressure balance are not addressed in this recommended practice. This document covers well control equipment assembly and operation used in coiled tubing intervention and coiled tubing drilling applications performed through:

- christmas trees constructed to standards stipulated in API 6A and/or API 11IW;
- a surface flow head or surface test tree constructed to standards stipulated in API 6A;
- drill pipe or workstrings with connections manufactured in accordance with API Spec 7 and/or API 5CT. Pages: 75

1st Edition | March 2009 | Product Number: G16ST01 | Price: $140.00

RP 53
Blowout Prevention Equipment Systems for Drilling Operations

Provides information that can serve as a guide for installation and testing of blowout prevention equipment systems on land and marine drilling rigs (barge, platform, bottom-supported, and floating). Pages: 81

3rd Edition | March 1997 | Reaffirmed: September 1, 2004
Product Number: G53003 | Price: $122.00

RP 59
Recommended Practice for Well Control Operations

Provides information that can serve as a voluntary industry guide for safe well control operations. This publication is designed to serve as a direct field aid in well control and as a technical source for teaching well control principles. This publication establishes recommended operations to retain pressure control of the well under pre-kick conditions and recommended practices to be utilized during a kick. It serves as a companion to API RP 53, *Recommended Practice for Blowout Prevention Equipment Systems for Drilling Wells* and API RP 64, *Recommended Practice for Diverter Systems Equipment and Operations*. Pages: 92

2nd Edition | May 2006 | Product Number: G59002 | Price: $118.00

RP 64
Diverter Systems Equipment and Operations

Covers surface and subsea diverter systems and components, including design, controls, operating procedures, and maintenance for land, bottom-supported offshore, and floating offshore, and floating offshore installations. Pages: 61

2nd Edition | October 2001 | Reaffirmed: March 1, 2007
Product Number: G64002 | Price: $103.00

SUBSEA PRODUCTION SYSTEMS

RP 17A/ISO 13628-1:2005
Design and Operation of Subsea Production Systems—General Requirements and Recommendations
Petroleum and natural gas industries—Design and operation of subsea production systems—Part 1: General requirements and recommendations

Provides guidelines for the design, installation, operation, repair, and decommissioning of subsea production systems. The elements of subsea production systems included are wellheads (both subsea and mudline casing suspension systems) and trees; pipelines and end connections; controls, control lines and control fluids; templates and manifolds; and production riser (both rigid and flexible). Other sections cover operations, quality assurance, materials, and corrosion. This is intended as an umbrella document to govern other parts of the subsea document suite of standards dealing with more detailed requirements for the subsystems which typically form part of a subsea production system. However, in some areas (e.g. system design, structures, manifolds, lifting devices, and color and marking) more detailed requirements are included herein, as these subjects are not covered in a subsystem standard. The complete subsea production system comprises several subsystems necessary to produce hydrocarbons from one or more subsea wells and transfer them to a given processing facility located offshore (fixed, floating or subsea) or onshore, or to inject water/gas through subsea wells. Specialized equipment, such as split trees and trees and manifolds in atmospheric chambers, are not specifically discussed because of their limited use. However, the information presented is applicable to those types of equipment.

This edition of RP 17A is the identical national adoption of ISO 13628-1:2005, *Petroleum and natural gas industries—Design and operation of subsea production systems—Part 1: General requirements and recommendations.* Pages: 232

4th Edition | January 2006 | Product Number: GX17A04 | Price: $176.00

RP 17B/ISO 13628-11:2007
Recommended Practice for Flexible Pipe
Petroleum and natural gas industries—Design and operation of subsea production systems—Part 11: Flexible pipe systems for subsea and marine riser applications

Provides guidelines for the design, analysis, manufacture, testing, installation and operation of flexible pipes and flexible pipe systems for onshore, subsea and marine applications. This RP supplements API Specs 17J and 17K, which specify minimum requirements for the design, material selection, manufacture, testing, marking and packaging of unbonded and

bonded flexible pipe, respectively. This RP applies to flexible pipe assemblies, consisting of segments of flexible pipe body with end fittings attached to both ends. Both bonded and unbonded pipe types are covered. In addition, this RP applies to flexible pipe systems, including ancillary components. The applications covered by this RP are sweet- and sour-service production, including export and injection applications. This RP applies to both static and dynamic flexible pipe systems used as flowlines, risers and jumpers. This RP does cover, in general terms, the use of flexible pipes for offshore loading systems. This RP does not cover flexible pipes for use in choke and kill lines or umbilical and control lines.

This edition of RP 17B is the identical national adoption of ISO 13628-11:2007, *Petroleum and natural gas industries—Design and operation of subsea production systems—Part 11: Flexible pipe systems for subsea and marine riser applications.* Pages: 213

4th Edition | July 2008 | Product Number: GX17B04 | Price: $201.00

RP 17C/ISO 13628-3:2000

Recommended Practice on TFL (Through Flowline) Systems

Petroleum and natural gas industries—Design and operation of subsea production systems—Part 3: Through flow line (TFL) systems

Presents recommendations for designing, fabricating, and operating TFL (through flowline) equipment. Procedures and guidelines presented are for hydraulic servicing of downhole equipment, subsea tree and tubing hanger, and pipelines and equipment within the pipelines. This document primarily addresses TFL systems for offshore, subsea applications but it may also be used in other applications such as highly-deviated wells or horizontally-drilled wells. Subsea separation, boosting, metering and downhole pumps are outside the scope of this document.

This edition of 17C is the identical national adoption of ISO 13628-3:2000, *Petroleum and natural gas industries—Design and operation of subsea production systems—Part 3: Through flow line (TFL) systems.* Pages: 67

2nd Edition | September 2002 | Reaffirmed: February 23, 2010
Product Number: GX17C02 | Price: $121.00

Spec 17D ◆

Subsea Wellhead and Christmas Tree Equipment

(includes Supplement 1, dated March 1, 1993 and Supplement 2, dated June 1996; Effective date: August 1, 1996)

Provides the specification for safe, dimensionally and functionally interchangeable subsea wellhead, mudline, and tree equipment. Technical content includes requirements for performance, design, materials, testing, inspection, welding, marking, handling, storing, and shipping. The technical content provides requirements for performance, design, materials, testing, inspection, welding, marking, handling, storing and shipping. Critical components are those parts having requirements specified in this document. Rework and repair of used equipment are beyond the scope of this specification. Pages: 116

1st Edition | October 1992 | Reaffirmed: November 30, 2003
Product Number: G07265 | Price: $128.00

Spec 17E ◆

Specification for Subsea Umbilicals

Specifies requirements and gives recommendations for the design, material selection, manufacture, design verification, testing, installation and operation of subsea control systems, chemical injection, gas lift, utility and service umbilicals and associated ancillary equipment for the petroleum and natural gas industries. This also applies to umbilicals containing electrical conductors, optical fibres, thermoplastic hoses and metallic tubes, either alone or in combination; and applies to umbilicals that are for static or dynamic service, and with routings of surface-surface, surface-subsea and subsea-subsea. Pages: 105

3rd Edition | July 2003 | Effective Date: December 1, 2003
Product Number: GX17E03 | Price: $171.00

Spec 17F/ISO 13628-6:2006 ◆

Specification for Subsea Production Control Systems

Petroleum and natural gas industries—Design and operation of subsea production systems—Part 6: Subsea production systems

Applicable to design, fabrication, testing, installation and operation of subsea production control systems. 17F covers surface control system equipment, subsea-installed control system equipment and control fluids. This equipment is utilized for control of subsea production of oil and gas and for subsea water and gas injection services. Where applicable, this specification may be used for equipment on multiple-well applications. This document establishes design standards for systems, subsystems, components and operating fluids in order to provide for the safe and functional control of subsea production equipment. It contains various types of information related to subsea production control systems that includes: informative data that provide an overview of the architecture and general functionality of control systems for the purpose of introduction and information; basic prescriptive data that shall be adhered to by all types of control system; selective prescriptive data that are control-system-type sensitive and shall be adhered to only when they are relevant; and optional data or requirements that need be adopted only when considered necessary either by the purchaser or the vendor. In view of the diverse nature of the data provided, control system purchasers and specifiers are advised to select from this document only the provisions needed for the application at hand. Rework and repair of used equipment are beyond the scope of this specification.

This edition of Spec 17F is the identical national adoption of ISO 13628-6:2006, *Petroleum and natural gas industries—Design and operation of subsea production systems—Part 6: Subsea production systems*. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 58

2nd Edition | December 2006 | Effective Date: June 15, 2007
Product Number: GX17F02 | Price: $190.00

RP 17G/ISO 13628-7:2005

Recommended Practice for Completion/Workover Riser Systems

Petroleum and natural gas industries—Design and operation of subsea production systems—Part 7: Workover/Completion riser systems

Gives requirements and recommendations for the design, analysis, materials, fabrication, testing and operation of subsea completion/workover (C/WO) riser systems run from a floating vessel. Intended to serve as a common reference for designers, manufacturers and operators/users, thereby reducing the need for company specifications. This document is intended to serve as a common reference for designers, manufacturers and operators/users, thereby reducing the need for company specifications. This recommended practice is limited to risers, manufactured from low alloy carbon steels. Risers fabricated from special materials such as titanium, composite materials and flexible pipes are beyond the scope of this document. Specific equipment covered is listed as follows: riser joints; connectors; workover control systems; surface flow trees; surface tree tension frames; lower workover riser packages; lubricator valves; retainer valves; subsea test trees; shear subs; tubing hanger orientation systems; swivels; annulus circulation hoses; riser spiders; umbilical clamps; handling and test tools; and tree cap running tools. Associated equipment not covered includes: tubing hangers; internal and external tree caps; tubing hanger running tools; surface coiled tubing units; surface wireline units; and surface tree kill and production jumpers.

This edition of rp 17G is the identical national adoption of ISO 13628-7:2005, *Petroleum and natural gas industries—Design and operation of subsea production systems—Part 7: Workover/Completion riser systems.* Pages: 242

2nd Edition | July 2006 | Product Number: GX17G02 | Price: $176.00

RP 17H/ISO 13628-8:2002

Recommended Practice for Remotely Operated Vehicles (ROV) Interfaces on Subsea Production Systems

Petroleum and natural gas industries—Design and operation of subsea production systems—Part 8: Remotely Operated Vehicles (ROV) interfaces on subsea production systems

Gives functional requirements and guidelines for ROV interfaces on subsea production systems for the petroleum and natural gas industries. It is applicable to both the selection and use of ROV interfaces on subsea production equipment, and provides guidance on design as well as the operational requirements for maximizing the potential of standard equipment and design principles. The auditable information for subsea systems it offers will allow interfacing and actuation by ROV-operated systems, while the issues it identifies are those that have to be considered when designing interfaces on subsea production systems. The framework and detailed specifications set out will enable the user to select the correct interface for a specific application.

This edition of RP 17H is the identical national adoption of ISO 13628-8:2002, *Production Systems Petroleum and natural gas industries—Design and operation of subsea production systems—Part 8: Remotely Operated Vehicles (ROV) interfaces on subsea production systems*. Pages: 69

1st Edition | July 2004 | Reaffirmed: January 8, 2009
Product Number: GX17H04 | Price: $123.00

Spec 17J/ISO 13628-2:2006 ◆

Specification for Unbonded Flexible Pipe

Petroleum and natural gas industries—Design and operation of subsea production systems—Part 2: Flexible pipe systems for subsea and marine applications

Defines the technical requirements for safe, dimensionally and functionally interchangeable flexible pipes that are designed and manufactured to uniform standards and criteria. Minimum requirements are specified for the design, material selection, manufacture, testing, marking and packaging of flexible pipes, with reference to existing codes and standards where applicable. See API RP 17B for guidelines on the use of flexible pipes and ancillary components. This Spec applies to unbonded flexible pipe assemblies, consisting of segments of flexible pipe body with end fittings attached to both ends. This Spec does not cover flexible pipes of bonded structure. This Spec does not apply to flexible pipe ancillary components. Guidelines for bend stiffeners and bend restrictors are given in Annex B. This Spec does not apply to flexible pipes that include nonmetallic tensile armour wires. Pipes of such construction are considered as prototype products subject to qualification testing. The applications addressed by this document are sweet and sour service production, including export and injection applications. Production products include oil, gas, water and injection chemicals. This Spec applies to both static and dynamic flexible pipes used as flowlines, risers and jumpers. This Spec does not apply to flexible pipes for use in choke-and-kill line applications.

This edition of Spec 17J is the identical national adoption of ISO 13628-2:2006, *Petroleum and natural gas industries—Design and operation of subsea production systems—Part 2: Flexible pipe systems for subsea and marine applications*. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 73

3rd Edition | July 2008 | Effective Date: January 1, 2009
Product Number: GX17J03 | Price: $124.00

Spec 17K/ISO 13628-10:2005 ◆

Specification for Bonded Flexible Pipe

Petroleum and natural gas industries—Design and operation of subsea production systems—Part 10: Specification for bonded flexible pipe

Defines the technical requirements for safe, dimensionally and functionally interchangeable bonded flexible pipes that are designed and manufactured to uniform standards and criteria. Minimum requirements are specified for the design, material selection, manufacture, testing, marking and packaging of bonded flexible pipes, with reference to existing codes and standards where applicable. This document applies to bonded flexible pipe assemblies, consisting of segments of flexible pipe body with end fittings attached to both ends. It does not cover flexible pipes of unbonded structure or to flexible pipe ancillary components. This document can be applied to flexible pipes that include non-metallic reinforcing layers, though no effort was made to address the specific and unique technological aspects of this product.

This edition of Spec 17K is the identical national adoption of ISO 13628-10:2005, *Petroleum and natural gas industries—Design and operation of subsea production systems—Part 10: Specification for bonded flexible pipe.* This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 74

2nd Edition | November 2005 | Effective Date: May 1, 2006
Product Number: GX17K02 | Price: $146.00

RP 17M/ISO 13628-9:2000

Recommended Practices on Remotely Operated Tool (ROT) Intervention Systems

Petroleum and natural gas industries—Design and operation of subsea production systems—Part 9: Remotely operated tool (ROT) intervention system

Provides functional requirements and recommendations for ROT intervention systems and interfacing equipment on subsea production systems for the petroleum and natural gas industries. This RP does not cover manned intervention and ROV-based intervention systems (e.g. for tie-in of sealines and module replacement). Vertical wellbore intervention, internal flowline inspection, tree running and tree running equipment are also excluded from this RP.

This edition of RP 17M is the identical national adoption of ISO 13628-9:2000, *Petroleum and natural gas industries—Design and operation of subsea production systems—Part 9: Remotely operated tool (ROT) intervention system.* Pages: 24

1st Edition | April 2004 | Reaffirmed: January 8, 2009
Product Number: GG17M1 | Price: $108.00

TR 17TR1

Evaluation Standard for Internal Pressure Sheath Polymers for High Temperature Flexible Pipes

Defines the methodology and test procedures necessary for the evaluation of polymeric materials suitable for use as the internal pressure sheath of an unbonded flexible pipes in high temperature applications. It describes the processes by which the critical material properties, both static and dynamic, can be measured and evaluated against relevant performance criteria. This document relates primarily to the properties necessary for an internal pressure sheath required for oil and gas production. These are most relevant to high temperature applications. Only thermoplastic materials are considered for the internal pressure sheath. Elastomeric materials, which are used in bonded flexible pipes, are not considered in this document. Pages: 47

1st Edition | March 2003 | Product Number: G17TR11 | Price: $128.00

TR 17TR2

The Aging of PA-11 Inflexible Pipes

Provides comprehensive guidance on materials and pipe issues regarding the use and operation of PA-11 in flexible pipe applications, and concentrates on the use of PA-11 in the internal sheath of flexible pipes. The collective goal of this document is to prevent failure of the internal pressure sheath, as a result of ageing and associated loss of mechanical properties, by determining and disseminating the necessary scientific and practical information. Pages: 31

1st Edition | June 2003 | Product Number: G17TR21 | Price: $98.00

TR 17TR3
An Evaluation of the Risks and Benefits of Penetrations in Subsea Wellheads below the BOP Stack

Provides an evaluation of the risks and benefits of allowing penetrations in subsea wellheads below the blowout preventer (BOP) stack so annuli other than the production tubing (commonly referred to as the "A" annulus) could be monitored. Current industry standards (API Spec 17D and ISO 13628-4) for the design of subsea wellheads prohibit penetrations below the (BOP) stack. In contrast, US regulations (30 *CFR* 250.517) require that all annuli be monitored for sustained casing pressure and that every occurrence of sustained casing pressure be reported immediately. The study concludes that the risks outweigh the benefits since the risk of maintaining the pressure barrier using a wellhead with penetrations is approximately 2.5 times that of a system without penetrations. The scope of this study is limited to completed subsea wells in the Gulf of Mexico (GOM). The risks were evaluated using fault tree analysis for three systems:

- wellhead system without penetrations,
- wellhead system with one penetration and
- wellhead system with two penetrations. Pages: 123

1st Edition | November 2004 | Product Number: G17TR31 | Price: $128.00

COMPLETION EQUIPMENT

Spec 11V1 ◆
Specification for Gas Lift Equipment

Covers the design, manufacture, and testing of gas lift valves, reverse flow (check) valves, orifice valves, dummy valves and the WRVM's used as a receiver for these valves or other devices used to enhance oil well production or treat oil or gas wells. This specification was formulated to provide consistently manufactured equipment to a predictable level of quality. Technical content includes requirements for materials, tests and inspecting, welding, marking, storing, and shipping. This specification is intended as a quality-based specification and does not assure dimensional interchangeability between manufacturers. Pages: 37

2nd Edition | February 1995 | Reaffirmed: March 31, 2008
Product Number: G11V12 | Price: $111.00

Spec 11D1/ISO 14310:2008 ◆■
Packers and Bridge Plugs
Petroleum and natural gas industries—Downhole equipment—Packers and bridge plugs

Provides requirements and guidelines for packers and bridge plugs as defined herein for use in the petroleum and natural gas industry. This specification provides requirements for the functional specification and technical specification, including design, design verification and validation, materials, documentation and data control, repair, shipment, and storage. In addition, products covered by this specification apply only to applications within a conduit. Installation and maintenance of these products are outside the scope of this specification.

This edition of API Spec 11D1 is the identical adoption of ISO 14310:2008, *Petroleum and natural gas industries—Downhole equipment—Packers and bridge plugs* with the addition of an API Monogram Annex. Pages: 30

2nd Edition | July 2009 | Effective Date: January 1, 2010
Product Number: GG11D12 | Price: $95.00

RP 11V10
Recommended Practices for Design and Operation of Intermittent and Chamber Gas-Lift Wells and Systems

Presents guidelines and recommended practices for the design and operation of intermittent, chamber, and plunger gas-lift systems. The document is formatted with Section 1 presenting a summary of the primary guidelines and recommended practices for these methods of artificial lift for use by practicing engineers and field operators. Sections 2 to 7 are designed to provide more detailed information, including theoretical background for many of the guidelines and recommended practices. These sections are available for anyone, but are specifically intended for those who wish to gain a comprehensive understanding of the theory and practice of intermittent gas-lift. This document also contains three annexes. Annex A contains mathematical derivations and models of some of the most pertinent intermittent gas-lift calculations. Annex B contains a comprehensive example of an intermittent gas-lift design. Annex C describes how to use the Field Units Calculator and SI Units Calculator. These are two spreadsheets that are part of this RP. Pages: 165

1st Edition | June 2008 | Product Number: G11V1001 | Price: $173.00

RP 11V2
Gas Lift Valve Performance Testing

Covers the test procedures for flow performance testing of wireline-retrievable and tubing-retrievable IPO (injection pressure operated), and PPO (production pressure operated) gas lift valves. Pages: 45

2nd Edition | March 2001 | Reaffirmed: March 31, 2008
Product Number: G11V22 | Price: $100.00

RP 11V5
Operation, Maintenance, Surveillance and Troubleshooting of Gas-Lift Installations

Assists gas-lift system operators, analysts, technicians, engineers, and others in understanding how to effectively plan, operate, maintain, troubleshoot and provide surveillance for gas-lift systems and gas-lift wells. These recommended practices discuss continuous gas-lift with injection in the casing/tubing annulus and production up the tubing. Annular flow gas-lift (injection down the tubing and production up the annulus), dual gas-lift (two tubing strings in the same casing), and intermittent gas-lift are mentioned; however, most of the discussion focuses on conventional continuous gas-lift. Pages: 123

3rd Edition | June 2008 | Product Number: G11V53 | Price: $150.00

RP 11V6
Design of Continuous Flow Gas Lift Installations Using Injection Pressure Operated Valves

Intended to set guidelines for continuous flow gas lift installation designs using injection pressure operated valves. The assumption is made that the designer is familiar with and has available data on the various factors that affect a design.

2nd Edition | July 1999 | Reaffirmed: March 31, 2008
Product Number: G11V62 | Price: $144.00

RP 11V7
Recommended Practice for Repair, Testing and Setting Gas Lift Valves

Applies to repair, testing, and setting gas lift valves and reverse flow (check) valves. It presents guidelines related to the repair and reuse of valves; these practices are intended to serve both repair shops and operators. The commonly used gas pressure-operated bellows valve is also covered. Other valves, including bellows charged valves in production pressure (fluid) service should be repaired according to these guidelines. Pages: 22

2nd Edition | June 1999 | Reaffirmed: March 31, 2008
Product Number: G11V72 | Price: $105.00

RP 11V8
Recommended Practice for Gas Lift System Design and Performance Prediction

The primary purpose of this RP is to emphasize gas lift as a system and to discuss methods used to predict its performance. Information must be gathered and models validated prior to a system design, which must precede wellbore gas lift mandrel and valve design. The subsurface and surface components of the system must be designed together to enhance the strengths of each and to minimize the constraints. Pages: 79

1st Edition | September 2003 | Reaffirmed: March 31, 2008
Product Number: G11V81 | Price: $115.00

RP 19B ◆
Evaluation of Well Perforators
(formerly RP 43)

Describes standard procedures for evaluating the performance of perforating equipment so that representations of this performance may be made to the industry under a standard practice. Also contains tests to gauge performance under the following conditions:

- ambient temperature and pressure,
- simulated wellbore (stressed Berea Sandstone),
- elevated temperature.

This edition also introduces a procedure to quantify the amount of debris that comes out of the perforating gun during detonation. Pages: 42

2nd Edition | September 2006 | Product Number: G019B2 | Price: $118.00

RP 19C/ISO 13503-2:2006
Recommended Practice for Measurement of Properties of Proppants Used in Hydraulic Fracturing and Gravel-packing Operations
Petroleum and natural gas industries—Completion fluids and materials—Part 2: Measurement of properties of proppants used in hydraulic fracturing and gravel-packing operations

Provides standard testing procedures for evaluating proppants used in hydraulic fracturing and gravel packing operations. The objective of this recommended practice is to provide a consistent methodology for testing performed on hydraulic fracturing and/or gravel packing proppants. These procedures have been developed to improve the quality of proppants delivered to the well site. They are for use in evaluating certain physical properties used in hydraulic fracturing and gravel packing operations. These tests should enable users to compare the physical characteristics of various proppants tested under the described conditions and to select materials useful for hydraulic fracturing and gravel packing operations.

This edition of RP 19C is the identical national adoption of ISO 13503-2:2006, *Petroleum and natural gas industries—Completion fluids and materials—Part 2: Measurement of properties of proppants used in hydraulic fracturing and gravel-packing operations* and replaces RP 56 and RP 58. Pages: 30

1st Edition | May 2008 | Product Number: GX19C01 | Price: $109.00

RP 19D/ISO 13503-5:2006
Recommended Practice for Measuring the Long-term Conductivity of Proppants
Petroleum and natural gas industries—Completion fluids and materials—Part 5: Procedures for measuring the long-term conductivity of proppants

Provides standard testing procedures for evaluating proppants used in hydraulic fracturing and gravel-packing operations. The proppants mentioned in this publication refer to sand, ceramic media, resin coated proppants, gravel packing media, and other materials used for hydraulic fracturing and gravel-packing operations. The objective of RP 19D is to provide consistent methodology for testing performed on hydraulic-fracturing and/or gravel-packing proppants. It is not intended for use in obtaining absolute values of proppant pack conductivities under downhole reservoir conditions. The tests and test apparatus herein have been developed to establish standard procedures and conditions for use in evaluating the long-term conductivity of various hydraulic fracture proppant materials under laboratory conditions. This procedure enables users to compare the conductivity characteristics under the specifically described test conditions. The test results can aid users in comparing proppant materials for use in hydraulic fracturing operations.

This is the identical national adoption of ISO 13503-5:2006, *Petroleum and natural gas industries—Completion fluids and materials—Part 5: Procedures for measuring the long-term conductivity of proppants* and replaces RP 61. Pages: 24

1st Edition | March 2008 | Product Number: GX19D01 | Price: $103.00

RP 19G9 ■
Design, Operation, and Troubleshooting of Dual Gas-lift Wells

This document provides recommended practices for the design, operation, optimization, and troubleshooting of dual gas-lift wells. RP 19G9 also containes suggestions on practices that should be avoided to minimize problems, inefficiencies, and poor economics that may be associated with ineffective dual gas-lift operations. Pages: 108

1st Edition | February 2010 | Product Number: G19G901 | Price: $138.00

Spec 20C ◆■
Closed Die Forgings for Use in the Petroleum and Natural Gas Industry

Specifies requirements and gives recommendations for the design, qualification, and production of closed-die forgings for use in API service components in the petroleum and natural gas industries when referenced by an applicable equipment standard or otherwise specified as a requirement for compliance. API 20C is applicable to equipment used in the oil and natural gas industries where service conditions warrant the use of closed-die forgings. Examples include pressure containing or load-bearing components. This standard establishes requirements for four forging specification levels (FSL). These FSL designations define different levels of forged product technical, quality and qualification requirements. Pages: 18

1st Edition | October 2009 | Effective Date: March 31, 2010
Product Number: G20C01 | Price: $71.00

RP 31A
Standard Form for Hardcopy Presentation of Downhole Well Log Data

Provides an improved standard format for hardcopy presentation of downhole well log data. Standardizing the log form and data presentation allows the user to more easily combine a broad range of log data in order to interpret well status and performance. Pages: 18

1st Edition | August 1997 | Reaffirmed: September 1, 2004
Product Number: G31A01 | Price: $94.00

RP 41
Standard Procedure for Presenting Performance Data on Hydraulic Fracturing Equipment

Provides a standard procedure for measuring, reporting, and certifying the hydraulic horsepower rating of pumping units used in well cementing and fracturing services. It is applicable to any type of pumping unit regardless of components such as engines, transmissions, and fracturing pumps. Pages: 8

2nd Edition | February 1995 | Reaffirmed: June 1, 2000
Product Number: G41002 | Price: $73.00

RP 43
Evaluation of Well Perforators

Describes test procedures for the evaluation of perforators under surface conditions; and the evaluation of the physical and flow characteristics of perforations obtained under temperature and pressure. A form for certification of data is included as a part of the recommended testing procedures.

5th Edition | January 1991 | Product Number: G08600 | Price: $67.00

DRILLING AND PRODUCTION OPERATIONS: RECOMMENDED OPERATING PRACTICES

RP 44
Sampling Petroleum Reservoir Fluids

Proper management of production from a natural gas or petroleum reservoir can maximize the recovery of the hydrocarbon fluids (gas and oil) originally in the reservoir. Developing proper management strategies requires accurate knowledge of the characteristics of the reservoir fluid. Practices are recommended herein for obtaining samples of the reservoir fluid, from which the pertinent properties can be determined by subsequent laboratory tests. Pages: 49

2nd Edition | April 2003 | Product Number: G44002 | Price: $100.00

RP 45
Analysis of Oilfield Waters

Provides analysis methods for the determination of dissolved and dispersed components in oilfield waters (produced water, injected water, aqueous workover fluids, and stimulation fluids). Also includes the applications of oilfield water analyses; the proper collection, preservation, and labeling of field samples; a description of the various analytical methods available, including information regarding interferences, precision, accuracy, and detection limits; as well as the appropriate reporting formats for analytical results. Pages: 60

3rd Edition | August 1998 | Reaffirmed: September 1, 2004
Product Number: G45003 | Price: $137.00

RP 50
Natural Gas Processing Plant Practices for Protection of the Environment

Assists gas plant operators in understanding their environmental responsibilities. It is intended to be used primarily by environmental, engineering, and operations personnel; and by management involved in building, maintaining, modifying, and operating gas processing plants. Operations within the scope of this standard include natural gas processing and associated gas compression facilities. This publication begins with initial plant planning, permitting, and construction and ends with plant closure and site restoration procedures. General guidelines are provided to be used at gas plant locations to develop site-specific environmental programs. Pages: 23

2nd Edition | December 1995 | Reaffirmed: March 1, 2007
Product Number: G50002 | Price: $105.00

RP 51
Onshore Oil and Gas Production Practices for Protection of the Environment

Provides environmentally sound practices to promote protection of the environment in domestic onshore oil and gas production operations. Production facilities, including produced water handling facilities, are covered. Coverage begins with design and construction of access roads and well locations and carries through to abandonment and site restoration activities. Pages: 17

3rd Edition | March 2001 | Reaffirmed: March 1, 2007
Product Number: G51003 | Price: $73.00

RP 51R
Environmental Protection for Onshore Oil and Gas Production Operations and Leases

Provides environmentally sound practices, including reclamation guidelines, for domestic onshore oil and gas production operations. It is intended to be applicable to contractors as well as operators. Facilities within the scope of this document include all production facilities, including produced water handling facilities. Offshore and arctic areas are beyond the scope of this document. Operational coverage begins with the design and construction of access roads and well locations, and includes reclamation, abandonment, and restoration operations. Gas compression for transmission purposes or production operations, such as gas lift, pressure maintenance, or enhanced oil recovery (EOR) is included. Annex A provides guidance for a company to consider as a "good neighbor." Pages: 35

1st Edition | July 2009 | Product Number: G51R01 | Price: $50.00

RP 52
Land Drilling Practices for Protection of the Environment

Provides guidelines to promote the protection of the environment in land drilling operations. Pages: 40

2nd Edition | July 1995 | Reaffirmed: June 1, 2000
Product Number: G52002 | Price: $111.00

RP 63
Evaluation of Polymers Used in Enhanced Oil Recovery Operations

Describes test procedures and equipment that can be used to evaluate and compare polymer performance under standard laboratory conditions. These recommended tests are for qualitative comparison of performance and general screening of polymers under specific conditions. Suggested procedures are presented for sample preparation; evaluation of polymer solution rheology and flow through porous media; filterability testing of polymer solutions; determining concentration of polymers in solutions; and evaluation of polymer retention. Pages: 74

1st Edition | June 1990 | Reaffirmed: June 1, 2000
Product Number: G63001 | Price: $137.00

RP 65
Cementing Shallow Water Flow Zones in Deep Water Wells

This document is the compilation of technology and practices used by many operators drilling wells in deep water. It is meant to highlight key parameters for increasing the chance of successfully drilling and cementing casings where there is a risk of shallow water flow and to discuss options that are available. Pages: 44

1st Edition | September 2002 | Product Number: G56001 | Price: $117.00

RP 66
Exploration and Production Data Digital Interchange (Version 2.00)

Presents an industry standard for recording well log data on magnetic tape, as well as other storage media. Defines data organization on two levels, on the logical format level and on the physical format level. Retains the essential features of RP 66, Version 1.00, and is completely upward compatible; that is, any data recorded under Version 1.00 can be translated into Version 2.00 format.

2nd Edition | June 1996 | Product Number: G66002 | Price: $114.00

RP 68
Well Servicing and Workover Operations Involving Hydrogen Sulfide

Addresses personnel training, personnel protective equipment, contingency planning and emergency procedures. Also included are classification of locations, materials and equipment, operations, rig practices, special operations, offshore operations, characteristics of hydrogen sulfide and sulfur dioxide, and evaluation and selection of hydrogen sulfide monitoring equipment.

1st Edition | January 1998 | Product Number: G68001 | Price: $73.00

RP 80
Guidelines for the Definition of Onshore Gas Gathering Lines

Developed by an industry coalition that included representatives from over 20 petroleum industry associations, provides a functional description of onshore gas gathering pipelines for the sole purpose of providing users with a practical guide for determining the application of the definition of gas gathering in the federal Gas Pipeline Safety Standards, 49 *CFR* Part 192, and state programs implementing these standards. Pages: 53

1st Edition | April 2000 | Reaffirmed: March 1, 2007
Product Number: G80001 | Price: $121.00

RP 90
Annular Casing Pressure Management for Offshore Wells

Intended to serve as a guide for managing annular casing pressure in offshore wells. This guide is meant to be used for offshore wells that exhibit annular casing pressure, including thermal casing pressure, sustained casing pressure (SCP) and operator-imposed pressure. Covers monitoring, diagnostic testing, the establishment of a maximum allowable wellhead operating pressure (MAWOP) and documentation of annular casing pressure for the various types of wells that occur offshore. Included also is a discussion of risk assessment methodologies that can be used for the evaluation of individual well situations where the annular casing pressure is not within the MAWOP guidelines. Provides guidelines in which a broad range of casing annuli that exhibit annular pressure can be managed in a routine fashion while maintaining an acceptable level of risk. Pages: 84

1st Edition | August 2006 | Product Number: G09001 | Price: $176.00

RP 92U
Underbalanced Drilling Operations

The purpose of these recommended practices is to provide information that can serve as a guide for planning, installation, operation and testing of underbalanced drilling equipment systems on land and offshore drilling rigs [barge, platform, bottom-supported, and floating with surface blowout preventers (BOP) installed] thereby ensuring consideration of personnel safety, public safety, integrity of the underbalanced drilling (UBD) equipment, and preservation of the environment for onshore and offshore UBD operations (including tripping of drill string). Pages: 72

1st Edition | November 2008 | Product Number: G92U01 | Price: $101.00

DRILLING AND PRODUCTION OPERATIONS: TRAINING

Introduction to Oil and Gas Production
(Book 1 in the Vocational Training Series)

Serves as a primer for oil and gas operations. It covers the origins and accumulation of oil and gas, the well, well treatment and wellhead, artificial lift, well testing, separation, treatment and storage, gauging and metering, production, offshore production and structures, corrosion, enhanced recovery, production personnel, tools and equipment, pipe, valves and fittings, reports and records, state and federal regulations, environmental, health and safety concerns, economic considerations, and future trends. Pages: 120

5th Edition | June 1996 | Reaffirmed: March 1, 2007
Product Number: GVT015 | Price: $152.00

Subsurface Salt Water Injection and Disposal
(Book 3 in the Vocational Training Series)

A handbook for the planning, installation, operation, and maintenance of subsurface disposal systems. Design criteria and formulas are given for gathering systems, treating plants, and injection facilities. Alternative equipment and methods are discussed and illustrated. Economic considerations are presented. Pages: 47

3rd Edition | January 1995 | Reaffirmed: March 1, 2007
Product Number: GVT033 | Price: $94.00

Wireline Operations and Procedures
(Book 5 in the Vocational Training Series)

A handbook outlining to operators of oil and gas wells what applications are possible with wireline tools and equipment. Also a guide for field personnel. Surface equipment, service tools (standard and special), and subsurface equipment (both permanent and removable) are described and illustrated. Their various applications are included. Also presented is a general discussion of special problems which wireline operations and procedures may serve to eliminate, minimize, or control, and methods by which this may be accomplished. Pages: 60

3rd Edition | January 1994 | Reaffirmed: March 1, 2007
Product Number: GVT053 | Price: $118.00

Gas Lift
(Book 6 in the Vocational Training Series)

Familiarizes field personnel with basic gas lift principles; operating procedures for adjusting, regulating, operating, and troubleshooting gas-lift equipment; and well conditions. Covers conventional practices and concepts. Illustrated with drawings of typical gas-lift installations and related equipment, as well as actual charts illustrating operation of and problems encountered in gas-lifted wells. Pages: 143

3rd Edition | January 1994 | Reaffirmed: March 1, 2007
Product Number: GVT063 | Price: $152.00

RP T-1
Orientation Programs for Personnel Going Offshore for the First Time

Serves as a guide to developing orientation standards and programs applicable to all employees and visitors going offshore. Orientation programs ensure that all new personnel know what is expected of them during their first trip offshore, as well as what they may expect to encounter during this trip. Employers have the option to institute broader procedures commensurate with their own policies and standards. Pages: 4

4th Edition | October 1995 | Reaffirmed: March 1, 2007
Product Number: GT1004 | Price: $57.00

RP T-2 ◆
Qualification Programs for Offshore Production Personnel Who Work with Safety Devices

Provides guidelines for the qualification of personnel engaged in installing, inspecting, testing, and routinely maintaining surface and subsurface devices that are used to insure safety and to prevent pollution during the production of oil and gas on offshore platforms. The guidelines provide expected candidate performance levels, instructional content and recommendations for testing. The guidelines are divided into instructional and testing phases. Pages: 3

2nd Edition | December 2001 | Reaffirmed: March 1, 2007
Product Number: GT7002 | Price: $57.00

RP T-4
Training of Offshore Personnel in Nonoperating Emergencies

Represents an industry guide for the training of workers who work offshore. It presents recommendations for training these personnel in handling nonoperating emergencies, such as fires, transportation emergencies, platform abandonment procedures, use of survival crafts, and water survival guidelines. Pages: 3

2nd Edition | November 1995 | Reaffirmed: June 1, 2000
Product Number: GT4002 | Price: $57.00

RP T-6
Recommended Practice for Training and Qualification of Personnel in Well Control Equipment and Techniques for Wireline Operations on Offshore Locations

Provides criteria for the qualification of wireline personnel in well control equipment operations and techniques. Although it does include recommendations for training wireline personnel on general rig well control equipment and theory, it should be noted that the main focus for training should be those operations using a lubricator as the primary well control mechanism. Wireline personnel classifications to which this RP is applicable are the Helper/Assistant and Operator/Supervisor. Pages: 2

1st Edition | October 2002 | Reaffirmed: March 1, 2007
Product Number: GT0601 | Price: $57.00

RP T-7
Training of Personnel in Rescue of Person in Water

Applies to personnel who work offshore. It represents an industry guide for training personnel in techniques for rescuing persons from the water and using survival devices. It broadly identifies rescue devices, describes their operations, and presents recommendations for training personnel. Training recommendations are designed to develop personnel rescue proficiency while minimizing an individual's exposure to injury or loss of life. Pages: 8

2nd Edition | October 1995 | Reaffirmed: March 1, 2007
Product Number: GT7002 | Price: $55.00

SPECIAL PUBLICATIONS

Community Matters: Community Outreach Guidance Manual for Exploration and Production Facilities

Provides a model community outreach program to help oil and natural gas industry E&P facilities improve their ties to their local communities. Community Matters offers a step-by-step guide for implementing a community outreach program and provides information on how to tailor outreach efforts to meet the needs of the facility and local community. Pages: 111

1st Edition | November 2000 | Product Number: G13660 | Price: $80.00

VOLUNTARY OPERATING AGREEMENTS AND BULLETINS

Bull D16
Suggested Procedure for Development of a Spill Prevention Control and Countermeasure Plan

The purpose of this document is to assist the petroleum industry in understanding the SPCC regulation in light of the latest rule (40 *CFR* Part 112) and to offer guidance for developing SPCC Plans wherever they are needed. Included is a template for developing SPCC plans (i.e. onshore excluding production; onshore oil production, oil drilling or workover; or offshore oil drilling, production or workover) in accordance with the regulation and guidance, instruction and clarification for completing each section of the template. The purpose of this rulemaking was to establish procedures, methods, and equipment to prevent and contain discharges of oil from non-transportation-related onshore and offshore facilities; thus preventing pollution of navigable waters of the United States. The development of this Bulletin was commissioned by API and performed by Response Management Associates, Inc. (RMA). The purchase of D16 includes; Bulletin D16, the Plan Template, and a CD-ROM with the Microsoft® Word version of the Plan Template.

3rd Edition | December 2002 | Product Number: GD1603
Price: $250.00 | Template only: Price: $92.00

HEALTH, ENVIRONMENT, AND SAFETY: EXPLORATION AND PRODUCTION SAFETY STANDARDS

API HF1 ■
Hydraulic Fracturing Operations—Well Construction and Integrity Guidelines

The purpose of this guidance document is to provide guidance and highlight industry recommended practices for well construction and integrity for wells that will be hydraulically fractured. The guidance provided here will help to ensure that shallow groundwater aquifers and the environment will be protected, while also enabling economically viable development of oil and natural gas resources. This document is intended to apply equally to wells in either vertical, directional, or horizontal configurations.

Maintaining well integrity is a key design principle and design feature of all oil and gas production wells. Maintaining well integrity is essential for the two following reasons.

1) To isolate the internal conduit of the well from the surface and subsurface environment. This is critical in protecting the environment, including the groundwater, and in enabling well drilling and production.

2) To isolate and contain the well's produced fluid to a production conduit within the well.

Although there is some variability in the details of well construction because of varying geologic, environmental, and operational settings, the basic practices in constructing a reliable well are similar. These practices are the result of operators gaining knowledge based on years of experience and technology development and improvement. These experiences and practices are communicated and shared via academic training, professional and trade associations, extensive literature and documents and, very importantly, industry standards and recommended practices. Pages: 24

1st Edition | October 2009 | Product Number: GHF101 | Price: $40.00
Free PDF available at www.api.org/Standards/epstandards

RP 49
Recommended Practice for Drilling and Well Service Operations Involving Hydrogen Sulfide

Recommendations set forth in this publication apply to oil and gas well drilling and servicing operations involving hydrogen sulfide. These operations include well drilling, completion, servicing, workover, downhole maintenance, and plug and abandonment procedures conducted with hydrogen sulfide present in the fluids being handled. Coverage of this publication is applicable to operations confined to the original wellbore or original total depth and applies to the selection of materials for installation or use in the well and in the well drilling or servicing operation(s). The presence of hydrogen sulfide in these operations also presents the possibility of exposure to sulfur dioxide from the combustion of hydrogen sulfide. Pages: 29

2nd Edition | May 2001 | Reaffirmed: March 1, 2007
Product Number: G04902 | Price: $85.00
Free PDF available at www.api.org/Standards/epstandards

RP 51R
Environmental Protection for Onshore Oil and Gas Production Operations and Leases

Provides environmentally sound practices, including reclamation guidelines, for domestic onshore oil and gas production operations. It is intended to be applicable to contractors as well as operators. Facilities within the scope of this document include all production facilities, including produced water handling facilities. Offshore and arctic areas are beyond the scope of this document. Operational coverage begins with the design and construction of access roads and well locations, and includes reclamation, abandonment, and restoration operations. Gas compression for transmission purposes or production operations, such as gas lift, pressure maintenance, or enhanced oil recovery (EOR) is included. Annex A provides guidance for a company to consider as a "good neighbor." Pages: 35

1st Edition | July 2009 | Product Number: G51R01 | Price: $50.00
Free PDF available at www.api.org/Standards/epstandards

RP 54
Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations

Includes procedures for promotion and maintenance of safe working conditions for employees engaged in rotary drilling operations and well servicing operations, including special services. Applies to rotary drilling rigs, well servicing rigs, and special services as they relate to operations on locations. Pages: 35

3rd Edition | August 1999 | Reaffirmed: March 1, 2007
Product Number: G54003 | Price: $121.00
Free PDF available at www.api.org/Standards/epstandards

RP 55
Conducting Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide

Covers recommendations for protection of employees and the public, as well as conducting oil and gas producing and gas processing plant operations where hydrogen sulfide is present in the fluids being produced. Pages: 40

2nd Edition | February 1995 | Reaffirmed: March 1, 2007
Product Number: G55002 | Price: $111.00
Free PDF available at www.api.org/Standards/epstandards

RP 67
Recommended Practice for Oilfield Explosives Safety

Applicable to explosives used in oil and gas well operations, more specifically, explosives used inside the wellborne. Guidance is provided for explosives transportation, on-site explosives loading and unloading operations, electrical wireline operations, tubing conveyed operations, self-contained activating tools, setting tools, sidewall sample taker tools, select fire perforating guns, and bullet perforating guns. Recommendations are presented regarding surface equipment and downhole equipment. Recommended training and minimum qualifications are presented for personnel who participate in handling and using explosives at the well site. Pages: 18

2nd Edition | May 2007 | Product Number: G09309 | Price: $82.00
Free PDF available at www.api.org/Standards/epstandards

RP 74
Recommended Practice for Occupational Safety for Onshore Oil and Gas Production Operation

Recommends practices and procedures for promoting and maintaining safe working conditions for personnel engaged in onshore oil and gas production operations, including special services. Pages: 23

1st Edition | October 2001 | Reaffirmed: March 1, 2007
Product Number: G74001 | Price: $59.00
Free PDF available at www.api.org/Standards/epstandards

RP 75
Development of a Safety and Environmental Management Program for Offshore Operations and Facilities

Provides guidance for use in preparing safety and environmental management programs (SEMP) for oil, gas, and sulphur operations and facilities located on the outer continental shelf (OCS). These guidelines are applicable to well drilling, servicing, and production; and pipeline facilities and operations that have the potential for creating a safety or environmental hazard at OCS platform sites. Eleven major program elements are included for application to these facilities and operations. Identification and management of safety and environmental hazards are addressed in design, construction, startup, operation, inspection, and maintenance of new, existing, and modified facilities Pages: 41

3rd Edition | May 2004 | Product Number: G07503 | Price: $86.00
Free PDF available at www.api.org/Standards/epstandards

RP 75L
Guidance Document for the Development of a Safety and Environmental Management System for Onshore Oil and Natural Gas Production Operation and Associated Activities

This publication was written to provide general information and guidance for the development of a safety and environmental management system (SEMS) for onshore oil and natural gas operations, including drilling, production, and well servicing activities. Although there is an extensive amount of information that has been developed on the topic of safety and environmental management systems, this document focuses on this industry sector to help foster continuous improvement in our industry's safety and environmental performance. It is recognized that many onshore oil and natural gas companies have effective SEMS in place; however, the intent of this document is to provide an additional tool that can assist these and especially other operators in taking the next step toward implementing a complete system at a pace that complements their business plan. For those who already have a mature SEMS in place, this document can be used for continuous improvement of the system. Pages: 12

1st Edition | October 2007 | Product Number: G75L01 | Price: $33.00
Free PDF available at www.api.org/Standards/epstandards

RP 76
Contractor Safety Management for Oil and Gas Drilling and Production Operations

Intended to assist operators, contractors, and subcontractors (third parties) in the implementation of a contractor safety program and improve the overall safety performance while preserving the independent contractor relationship. It is intended for the Upstream segment of the petroleum industry; however, since the Operator requirements and the contracted work are diverse, this publication may not be applicable to all operations at each company or to all contract work performed in those operations. Many oil and gas exploration and production companies contract for equipment and personnel services for a wide range of activities, including drilling production, well servicing, equipment repair, maintenance, and construction. Certain activities of Contractors have the potential to take place either Contractor and/or Operator personnel and/or equipment at risk. It is important that operations are carried out in a safe manner. Operators and contractors need to provide safe work places and to protect the safety of their work places and to protect the safety of their workforces and the general public. When they work together to improve safety, both benefit. Pages: 60

2nd Edition | October 2007 | Product Number: G07602 | Price: $55.00
Free PDF available at www.api.org/Standards/epstandards

HEALTH, ENVIRONMENT AND SAFETY: GENERAL

Achieving Common Sense Environmental Regulation: Oil and Gas Exploration & Production

Discusses proposals to achieve a balanced approach to environmental regulation of the oil and gas exploration and production industry that protects the environment as well or better than the current system, and does the job more efficiently. Pages: 36

May 1996 | Product Number: G13715 | Price: Free*

Exploration and Production: Protecting the Environment

Discusses work the E&P industry does to protect the environment while exploring for and producing oil and natural gas. Describes a number of innovative and socially responsible actions taken by exploration and production companies to minimize impacts to air, water, land and wildlife. This document is only available in a PDF format. Pages: 24

September 1997 | Product Number: G13650 | Price: Free*

Publ 4702
Technologies to Reduce Oil and Grease Content of Well Treatment, Well Completion, and Workover Fluids for Overboard Disposal

Technologies to Reduce Oil and Grease Content of Well Treatment, Well Completion, and Workover Fluids for Overboard Disposal Pages: 54

September 2002 | Product Number: I47020 | Price: $118.00

Bull E1
Generic Hazardous Chemical Category List and Inventory for the Oil and Gas Exploration and Production Industry
(Superfund Amendments and Reauthorization Act of 1986, Emergency Planning and Community Right-to-Know Act) (Includes Errata dated September 1991)

Under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986, owners and operators of oil and gas exploration and production facilities must provide to state and local emergency response agencies information on hazardous chemicals they produce or use. This bulletin provides a simplified means of compliance with these regulations. Pages: 86

2nd Edition | December 1990 | Reaffirmed: June 1, 2000
Product Number: G11000 | Price: $137.00

Bull E3
Well Abandonment and Inactive Well Practices for U.S. Exploration and Production Operations, Environmental Guidance Document

Addresses the environmental concerns related to well abandonment and inactive well practices. The primary environmental concerns are protection of freshwater aquifers from fluid migration; and isolation of hydrocarbon production and water injection intervals. Additional issues in the document include protection of surface soils and surface waters, future and use, and permanent documentation of plugged and abandoned wellbore locations and conditions. Pages: 52

1st Edition | January 1993 | Reaffirmed: June 1, 2000
Product Number: G11007 | Price: $137.00

Bull E4
Environmental Guidance Document: Release Reporting for the Oil and Gas Exploration and Production Industry as Required by the Clean Water Act, the Comprehensive Environmental Response, Compensation and Liability Act, and the Emergency Planning and Community Right-to-Know Act

Developed to provide the oil and gas production industry guidance on reporting releases of hazardous substances and petroleum to water as required by the Clean Water Act (CWA) and reporting releases of hazardous substances into the environment as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Emergency Planning and Community Right-to-Know Act (EPCRA). Also covers the reporting of what most in the industry consider "emergency" releases, which are unplanned and typically are not covered under a permit issued by a government agency. Pages: 106

2nd Edition | May 2003 | Product Number: GE4002 | Price: $164.00

HEALTH, ENVIRONMENT AND SAFETY: NATURALLY OCCURRING RADIOACTIVE MATERIALS

Publ 7100
A NORM Disposal Cost Study

Details the reported quantities of NORM that have accumulated over the years and the annual rate of NORM production for 1993 from U.S. oil and gas condensate production. The document also determines the 1992 cost of available NORM disposal options and the annual costs of complying with existing and proposed NORM regulations. Pages: 59

1st Edition | November 1996 | Product Number: G71001 | Price: $111.00

Publ 7101
A National Survey on Naturally Occurring Radioactive Material (NORM) in Petroleum Producing and Gas Processing Facilities

Defines the general occurrence of NORM in the United States based on statistical analysis of gamma measurements taken external to certain petroleum producing and gas processing equipment. Pages: 265

October 2007 | Product Number: G71011 | Price: $111.00

Publ 7102
Methods for Measuring Naturally Occurring Radioactive Materials (NORM) in Petroleum Production Equipment

The use and capabilities of common field-survey equipment are characterized for measuring NORM in sludges and scales accumulated in oil and gas production equipment. A correlation between radium concentrations in accumulated scales and sludges and measured external radiation is presented. Pages: 85

October 1997 | Product Number: G71021 | Price: $111.00

Publ 7103
Management and Disposal Alternatives for Naturally Occurring Radioactive Material (NORM) Wastes in Oil Production and Gas Plant Equipment

Presents radiological analyses of disposal alternatives that will protect against elevated radiation exposures and facilitate cost-effective precautions that are proportionate to any hazards posed by the NORM. Four waste forms and 12 waste disposal alternatives were analyzed. Pages: 65

October 1997 | Product Number: G71031 | Price: $111.00

Publ 7104
Proceedings of the 1995 API and GRI Naturally Occurring Radioactive Material (NORM) Conference

A compilation of 17 papers presented at the 1995 API/GRI NORM Conference. Subjects include Measurement and Survey; Regulatory Issues and Activities; Management and Disposal; and Scale Prediction and Control. Pages: 225

October 1997 | Product Number: G71041 | Price: $111.00

Publ 7105
Probabilistic Estimates of Dose and Indoor Radon Concentrations Attributable to Remediated Oilfield Naturally Occurring Radioactive Material (NORM)

Evaluates the concentration limit of 30 pCi/g Ra-226 in pipe scale and sludge left near the surface of remediated oilfield sites and returned to unrestricted public use. Includes an extensive bibliography of NORM research. Pages: 97

October 1997 | Product Number: G71051 | Price: $111.00

Bull E2
Management of Naturally Occurring Radioactive Materials (NORM) in Oil and Gas Production

Naturally occurring radioactive materials (NORM) are present in oil and gas operations at some locations and can deposit in well tubulars, surface piping, vessels, pumps, and other producing and processing equipment. The purpose of this document is to inform oil and gas operators of the possible presence of NORM and to provide relevant information on protecting workers, the public, and the environment. The objective of this document is to provide general information to users so that they have an understanding of the fundamental radiation issues associated with the management of NORM. Issues where the advice of a professional health physicist, industrial hygienist, or other technical expert may be useful are identified and guidance provided. Readers are advised to contact their state regulatory office and work very closely with that office on all NORM issues. Pages: 50

2nd Edition | March 2006 | Product Number: GE2002 | Price: $118.00

HEALTH, ENVIRONMENT AND SAFETY: WASTE

Guidelines for Commercial Exploration and Production Waste Management

Provides guidelines for the design and operations of commercial E&P waste management facilities to allow operators to identify areas where their facility could have impacts on the surrounding community and environment, and gives options for preventing/reducing those impacts. The guidelines are not meant to supersede any applicable local, state or federal requirements.

March 2001 | Product Number: G00004
For a Free copy of this document, please visit
http://www.api.org/aboutoilgas/sectors/explore/guidelines.cfm

Protecting Livestock Answers to Frequently Asked Questions about Livestock Exposure to Crude Oil in Oilfield Operations

Describes ways livestock might be significantly exposed to petroleum hydrocarbons via a conceptual site model, and outlines how to make a screening level determination of whether or not livestock are at risk from the exposure.

Product Number: I0PL06 | For a free copy, please visit
http://www.api.org/aboutoilgas/sectors/explore/livestock.cfm

Publ 4527
Evaluation of Limiting Constituents Suggested for Land Disposal of Exploration and Production Wastes

Describes a study to develop salinity and petroleum hydrocarbon threshold guidance values that typically should not be exceeded for one-time land application of exploration and production wastes. Definition, technical justification, and guidance for application of threshold values are provided. Measurable parameters that serve as indices for proper environmental management of salinity and petroleum hydrocarbons include: electrical conductivity (EC), sodium adsorption ratio (SAR) and exchangeable sodium percentage (ESP) for salinity, and oil and grease (OG) for petroleum hydrocarbons. Pages: 66

August 1993 | Product Number: I45270 | Price: $59.00

Publ 4600
Metals Criteria for Land Management of Exploration and Production Wastes: Technical Support Document of API Recommended Guidance Values

Provides scientifically defensible guidelines for land management of E&P wastes containing metals. It provides the technical support for recommended maximum concentrations of 12 metals. The guidance values for arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc were adopted directly from sewage sludge regulations promulgated by EPA in 1993. A risk-based approach was used to develop guidance values for barium and boron. The report also provides practical information on sample collection, analyses, and calculation of waste application rates. Pages: 56

January 1995 | Product Number: I46000 | Price: $57.00

Publ 4663
Remediation of Salt-Affected Soils at Oil and Gas Production Facilities

Water separated from oil and gas during production contains dissolved solids, including salt. If improperly handled, produced water with sufficient salt concentrations can damage plants and soils. Therefore, this manual was designed to assist the oil and gas environmental professional and field personnel to (1) assess sites with salt-affected soils, (2) evaluate remedial alternatives, and (3) conduct remedial activities, if necessary. It provides forms for organizing assessment information and conducting sample collection and analysis. Remediation options are divided into three primary groupings: natural remediation, in situ chemical amendment remediation, and mechanical remediation. A decision tree and worksheets are provided to aid in the selection of a remedial option(s). Technical approaches for applying each group of remedial options are discussed. A number of appendices provide supplementary information on various aspects of salt-affected soil remediation.

October 1997 | Product Number: I46630 | Price: $106.00

Publ 4709
Risk-Based Methodologies for Evaluating Petroleum Hydrocarbon Impacts at Oil and Natural Gas E&P Sites

The process of calculating human health risk-based screening levels for total petroleum hydrocarbons (TPH) is described in an easy-to-understand question and answer format. (Risk-based screening levels [RBSLs] are chemical-specific concentrations in environmental media that are considered protective of human health.) Risk assessment concepts developed by the EPA, and research groups such as the Petroleum Environmental Research Forum (PERF) and the Total Petroleum Hydrocarbon Criteria Working Group (TPH-CWG), are used to calculate RBSLs for TPH in crude oil and condensates obtained from around the world. These methodologies were also applied to polyaromatic hydrocarbons (PAHs), metals, and benzene in TPH. Additional resources contained in this manual include a description of the physical and chemical characteristics of crude oil, condensate, and E&P wastes (contrasted with refined products), a summary of the federal regulatory status of E&P wastes, and a listing of key equations used for calculating RBSLs.

February 2001 | Product Number: I47090 | Price: $80.00

Publ 4733
Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbons

The purpose of this study was to develop toxicity values and screening guidelines for evaluating risks to livestock from exposure to petroleum hydrocarbons. This report addresses how to determine whether livestock should be included in a risk evaluation, and estimate risks of petroleum hydrocarbon exposures to livestock. Pages: 40

July 2004 | Product Number: I48330 | Price: $89.00

Publ 4734
Modeling Study of Produced Water Release Scenarios

Provides a scientific basis for operators, regulators and landowners to determine if assessment or remediation of produced water releases will provide a meaningful environmental benefit. Pages: 124

January 2005 | Product Number: I47340 | Price: $119.00

Publ 4758
Strategies for Addressing Salt Impacts of Produced Water Releases to Plants, Soil, and Groundwater

The exploration and production (E&P) industry uses great care during the handling and disposal of the produced water that is generated as part of oil and gas production. However, unintentional releases can occur. Depending on the chemical composition of the produced water and the nature of the local environment, salts associated with such releases can impair soils vegetation, and water resources. This guide provides a collection of simple rules of thumb, decision charts, models, and summary information from more detailed guidance manuals to help you address the following assessments and response issues:

- Will a produced water release cause an unacceptable impact on soils, plants, and/or groundwater
- In the event of such an impact, what response actions are appropriate and effective Pages: 28

September 2006 | Product Number: I47580 | Price: $67.00

API E5
Environmental Guidance Document: Waste Management in Exploration and Production Operations

Includes recommendations for the environmentally sound management of solid waste resulting from the exploration and production of oil and gas. Guidance is provided for the management of drilling fluids, produced waters, and other wastes associated with the operation of gas plants, field facilities, drilling, and workover. Pages: 84

2nd Edition | February 1997 | Product Number: GE5002 | Price: $121.00

HEALTH, ENVIRONMENT AND SAFETY: WATER

DR 351
Proceedings: Workshop to Identify Promising Technologies for the Treatment of Produced Water Toxicity

These proceedings present the discussions, conclusions and recommendations of an API workshop held in October 1994 to identify technologies which could potentially be used for the treatment of produced water toxicity offshore. Background information on the candidate technologies; information on produced water toxicity limitations, characteristics and composition; results of Toxicity Identification Evaluations; and a discussion of the engineering restrictions imposed by offshore platforms are included. Pages: 122

June 1996 | Product Number: I00351 | Price: $70.00

SECURITY

RP 70
Security for Offshore oil and Natural Gas Operations

Intended to assist the offshore oil and natural gas drilling and producing operators and contractors in assessing security needs during the performance of oil and natural gas operations. It includes information on security awareness, conducting security vulnerability assessments when warranted, and developing security plans for offshore facilities. Pages: 16

1st Edition | March 2003 | Product Number: G07001 | Price: $55.00

RP 70I
Security for Worldwide Offshore Oil and Natural Gas Operations

Intended to assist the offshore oil and natural gas drilling and producing operators and contractors in assessing security needs during the performance of oil and natural gas operations worldwide. Pages: 14

1st Edition | April 2004 | Product Number: G70I03 | Price: $59.00

API Standard for Third Party Network Connectivity

Provides guidance for implementing secure third-party connections between the information technology systems and network of two companies that have a business relations and a common objective.

The standard will provide suggestions for companies to establish third-party network connections while protecting their individual systems and data from unauthorized access or manipulation. Pages: 36

1st Edition | October 2007 | Product Number: TSTP01 | Price: $87.00

Security Guidance for the Petroleum Industry

API's Second Edition of *Security Guidance for the Petroleum Industry*, is now in use at oil and gas facilities around the world to help managers decide how to deter terrorist attacks. Covering all segments of the industry (production, refining, transportation, pipeline, and marketing), this guidance builds on the existing solid foundation of design and operational regulations, standards, and recommended practices, which relate to facility design and safety, environmental protection, emergency response, and protection from theft and vandalism. Produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies, these guidelines, viewed as a living document, are broadly applicable to facility security in light of September 11, 2001, and provide the starting point for developing security plans at oil and natural gas facilities and operations. Pages: 169

2nd Edition | March 2003 | Product Number: OS0001 | Price: $185.00

Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

The American Petroleum Institute and the National Petrochemical & Refiners Association jointly developed a new methodology for evaluating the likelihood and consequences of terrorist attacks against refineries and petrochemical facilities. *Security Vulnerability Assessment Methodology for Petroleum and Petrochemical Facilities* is designed for companies to use in assessing vulnerabilities and potential damages from different kinds of terrorist attacks. In the post September 11 era, companies have reevaluated and enhanced security at their facilities. The methodology will provide officials with a new analytical tool to determine "the likelihood of an adversary successfully exploiting vulnerability and the resulting degree of damage or impact." This vulnerability assessment methodology was produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies. Pages: 155

October 2004 | Product Number: OSVA02 | Price: $185.00

SECURITY—TRAINING COURSES

Workshop on Industry Security Vulnerability Assessments (SVAs)
www.api-u.org/SVA.html

API presents the leading SVA training for the petroleum, petrochemical and chemical industries. The objective of an SVA is to identify security hazards, threats and vulnerabilities facing a facility and to evaluate the countermeasures to provide for the protection of the public, workers, national interests, the environment, and the company.

Workshop on USCG Regulations for Facility Security Officers (FSOs)
www.api-u.org/FSO.html

Learn about the requirements for Facility Security Officers released in the U.S. Coast Guard (USCG) Final Rule: Part 105, Subpart B. Course materials include a reference CD of over 30 helpful related documents including the regulation, NVICs, API's "Security Vulnerability Assessment for the Petroleum & Petrochemical Industries", and numerous DHS bulletins.

If you have any questions or comments regarding API standards, please visit www.api.org/standards.

MANUAL OF PETROLEUM MEASUREMENT STANDARDS

The Institute currently maintains a comprehensive API *Manual of Petroleum Measurement Standards*. This manual is an ongoing project, as new chapters and revisions of old chapters will be released periodically. Publications regarding measurement of evaporative loss are listed under Chapter 19 of the API *Manual of Petroleum Measurement Standards*.

Manual of Petroleum Measurement Standards (Complete Set)

The price of the complete set is subject to change as new chapters and sub-chapters are released; an order for one complete set would not include the chapters released after the release date of this catalog (but before order receipt), and the binders to house the set.

NOTE: Chapter 11 and Chapter 19 standards, and Spanish translations, must be ordered separately.

Price: $8,800.00 | *Price subject to change (If purchased individually, a complete set would cost approximately $10,000.00)

Chapter 1
Vocabulary

Provides definitions and terms used throughout the API *Manual of Petroleum Measurement Standards* (*MPMS*). Pages: 70

2nd Edition | July 1994 | Product Number: H01002 | Price: $105.00

Chapter 1-SP
Vocabulary—Spanish

The Spanish translation of Chapter 1. Pages: 82

2nd Edition | July 1994 | Product Number: H010SP | Price: $111.00

Chapter 2
Tank Calibration

Procedures necessary for calibrating closed storage vessels larger than a drum, and methods for computing the volumes contained therein. The following API standards cover the subject of tank calibration and are included in the manual.

Chapter 2.2A
Measurement and Calibration of Upright Cylindrical Tanks by the Manual Strapping Method

Procedures for calibrating upright cylindrical tanks used primarily for the storage of petroleum liquids. Chapter 2.2A addresses necessary measurement procedures to determine total and incremental tank volumes and procedures for computing volumes. Both metric and customary units are included. The metric units reflect what is available in commercial equipment. The standard also provides guidelines for recalibration and computerization of capacity tables. Chapter 2.2A should be used in conjunction with Chapter 2.2B. These two standards combined supersede the previous API Standard 2550, *Measurement and Calibration of Upright Cylindrical Tanks*. Pages: 58

1st Edition | February 1995 | Reaffirmed: February 1, 2007
Product Number: H022A1 | Price: $121.00

Chapter 2.2B
Calibration of Upright Cylindrical Tanks Using the Optical Reference Line Method

Describes measurement and calculation procedures for determining the diameters of upright, welded (lap/butt) cylindrical tanks, or vertical cylindrical tanks, with a smooth outside surface and either floating or fixed roofs. The optical reference line method is an alternative to the manual tank strapping method for determining tank diameter. Chapter 2.2B should be used in conjunction with API Standard 2.2A. Pages: 8

1st Edition | March 1989 | Reaffirmed: December 1, 2007
Product Number: H30023 | Price: $80.00

Chapter 2.2C/ISO 7507-3:1993
Calibration of Upright Cylindrical Tanks Using the Optical-Triangulation Method
(ANSI/API MPMS 2.2C-2002)

Describes the calibration of vertical cylindrical tanks by means of optical triangulation using theodolites. The method is an alternative to other methods such as strapping (*MPMS* Chapter 2.2A) and the optical-reference-line method (*MPMS* Chapter 2.2B).

This edition of Chapter 2.2C is the national adoption of ISO 7507-3:1993. Pages: 19

1st Edition | January 2002 | Reaffirmed: May 1, 2008
Product Number: H022C1 | Price: $80.00

Chapter 2.2D/ISO 7507-4:1995
Calibration of Upright Cylindrical Tanks Using the Internal Electro-optical Distance Ranging Method
Petroleum and liquid petroleum products—Calibration of vertical cylindrical tanks—Part 4: Internal electro-optical distance ranging method
(ANSI/API MPMS 2.2D-2003)

Specifies a method for the calibration of upright cylindrical tanks having diameters greater than 5 m by means of internal measurements using an electro-optical distance-ranging instrument, and for the subsequent compilation of tank capacity tables.

This edition of Chapter 2.2D is the national adoption of ISO 7507-4:1995. Pages: 13

1st Edition | August 2003 | Reaffirmed: February 11, 2009
Product Number: H022D1 | Price: $80.00

Chapter 2.2E/ISO 12917-1:2002
Petroleum and Liquid Petroleum Products—Calibration of Horizontal Cylindrical Tanks—Part 1: Manual Methods
(includes Errata dated November 2009)
(ANSI/API MPMS 2.2E-2004)

Specifies manual methods for the calibration of nominally horizontal cylindrical tanks, installed at a fixed location. It is applicable to horizontal tanks up to 4 m (13 ft) in diameter and 30 m (100 ft) in length. The methods are applicable to insulated and non-insulated tanks, either when they are above-ground or underground. The methods are applicable to pressurized tanks, and to both knuckle-dish-end and flat-end cylindrical tanks as well as elliptical and spherical head tanks. This Chapter is applicable to tanks inclined by up to 10 % from the horizontal provided a correction is applied for the measured tilt. For tanks over and above these dimensions and angle of tilt, appropriate corrections for tilt and appropriate volume computations should be based on the "Coats" equation.

This edition of Chapter 2.2E is the national adoption of ISO 12917-1:2002. Pages: 18

1st Edition | April 2004 | Reaffirmed: October 16, 2009
Product Number: HX202E01 | Price: $85.00

Chapter 2.2F/ISO 12917-2:2002
Petroleum and Liquid Petroleum Products—Calibration of Horizontal Cylindrical Tanks—Part 2: Internal Electro-optical Distance-ranging Method
(ANSI/API MPMS 2.2F-2004)

Specifies a method for the calibration of horizontal cylindrical tanks having diameters greater than 2 m (6 ft) by means of internal measurements using an electro-optical distance-ranging instrument, and for the subsequent compilation of tank-capacity tables. This method is known as the internal electro-optical distance-ranging (EODR) method.

This edition of Chapter 2.2F is the national adoption of ISO 12917-2:2002. Pages: 14

1st Edition | April 2004 | Reaffirmed: October 16, 2009
Product Number: HH202F01 | Price: $74.00

Std 2552
Measurement and Calibration of Spheres and Spheroids

Describes the procedures for calibrating spheres and spheroids, which are used as liquid containers. It outlines the procedures for the measurement and calibration of spherical tanks. Pages: 17

1st Edition | October 1966 | Reaffirmed: October 24, 2007
Product Number: H25520 | Price: $94.00

Std 2554
Measurement and Calibration of Tank Cars

Describes the procedures for calibrating tank cars. It outlines procedures for nonpressure-type tank cars and pressure-type tank cars. Pages: 41

1st Edition | October 1966 | Reaffirmed: July 1, 2007
Product Number: H25540 | Price: $111.00

Std 2555
Liquid Calibration of Tanks

Describes the procedure for calibrating tanks, or portions of tanks, larger than a barrel or drum by introducing or withdrawing measured quantities of liquid. Pages: 14

1st Edition | September 1966 | Reaffirmed: March 11, 2009
Product Number: H25550 | Price: $94.00

RP 2556
Correcting Gauge Tables for Incrustation

Incrustation is defined in this publication as any material that adheres to the internal vertical sidewall surfaces of a tank when the tank is otherwise empty. The tables given in this recommended practice show the percent of error of measurement caused by varying thicknesses of uniform incrustation in tanks of various sizes. Pages: 3

2nd Edition | August 1993 | Reaffirmed: September 26, 2008
Product Number: H25560 | Price: $73.00

Chapter 2.7
Calibration of Barge Tanks

Describes three methods for determining the total incremental volumes of liquids in barge tanks for coastal and inland waterway service that have integral hull tanks. The three methods are as follows: (a) Liquids calibration. (b) Calibration by linear measurement. (c) Calibration from vessel drawings. This document and Chapter 2.8A supersede the previous API Standard 2553. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM2 Section 5A. Pages: 25

1st Edition | March 1991 | Reaffirmed: May 1, 2008
Product Number: H30044 | Price: $57.00

Chapter 2.8A
Calibration of Tanks on Ships and Oceangoing Barges

Three methods for determining the total and incremental volumes of liquids in tanks, oceangoing barges, and integrated tug barge units that have integral hull tanks. The three methods include liquid calibration, calibration by linear measurement, and calibration from vessel drawings. This document and Chapter 2.7 supersede the previous API Standard 2553. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM2 Section 5B. Pages: 22

1st Edition | March 1991 | Reaffirmed: February 1, 2007
Product Number: H30049 | Price: $86.00

Chapter 2.8B
Establishment of the Location of the Reference Gauge Point and the Gauge Height of Tanks on Marine Tank Vessels

Recommended practice, for use in conjunction with API Chapter 2.7 *Calibration of Tanks on Barges*, and API Chapter 2.8A *Calibration of Tanks on Ships and Oceangoing Barges*. Establishes reference gauge heights during calibration of marine tank vessels. A reference gauge point is necessary for converting ullage to innage, and when determining the volume of the quantities remaining on board (ROB). A reference gauge point is also used for wedge formulas and establishing wedge tables. Pages: 26

1st Edition | September 1995 | Reaffirmed: October 14, 2009
Product Number: H028B1 | Price: $94.00

Chapter 3
Tank Gauging

Standardized procedures for gauging liquid hydrocarbons in various types of tanks, containers, and carriers.

Chapter 3.1A
Standard Practice for the Manual Gauging of Petroleum and Petroleum Products

Describes the following: (a) the procedures for manually gauging the liquid level of petroleum and petroleum products in non-pressure fixed-roof, floating-roof tanks and marine tank vessels, (b) procedures for manually gauging the level of free water which may be found with the petroleum or petroleum products, (c) methods used to verify the length of gauge tapes under field conditions and the influence of bob weights and temperature on the gauge tape length, and (d) the influences that may affect the position of gauging reference point (either the datum plate or the reference gauge point). Throughout this standard the term petroleum is used to denote petroleum, petroleum products, or the liquids normally associated with the petroleum industry. The method used to determine the volume of tank contents determined from gauge readings is not covered in this standard. The determination of temperature, API gravity, and suspended sediment and water of the tank contents are not within the scope of this standard. Pages: 25

2nd Edition | August 2005 | Product Number: H301A02 | Price: $91.00

Chapter 3.1A-SP
Standard Practice for the Manual Gauging of Petroleum and Petroleum Products—Spanish

The Spanish translation of Chapter 3.1A.

2nd Edition | August 2005 | Product Number: H3010ASP | Price: $96.00

Chapter 3.1B
Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Tanks by Automatic Tank Gauging

Covers level measurement of liquid hydrocarbons in stationary, aboveground, atmospheric storage tanks using automatic tank gauges (ATGs). This publication discusses automatic tank gauging in general, calibration of ATGs for custody transfer and inventory control, and the requirements for data

collection, transmission, and receiving. The appendices discuss the operation and installation of the most commonly used ATG equipment and of the less commonly used, electronic ATGs. Pages: 17

2nd Edition | June 2001 | Reaffirmed: October 1, 2006
Product Number: H301B2 | Price: $94.00

Chapter 3.2
Standard Practice for Gauging Petroleum and Petroleum Products in Tank Cars

Provides method for measuring liquids and liquefied gases in tank cars by liquid level measurement. Measurement of both vapor space and liquid level are covered. Gauging and temperature measurement equipment used in both open and closed measurement systems are described in this standard. These procedures reduce variability in the results of measurement and sampling operations when comparing loading terminal data to unloading terminal data. Pages: 20

1st Edition | September 1995 | Reaffirmed: March 1, 2006
Product Number: H03021 | Price: $94.00

Chapter 3.3
Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Pressurized Storage Tanks by Automatic Tank Gauging

Provides guidance on the installation, calibration, and verification of automatic tank gauges (ATGs) used in custody transfer for measuring the level of liquid hydrocarbons having a Reid vapor pressure of 15 psi (103 kilopascals) or greater, stored in stationary, pressurized storage tanks. This standard also provides guidance on the requirements for data collection, transmission, and receiving. Pages: 10

1st Edition | June 1996 | Reaffirmed: October 1, 2006
Product Number: H03031 | Price: $80.00

Chapter 3.4
Standard Practice for Level Measurement of Liquid Hydrocarbons on Marine Vessels by Automatic Tank Gauging

Provides guidance on the selection, installation, calibration, and verification of automatic tank gauges (ATGs) for measuring the level of liquid hydrocarbons having a Reid vapor pressure less than 15 pounds per square inch absolute (103 kPa), transported aboard marine vessels (tankers and barges). This standard also provides guidance on the requirements for data collection, transmission, and receiving. This standard supersedes all applicable sections of API Standard 2545. Pages: 10

1st Edition | April 1995 | Reaffirmed: March 1, 2006
Product Number: H03041 | Price: $80.00

Chapter 3.5
Standard Practice for Level Measurement of Light Hydrocarbon Liquids Onboard Marine Vessels by Automatic Tank Gauging

Covers the standard practice for level measurement of light hydrocarbon liquids onboard marine vessels by automatic tank gauges (ATGs). This publication covers pressurized and refrigerated light hydrocarbon liquids. The light hydrocarbon liquids covered include: liquefied petroleum gas (LPG), natural gas liquid (NGL), and other petrochemical liquids where the storage and transportation requirements and the methods of measurement are similar to that for LPG and NGL gauging. This standard also covers the requirements for data collection, transmission, and receiving. Pages: 8

1st Edition | March 1997 | Reaffirmed: February 28, 2008
Product Number: H03051 | Price: $80.00

Chapter 3.6
Measurement of Liquid Hydrocarbons by Hybrid Tank Measurement Systems
(includes Errata dated September 2005)

Covers selection, installation, commissioning, calibration and verification of Hybrid Tank Measurement Systems (HTMSs) for the measurement of level, static mass, observed and standard volume, and observed and reference density in tanks storing petroleum and petroleum products for custody transfer and/or inventory control purposes. Pages: 26

1st Edition | February 2001 | Reaffirmed: October 1, 2006
Product Number: H03061 | Price: $93.00

Chapter 4
Proving Systems

This chapter serves as a guide for the design, installation, calibration, and operation of meter proving systems.

Chapter 4.1
Introduction

General introduction to the subject of proving. The requirements in Chapter 4 are based on customary practices that evolved for crude oils and products covered by API *MPMS* Chapter 11.1. The prover and meter uncertainties should be appropriate for the measured fluids and should be agreeable to the parties involved. Pages: 4

3rd Edition | February 2005 | Reaffirmed: September 10, 2009
Product Number: H04013 | Price: $79.00

Chapter 4.2
Displacement Provers

Outlines the essential elements of provers that accumulate meter pulses as a displacing element within the prover travels between detector switches. It provides design and installation details for the types of displacement provers that are currently in use. The provers discussed are designed for proving measurement devices under dynamic operating conditions with single-phase liquid hydrocarbons. Pages: 45

3rd Edition | September 2003 | Product Number: H04023 | Price: $119.00

Chapter 4.4
Tank Provers

Specifies the characteristics of tank provers that are in general use and the procedures for their calibration. This standard does not apply to weir-type, vapor-condensing, dual-tank water-displacement, or gas-displacement provers. Pages: 11

2nd Edition | May 1998 | Reaffirmed: November 1, 2005
Product Number: H30084 | Price: $80.00

Chapter 4.5
Master-Meter Provers

Covers the use of both displacement and turbine meters as master meters. Pages: 3

2nd Edition | May 2000 | Reaffirmed: August 1, 2005
Product Number: H04052 | Price: $63.00

Chapter 4.6
Pulse Interpolation
(includes Errata dated April 2007)

Describes how the double-chronometry method of pulse interpolation, including system operating requirements and equipment testing, is applied to meter proving. Pages: 8

2nd Edition | May 1999 | Reaffirmed: May 1, 2008
Product Number: H04062 | Price: $63.00

Chapter 4.7 ■
Field Standard Test Measures

Details the essential elements of field standard test measures by providing descriptions, construction requirements, as well as inspection, handling, and calibration methods. Bottom-neck scale test measures and prover tanks are not addressed in this document. The scope of this standard is limited to the certification of "delivered volumes" of test measures. Pages: 19

3rd Edition | April 2009 | Product Number: H40703 | Price: $83.00

Chapter 4.8
Operation of Proving Systems

Covers the operation of various meter-proving systems used in the petroleum industry. Liquid petroleum meters used for custody transfer measurement require periodic proving to verify accuracy and repeatability and to establish valid meter factors. Pages: 70

1st Edition | November 1995 | Reaffirmed: March 1, 2007
Product Number: H04081 | Price: $105.00

Chapter 4.9.1
Methods of Calibration for Displacement and Volumetric Tank Provers Part 1—Introduction to the Determination of the Volume of Displacement and Tank Provers

Provers are precision devices, defined as volumetric standards, which are used to verify the accuracy of liquid volumetric meters used for custody transfer measurement. Both displacement and tank provers are used to prove a meter in order to obtain its meter factor, which is then used to correct for meter error caused by differences between the metered volume and the true volume. The base volume of a displacement or tank prover, determined by calibration, is an essential requirement in the determination of these meter factors. The accuracy of a meter factor is limited by several considerations, as shown below.

- Equipment Performance.
- Observation Errors.
- Prover Volume Calibration Errors.
- Calculation Errors. Pages: 28

1st Edition | October 2005 | Product Number: H409011 | Price: $73.00

Chapter 4.9.2
Methods of Calibration for Displacement and Volumetric Tank Provers Part 2—Determination of the Volume of Displacement and Tank Provers by the Waterdraw Method of Calibration

All prover volumes used to calibrate meters shall be determined by calibration and not by theoretical calculation. Volumetric provers have an exact reference volume, which has been determined by a recognized method of calibration. Techniques for the determination of this reference volume include the waterdraw, master meter and gravimetric methods of calibration. This standard describes only the waterdraw method of calibration, which is used to accurately determine the calibrated volume of both displacement and tank provers. Pages: 92

1st Edition | December 2005 | Product Number: H409021 | Price: $176.00

Chapter 5
Metering

Covers the dynamic measurement of liquid hydrocarbons, by means of meters and accessory equipment.

Chapter 5.1
General Considerations for Measurement by Meters

Intended to be a guide for the proper specification, installation, and operation of meter runs designed to dynamically measure liquid hydrocarbons so that acceptable accuracy, service life, safety, reliability, and quality control can be achieved. API *MPMS* Chapter 5 also includes information that will assist in troubleshooting and improving the performance of meters. Pages: 8

4th Edition | October 2005 | Product Number: H05014 | Price: $91.00

Chapter 5.2
Measurement of Liquid Hydrocarbons by Displacement Meters

API *MPMS* Chapter 5.2, together with the general considerations for measurement by meters found in API *MPMS* Chapter 5.1, describes methods for obtaining accurate quantity measurement with displacement meters in liquid hydrocarbon service. It covers the unique performance characteristics of displacement meters in liquid hydrocarbon service. It does not apply to the measurement of two-phase fluids. Pages: 3

3rd Edition | October 2005 | Product Number: H05023 | Price: $84.00

Chapter 5.3
Measurement of Liquid Hydrocarbons by Turbine Meters (includes Addendum 1 dated July 2009)

Defines the application criteria for turbine meters and discusses appropriate considerations regarding the liquids to be measured. Discusses the installation of a turbine metering system; and the performance, operation, and maintenance of turbine meters in liquid hydrocarbon service. Includes "Selecting a Meter and Accessory Equipment" and information on the recommended location for prover connections. Pages: 11

5th Edition | September 2005 | Product Number: H05035 | Price: $102.00

Chapter 5.4
Accessory Equipment for Liquid Meters

Describes the characteristics of accessory equipment used with displacement and turbine meters in liquid hydrocarbon service. Includes guidance on the use of electronic flow computers. Pages: 8

4th Edition | September 2005 | Product Number: H05044 | Price: $91.00

Chapter 5.5
Fidelity and Security of Flow Measurement Pulsed-Data Transmission Systems

Serves as a guide for the selection, operation, and maintenance of various types of pulsed-data, cabled transmission systems for fluid metering systems to provide the desired level of fidelity and security of transmitted flow pulse data. This publication does not endorse or advocate the preferential use of any specific type of equipment or systems, nor is it intended to restrict future development of such equipment. Pages: 8

2nd Edition | July 2005 | Product Number: H50502 | Price: $67.00

Chapter 5.6
Measurement of Liquid Hydrocarbons by Coriolis Meters (ANSI/API MPMS 5.6-2002)

Describes methods for achieving custody transfer levels of accuracy when a Coriolis meter is used to measure liquid hydrocarbons. Topics covered include: applicable API standards used in the operation of Coriolis meters; proving and verification using both mass- and volume-based methods; installation, operation, and maintenance. Both mass- and volume-based calculation procedures for proving and quantity determination are included in Appendix E. Pages: 48

1st Edition | October 2002 | Reaffirmed: March 20, 2008
Product Number: H05061 | Price: $134.00

Chapter 5.8
Measurement of Liquid Hydrocarbons by Ultrasonic Flowmeters Using Transit Time Technology

Describes methods for obtaining custody transfer level measurements with ultrasonic flow meters (UFMs) used to measure liquid hydrocarbons. This document includes application criteria for UFM and includes considerations

regarding the liquids being measured. This document also address the installation, operation, proving and maintenance of UFMs in liquid hydrocarbon service.

1st Edition | February 2005 | Product Number: H050801 | Price: $75.00

Draft Standard
Vortex Shedding Flowmeter for Measurement of Hydrocarbon Fluids

Describes the design, installation and operation of vortex shedding flowmeters for the measurement of fluid flows, especially hydrocarbon flow measurement. It is being issued initially as a draft standard in order for the industry to obtain more experience with the technology, as well as to determine where this technology may best be applied within the industry. One particular are where additional experience is needed prior to converting this to a custody transfer standard is in the area of proving. However, this document may provide guidance for non-custody application where the technology provides benefits. Pages: 32

1st Edition | January 2007 | Product Number: HDVSF00 | Price: $93.00

Chapter 6
Metering Assemblies

Discussion of the design, installation and operation of metering systems for coping with special situations in hydrocarbon measurement.

Chapter 6.1
Lease Automatic Custody Transfer (LACT) Systems

Prepared as a guide for the design, installation, calibration, and operation of a lease automatic custody transfer (LACT) system. It applies to unattended and automatic measurement by meter of hydrocarbon liquids produced in the field and transferred to a pipeline in either a scheduled or nonscheduled operation. Pages: 6

2nd Edition | May 1991 | Reaffirmed: April 1, 2007
Product Number: H30121 | Price: $58.00

Chapter 6.2
Loading Rack Metering Systems

Serves as a guide in the selection, installation and operation of loading rack metering systems for petroleum products, including liquefied petroleum gas. This standard does not endorse or advocate the preferential use of any specific type of metering system or meter.

3rd Edition | February 2004 | Product Number: H60203 | Price: $76.00

Chapter 6.4
Metering Systems for Aviation Fueling Facilities

General requirements of flow metering of aviation fuel as it is either dispensed to an aircraft or used to defuel an aircraft. Pages: 9

2nd Edition | January 2007 | Product Number: H60402 | Price: $63.00

Chapter 6.5
Metering Systems for Loading and Unloading Marine Bulk Carriers

Deals with the operation and special arrangements of meters, provers, manifolding, instrumentation, and accessory equipment used for measurement during loading and unloading of marine bulk carriers. Pages: 6

2nd Edition | May 1991 | Reaffirmed: April 2, 2007
Product Number: H30125 | Price: $63.00

Chapter 6.6
Pipeline Metering Systems

Provides guidelines for selection of the type and size of meters to be used to measure pipeline oil movements, as well as the relative advantages and disadvantages of the methods of proving meters by tank prover, conventional pipe prover, small volume prover, and master meter. It also includes discussion on obtaining the best operating results from a pipeline-meter station. Pages: 9

2nd Edition | May 1991 | Reaffirmed: February 1, 2007
Product Number: H30126 | Price: $63.00

Chapter 6.7
Metering Viscous Hydrocarbons

Serves as a guide for the design, installation, operation and proving of meters and auxiliary equipment used in metering viscous hydrocarbons. It defines viscous hydrocarbons and describes the difficulties that arise when viscous hydrocarbons are raised to high temperature. The effects of such temperatures on meters, auxiliary equipment, and fittings are discussed, and advice and warnings to overcome or mitigate difficulties are included. Pages: 6

2nd Edition | May 1991 | Reaffirmed: April 1, 2007
Product Number: H30127 | Price: $63.00

Chapter 7
Temperature Determination

Describes methods and practices that may be used to obtain accurate measurements of temperature of petroleum and petroleum products in pipelines, storage tanks, gathering tanks, ships, barges, tank cars, pipe provers, tank provers and test measures under both static and dynamic conditions using electronic temperature measuring devices or mercury-in-glass thermometers. Describes the methods, equipment, and procedures for determining the temperature of petroleum and petroleum products under both static and dynamic conditions. This chapter discusses temperature measurement requirements in general for custody transfer, inventory control, and marine measurements. The actual method and equipment selected for temperature determination are left to the agreement of the parties involved. Pages: 38

1st Edition | June 2001 | Reaffirmed: March 1, 2007
Product Number: H07001 | Price: $191.00

Chapter 8
Sampling

Covers standardized procedures for sampling crude oil or its products.

Chapter 8.1
Manual Sampling of Petroleum and Petroleum Products (ANSI/ASTM D4057)

Covers the procedures for obtaining representative samples of shipments of uniform petroleum products, except electrical insulating oils and fluid power hydraulic fluids. It also covers sampling of crude petroleum and nonuniform petroleum products and shipments. It does not cover butane, propane, and gas liquids with a Reid Vapor Pressure (RVP) above 26 psi. The major addition to the standard is a section on extended-tube sampling. Pages: 24

3rd Edition | October 1995 | Reaffirmed: March 1, 2006
Product Number: H08013 | Price: $94.00

Chapter 8.1
Manual Sampling of Petroleum and Petroleum Products—Spanish

The Spanish translation of Chapter 8.1.

3rd Edition | October 1995 | Reaffirmed: March 1, 2006
Product Number: H8013SP | Price: $99.00

Chapter 8.2
Automatic Sampling of Petroleum and Petroleum Products
(ANSI/ASTM D4177)

Covers automatic procedures for obtaining representative samples of petroleum and nonuniform stocks or shipments, except electrical insulating oil. Pages: 32

2nd Edition | October 1995 | Reaffirmed: June 1, 2005
Product Number: H08022 | Price: $94.00

Chapter 8.3
Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products
(ANSI/ASTM D5854)

Covers the handling, mixing, and conditioning procedures required to ensure that a representative sample of the liquid petroleum or petroleum product is delivered from the primary sample container/receiver into the analytical test apparatus or into intermediate containers. For sampling procedures, refer to Chapters 8.1 and 8.2. Refer to Chapter 8.4 for the mixing and handling of light fuels for volatility measurement. Pages: 27

1st Edition | October 1995 | Reaffirmed: June 1, 2005
Product Number: H08031 | Price: $86.00

Chapter 8.4
Standard Practice for Sampling and Handling of Fuels for Volatility Measurement
(ASTM D5842)

Covers procedures and equipment for obtaining, mixing, and handling representative samples of volatile fuels for the purpose of testing for compliance with the standards set forth for volatility related measurements applicable to light fuels. The applicable dry vapor pressure equivalent range of this practice is 13 to 105 kPa (2 to 16 psia). This practice is applicable to the sampling, mixing, and handling of reformulated fuels including those containing oxygenates. Pages: 7

2nd Edition | December 2004 | Reaffirmed: June 1, 2009
Product Number: H80402 | Price: $37.00

Chapter 9
Density Determination

Describes the standard methods and apparatus used to determine the specific gravity of crude oil and petroleum products normally handled as liquids.

Chapter 9.1
Standard Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
(ANSI/ASTM D1298)

Describes the methods and practices relating to the determination of the density, relative density, or API gravity of crude petroleum and liquid petroleum products using the hydrometer method (laboratory determination). Pages: 6

2nd Edition | December 2002 | Reaffirmed: October 1, 2005
Product Number: H09012 | Price: $37.00

Chapter 9.2
Standard Test Method for Density or Relative Density of Light Hydrocarbons by Pressure Hydrometer
(ANSI/ASTM D1657)

Provides a guide for determining the density or relative density (specific gravity) or API gravity of light hydrocarbons, including liquefied petroleum gases, using a pressure hydrometer. Pages: 4

2nd Edition | March 2003 | Reaffirmed: June 1, 2007
Product Number: H09022 | Price: $37.00

Chapter 9.3
Standard Test Method for Density, Relative Density, and API Gravity of Crude Petroleum and Liquid Petroleum Products by Thermohydrometer Method
(ANSI/ASTM D6822)

Describes methods and practices suitable for the determination of density or API gravity of crude petroleum and liquid petroleum products using thermohydrometers. The test method covers petroleum and liquid petroleum products with Reid vapor pressure of 179 kPa (26 psi) or less. Pages: 7

2nd Edition | November 2002 | Reaffirmed: March 1, 2008
Product Number: H09032 | Price: $37.00

Chapter 10
Sediment and Water

Describes methods for determining the amount of sediment and water, either together or separately in petroleum products. Laboratory and field methods are covered.

Chapter 10.1
Standard Test Method for Sediment in Crude Oils and Fuel Oils by the Extraction Method
(ANSI/ASTM D473)

Covers the determination of sediment in crude oils and fuel oils by extraction with toluene. The precision applies to a range of sediment levels from 0.01 to 0.40 % mass, although higher levels may be determined. Pages: 6

3rd Edition | October 2007 | Product Number: H10013 | Price: $37.00

Chapter 10.2
Determination of Water in Crude Oil by Distillation
(ANSI/ASTM D4006)

Specifies a method for the determination of water in crude petroleum by distillation. Pages: 11

2nd Edition | November 2007 | Product Number: H30202 | Price: $43.00

Chapter 10.3
Standard Test Method for Water and Sediment in Crude Oil by the Centrifuge Method (Laboratory Procedure)
(ANSI/ASTM D4007)

Describes a method of laboratory determination of water and sediment in crude oil by means of the centrifuge procedure. Pages: 13

3rd Edition | May 2008 | Product Number: H10033 | Price: $43.00

Chapter 10.4
Determination of Sediment and Water in Crude Oil by the Centrifuge Method (Field Procedure)

Describes a method for determining both water and sediment or sediment only in crude oils using the field centrifuge procedure. Pages: 10

3rd Edition | December 1999 | Reaffirmed: September 1, 2005
Product Number: H30204 | Price: $73.00

Chapter 10.5
Standard Test Method for Water in Petroleum Products and Bituminous Materials by Distillation
(ANSI/ASTM D95)

Covers the determination of water in the range from 0 to 25 % volume in petroleum products, tars, and other bituminous materials by the distillation method. Pages: 7

4th Edition | August 2005 | Product Number: H100504 | Price: $37.00

Chapter 10.6
Standard Test Method for Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure)
(ANSI/ASTM D1796)

Describes the laboratory determination of water and sediment in fuel oils in the range from 0 to 30 % volume by means of the centrifuge procedure. Pages: 7

4th Edition | December 2004 | Reaffirmed: April 1, 2009
Product Number: H100604 | Price: $37.00

Chapter 10.7
Standard Test Method for Water in Crude Oils by Potentiometric Karl Fischer Titration
(ANSI/ASTM D4377)

Describes the procedure for the determination of water in crude oils by Karl Fischer titration (potentiometric.) This test method covers the determination of water in the range from 0.02 to 2 mass percent in crude oils. Mercaptan and sulfide (S^- or H_2S) sulfur are known to interfere with the method. Pages: 6

2nd Edition | December 2002 | Reaffirmed: October 1, 2006
Product Number: H10072 | Price: $37.00

Chapter 10.8
Standard Test Method for Sediment in Crude Oil by Membrane Filtration
(ANSI/ASTM D4807)

Covers the determination of sediment in crude oils by membrane filtration. This test method has been validated for crude oils with sediments up to approximately 0.15 mass %. The accepted unit of measure for this test method is mass %, but an equation to convert to volume % is provided. Pages: 5

2nd Edition | November 2005 | Product Number: H100802 | Price: $37.00

Chapter 10.9
Standard Test Method for Water in Crude Oils by Coulometric Karl Fischer Titration
(ANSI/ASTM D4928)

Covers the determination of water in the range from 0.02 to 5.0 percent in crude oils. The test method presents two procedures for the direct determination of water content in crude oils; weight and volume. Pages: 5

2nd Edition | December 2002 | Reaffirmed: June 1, 2005
Product Number: H10092 | Price: $37.00

Chapter 11.1
Physical Properties Data (Volume Correction Factors)

Chapter 11 is the physical data that has direct application to volumetric measurement of liquid hydrocarbons. It is presented in tabular form, in equations relating volume to temperature and pressure, and computer subroutines. The subroutines for Chapter 11.1, are available in electronic form. This standards is not included in the complete set of measurement standards. Each element of Chapter 11 must be ordered separately.

Chapter 11.1-2004
Volume Correction Factors
(the 2004 edition of this standard also supersedes Chapters 11.2.1 and 11.2.1M)

The (2004 edition of this) Standard (Revised Standard) was effective on the date of publication and supersedes the previous (1980) edition of the Standard(s). However, due to the nature of the changes in this Revised Standard, it is recognized that guidance concerning an implementation period may be needed in order to avoid disruptions within the industry and ensure proper application. As a result, it is recommended that this Revised Standard be utilized on all new applications no later than TWO YEARS after the publication date. An application for this purpose is defined as the point where the calculation is applied. Once the Revised Standard is implemented in a particular application, the Previous Standard will no longer be used in that application. If an existing application complies with the Previous Standard(s) then it shall be considered in compliance with this Revised Standard. However, the use of API standards remains voluntary and the decision on when to utilize a standard is an issue that is subject to the negotiations between the parties involved in the transaction.

See the listing for "Chapter 11.1-1980" on page 169 of this Catalog for more information on the previous edition of the Standard(s).

Chapter 11.1
Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils
(includes Addendum dated September 2007)

This Standard provides the algorithm and implementation procedure for the correction of temperature and pressure effects on density and volume of liquid hydrocarbons which fall within the categories of crude oil, refined products, or lubricating oils; NGLs and LPGs are excluded from consideration in this Standard. This document is distributed on CD-ROM in Portable Document Format (PDF). A utility program is included on the CD to allow users to calculate corrections for temperature and pressure effects and to print pages of correction factors for a user-defined range of temperature, pressure and density in both US Customary and Metric units of measure. The utility is used within a supported web browser and uses the Java language. Internet access is not required. (Printed tables are not available from either API or ASTM for this edition of Chapter 11.1 Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils.)

September 2004 | Product Number: H11013

Single User | Price: $497.00
2 to 10 Users | Price: $709.00
11 to 50 Users | Price: $919.00
51+ Users | Price: $1,391.00

Chapter 11.1
Add-in Program for Microsoft® Excel

A Microsoft® Windows compatible 32-bit add-in for Microsoft® Excel that provides callable functions for Density, CTPL and Fp. These functions allow calculating density at base conditions or at alternate conditions, CTPL correction factor used to transform volume and density data to base or desired conditions and the scaled compensation factor for transformation from alternate to base conditions or from observed to base conditions for generalized crude oils, refined products and lubricating oils. They support the following process variables: Density (API gravity, relative density & kg/m^3), Temperature (°F & °C) and Pressure (psig, Bar & kPa).

To order the Add-in, Contact Flow-Cal, Inc. at +1 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

XL Add-in—runs on a single standalone computer with no network access Price: $750.00

XL Add-in—installed on less than 15 standalone computers or ran on a network with less than 15 nodes | Price: $5,000.00

XL Add-in—installed on less than 50 standalone computers or ran on a network with less than 50 nodes | Price: $7,500.00

XL Add-in—installed on an unlimited number of standalone computers or ran on a network with unlimited nodes | Price: $11,000.00

Chapter 11.1
Dynamic Link Library (DLL)

The Dynamic Link Library (DLL) is compiled from source code written in the C programming language. The DLL provides subroutines that can be called from applications written in C or other programming languages. These subroutines are subdivided into three groups (density, volume correction factors and scaled compressibility factor) for generalized crude oils, refined products and lubricating oils.

- The density subroutines have two sets of density functions allowing calculations at base conditions or at alternate conditions.
- The volume correction factor subroutines calculate a CTPL, CTL & CPL which are used to transform volume and density data to base or desired conditions
- The scaled compressibility factor subroutines will convert from alternate to base conditions or from observed to base conditions.

The DLL supports the following process units, densities in API gravity, relative density & kg/m^3, temperatures in °F & °C and pressures in psig, Bar & kPa. This version is compatible with and can coexist with the 1980 version DLL.

To order the DLL, Contact Flow-Cal, Inc. at +1 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

DLL—runs on a single standalone computer with no network access | Price: $2,000.00

DLL—installed on less than 15 standalone computers or ran on a network with less than 15 nodes | Price: $7,500.00

DLL—installed on less than 50 standalone computers or ran on a network with less than 50 nodes | Price: $15,000.00

DLL—installed on an unlimited number of standalone computers or ran on a network with unlimited nodes | Price: $20,000.00

DLL—compiled as part of an application for distribution (software distributor) | Price: $30,000.00

Chapter 11.1
Source Code

ANSI C-code used to compile the DLLs. The source code may be compiled into user programs to calculate temperature and pressure volume correction factors for generalized crude oils, refined products, and lubricating oils.

NOTE: An experienced C programmer will be needed to implement the C-Code subroutines. The API does not directly provide technical support for the C-Code; however, a support program is available from Flow-Cal, Inc.

To order the C-Code Subroutines, Contact Flow-Cal, Inc. at +1 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

C-Code—compiled to run on a standalone application with no network access | Price: $3,000.00

C-Code—compiled to run on a network with less than 15 nodes | Price: $11,000.00

C-Code—compiled to run on a network with less than 50 nodes | Price: $22,500.00

C-Code—compiled to run on a network with unlimited nodes | Price: $30,000.00

C-Code—compiled as part of an application for distribution (software distributor) | Price: $45,000.00

Chapter 11.1
Source Code, DLL & XL Add-in—Combined

To order the C-Code Subroutines, Add-in and DLL, Contact Flow-Cal, Inc. at +1 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

C-Code, DLL and XL Add In—compiled to run on a standalone application with no network access | Price: $4,000.00

C-Code, DLL and XL Add-in—compiled to run on a network with less than 15 nodes | Price: $14,000.00

C-Code, DLL and XL Add-in—compiled to run on a network with less than 50 nodes | Price: $27,500.00

C-Code, DLL and XL Add-in—compiled to run on a network with unlimited nodes | Price: $37,000.00

C-Code, DLL and XL Add-in—compiled as part of an application for distribution (software distributor) | Price: $55,000.00

Chapter 11.2.2
Compressibility Factors for Hydrocarbons: 0.350–0.637 Relative Density (60 °F/60 °F) and –50 °F to 140 °F Metering Temperature

Provides tables to correct hydrocarbon volumes metered under pressure for the metered temperature. Contains compressibility factors related to the meter temperature and relative density (60 °F/60 °F) of the metered material.

2nd Edition | October 1986 | Reaffirmed: December 1, 2007
Product Number: H27307 | Price: $166.00

Chapter 11.2.2M
Compressibility Factors for Hydrocarbons: 350–637 Kilograms per Cubic Meter Density (15 °C) and –46 °C to 60 °C Metering Temperature

Provides tables to correct hydrocarbon volumes metered under pressure to corresponding volumes at equilibrium pressure for the metered temperature. The standard contains compressibility factors related to the meter temperature and density (15 °C) of the metered material. Pages: 264

1st Edition | October 1986 | Reaffirmed: December 1, 2007
Product Number: H27309 | Price: $166.00

Chapter 11.2
Data File of Chapters 11.2.2 and 11.2.2M

This package includes a data file of tables found in Chapters 11.2.2 and 11.2.2M. The tables, presented in both U.S. customary (USC) and metric (SI) units, cover compressibility factors for light hydrocarbons.

1st Edition | October 1986 | Product Number: H27320 | Price: $287.00

Chapter 11.2.4
Temperature Correction for the Volumes of NGL and LPG Tables 23E, 24E, 53E, 54E, 59E, 60E

This publication is an updated version of TP-25. The actual Standard represented by this report consists of the explicit implementation procedures. Sample tables, flow charts, and specific examples created from a computerized version of these implementation procedures are included. The examples are to provide guides and checkpoints for those who wish to implement a computerized procedure to represent the Standard, however these are not part of the actual Standard. This standard covers a 60 °F relative Density range of 0.3500 to 0.6880 which nominally equates to a density at 15 °C of 351.7 to 687.8 kg/m^3 and a density at 20 °C of 331.7 to 686.6 kg/m^3. The temperature range of this Standard is 50.8 to 199.4 °F (–46 to 93 °C). At all conditions, the pressure is assumed to be at saturation conditions (also known as bubble point or saturation vapor pressure). Pages: 149

1st Edition | September 2007 | Product Number: H1102041 | Price: $174.00

Chapter 11.2.5
A Simplified Vapor Pressure Correlation for Commercial NGLs
(supersedes the Addendum to Chapter 11.2.2-1994)

Methods used for calculation of the correction factor for pressure effects such as API *MPMS* Chapter 11.2.11984 (now superseded by Chapter 11.1-2004) and *MPMS* Chapter 11.2.2-1986 require knowledge of the equilibrium bubble point pressure (vapor pressure) at the measured conditions. However, the vapor pressure of the process liquid is generally not measured. The vapor pressure can also be calculated form compositional information, but the composition is not always measured for natural gas liquids, NGLs. Therefore, a correlation for the vapor pressure of NGLs is based upon normally measured properties is required and is documented in this publication. Pages: 27

1st Edition | October 2007 | Product Number: H1102051 | Price: $87.00

Chapter 11.3.2.1
Ethylene Density

An electronic FORTRAN Source Code text file on CD-ROM that will produce either a density (pounds/ft^3) or a compressibility factor for vapor phase ethylene over the temperature range from 65 °F to 167 °F and the pressure range from 200 to 2100 psia. A documentation file is also included.

January 1974 | Reaffirmed: March 1, 2008
Product Number: H25650 | Price: $287.00

Chapter 11.3.3.2
Propylene Compressibility

An electronic FORTRAN Source Code text file on CD-ROM that will produce a table of values applicable to liquid propylene in the following ranges: temperature, 30 °F to 165 °F; and saturation pressure to 1600 psia. It computes the following two values: density (pounds/ft^3) at flowing temperature and pressure, and ratio of density at flowing conditions to density at 60 °F and saturation pressure. A documentation file is also included.

January 1974 | Reaffirmed: July 23, 2007
Product Number: H25656 | Price: $287.00

Chapter 11.4.1
Properties of Reference Materials
Part 1—Density of Water and Water Volume Correction Factors for Calibration of Volumetric Provers
(replaces Chapters 11.2.3 and 11.2.3M)

This chapter specifies the density of water to be used in all applicable API *MPMS* Standards. It also specifies the volume correction factor equation for water and demonstrates its use for water calibration of volumetric provers. Pages: 14

1st Edition | December 2003 | Reaffirmed: August 20, 2008
Product Number: H11411 | Price: $51.00

Chapter 11.5 ■
Density/Weight/Volume Intraconversion
[replaces Chapter 11.1-1980 Volumes XI/XII (ASTM D1250-80, IP 200/80)]

These intraconversion tables are applicable to all crude oils, petroleum products, and petrochemicals. These standards are intended for application to bulk liquid quantities. Chapters 11.5, Parts 1 to 3 are available collectively on one CD-ROM.

1st Edition | March 2009 | Product Number: H1105CD | Price: $240.00

Part 1—Conversions of API Gravity at 60 °F

Provides implementation procedures for conversion of API gravity at 60 °F to equivalent densities in both in vacuo and in air values. This standard gives the following equivalents for any value of API gravity at 60 °F:

- relative density at 60 °F (old Table 3);
- absolute density at 60 °F;
- absolute density at 15 °C (old Table 3);
- pounds per U.S. gallon at 60 °F in vacuo and in air (old Table 8);
- U.S. gallons per pound at 60 °F in vacuo and in air (old Table 8);
- short tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 9);
- U.S. gallons per short ton at 60 °F in vacuo and in air (old Table 10);
- short tons per barrel at 60 °F in vacuo and in air (old Table 9);
- barrels per short ton at 60 °F in vacuo and in air (old Table 10);
- long tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 11);
- U.S. gallons per long ton at 60 °F in vacuo and in air (old Table 12);
- long tons per barrel at 60 °F in vacuo and in air (old Table 11);
- barrels per long ton at 60 °F in vacuo and in air (old Table 12);
- metric tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 13);
- metric tons per barrel at 60 °F in vacuo and in air (old Table 13);
- barrels per metric ton at 60 °F in vacuo and in air;
- cubic metres per short ton at 15 °C in vacuo and in air (old Table 14);
- cubic metres per long ton at 15 °C in vacuo and in air (old Table 14).

While not related to API gravity, the following are included for user convenience:

- U.S. gallons at 60 °F to litres at 15 °C (old Table 4);
- barrels at 60 °F to litres at 15 °C (old Table 4).

Part 2—Conversions for Relative Density (60/60 °F)

Provides implementation procedures for conversion of relative density (60/60 °F) to equivalent densities in both in vacuo and in air values. This standard gives the following equivalents for any value of relative density (60/60 °F):

- API gravity at 60 °F (old Table 21);
- absolute density at 60 °F;
- absolute density at 15 °F (old Table 21);
- pounds per U.S. gallon at 60 °F in and in air (old Table 26);
- U.S. gallons per pound at 60 °F in vacuo and in air (old Table 26);
- short tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 27);
- U.S. gallons per short ton at 60 °F in vacuo and in air (old Table 28);
- short tons per barrel at 60 °F in vacuo and in air (old Table 27);
- barrels per short ton at 60 °F in vacuo and in air (old Table 28);
- long tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 29);
- U.S. gallons per long ton at 60 °F in vacuo and in air (old Table 30);
- long tons per barrel at 60 °F in vacuo and in air (old Table 29);
- barrels per long ton at 60 °F in vacuo and in air (old Table 30);
- metric tons per 1000 U.S. gallons at 60 °F in vacuo and in air;
- metric tons per barrel at 60 °F in vacuo and in air;

- barrels per metric ton at 60 °F in vacuo and in air;
- cubic metres per short ton at 15 °C in vacuo and in air (old Table 31);
- cubic metres per long ton at 15 °C in vacuo and in air (old Table 31).

While not related to relative density, the following are included for user convenience:

- U.S. gallons at 60 °F to litres at 15 °C (old Table 22);
- barrels at 60 °F to litres at 15 °C (old Table 22, Table 52).

Part 3—Conversions for Absolute Density at 15 °C

Provides implementation procedures for conversion of absolute density at 15 °C to equivalent densities in both in vacuo and in air values. This standard gives the following equivalents for any value of absolute density at 15 °C:

- relative density at 15 °C;
- absolute density at 60 °F;
- relative density at 60 °F (old Table 51);
- API gravity at 60 °F (old Table 51);
- density at 15 °C (similar to old Table 56);
- conversion of apparent density at 15 °C to absolute density at 15 °C;
- cubic metres per metric ton at 15 °C in vacuo and in air (similar to old Table 56);
- cubic metres per short ton at 15 °C in vacuo and in air;
- cubic metres per long ton at 15 °C in vacuo and in air;
- pounds per U.S. gallon at 60 °F in vacuo and in air;
- U.S. gallons per pound at 60 °F in vacuo and in air;
- short tons per 1000 litres (cubic metres) at 15 °C in vacuo and in air (old Table 57);
- short tons per 1000 U.S. gallons at 60 °F in vacuo and in air;
- U.S. gallons per short ton at 60 °F in vacuo and in air;
- short tons per barrel at 60 °F in vacuo and in air;
- barrels per short ton at 60 °F in vacuo and in air;
- long tons per 1000 litres (cubic metres) at 15 °C in vacuo and in air (old Table 57);
- U.S. gallons per metric ton at 60 °F in vacuo and in air (old Table 58);
- barrels per metric ton at 60 °F in vacuo and in air (old Table 58);
- long tons per 1000 U.S. gallons at 60 °F in vacuo and in air;
- U.S. gallons per long ton at 60 °F in vacuo and in air;
- long tons per barrel at 60 °F in vacuo and in air;
- barrels per long ton at 60 °F in vacuo and in air.

While not related to relative density, the following are included for user convenience:

- litres at 15 °C to U.S. gallons at 60 °F;
- cubic metres at 15 °C to barrels at 60 °F (old Table 52).

1st Edition | March 2009 | Product Number: H1105CD | Price: $240.00

Chapter 12
Calculation of Petroleum Quantities

Describes the standard procedures for calculating net standard volumes, including the application of correction factors and the importance of significant figures. The purpose of standardizing the calculation procedure is to achieve the same result regardless of which person or computer does the calculating.

Chapter 12.1.1
Calculation of Static Petroleum Quantities
Part 1—Upright Cylindrical Tanks and Marine Vessels
(includes Chapter 12 Addendum dated August 2007)

Guides the user through the steps necessary to calculate static liquid quantities, at atmospheric conditions, in upright, cylindrical tanks and marine tank vessels. The standard defines terms employed in the calculation of static petroleum quantities. The standard also specifies equations that allow the values of some correction factors to be computed. Fundamental to this process is the understanding that in order for different parties to be able to reconcile volumes, they must start with the same basic information (tank capacity table, levels, temperatures, and so forth) regardless of whether the information is gathered automatically or manually. This standard does not address the calculation of clingage, nonliquid material, small quantities (such as onboard quantities, quantities remaining on board, and wedge formula, where material is not touching all bulkheads on marine vessels), and vapor space calculations. Pages: 34

2nd Edition | November 2001 | Reaffirmed: February 28, 2008
Product Number: H12112 | Price: $91.00

Chapter 12.1.1-SP
Calculation of Static Petroleum Quantities
Part 1—Upright Cylindrical Tanks and Marine Vessels—Spanish

The Spanish translation of Chapter 12.1.1.

2nd Edition | October 2001 | Product Number: H120101SP | Price: $96.00

Chapter 12.1.2
Calculation of Static Petroleum Quantities
Part 2—Calculation Procedures or Tank Cars
(includes Chapter 12 Addendum dated August 2007)

Describes the standardized method for calculating target loading quantities and actual loading quantities of liquids in tank cars. Also explained are the factors required for the calculations. This information is applicable to all crude oils, petroleum products, and petrochemicals (including LPGs and other liquefied gases) transported by rail tank car. It does not cover any products loaded or measured as solids. It defines the terms required to understand the calculations, and provides instructions for their use; includes thirteen calculation examples in Appendix E. Pages: 39

1st Edition | May 2003 | Product Number: H12121 | Price: $107.00

Chapter 12.2.1
Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volume Correction Factors
Part 1—Introduction
(includes Chapter 12 Addendum dated August 2007 and Errata dated July 2009)

Provides the general introduction of this standard which is divided into five parts, each published separately. The base (reference or standard) volumetric determination of metered quantities is discussed along with the general terms required for solution of the various equations. General rules for rounding of numbers, including field data, intermediate calculations numbers, and discrimination levels are specified. Pages: 23

2nd Edition | May 1995 | Reaffirmed: February 27, 2009
Product Number: H12021 | Price: $105.00

Chapter 12.2.2
Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors
Part 2—Measurement Tickets
(includes Chapter 12 Addendum dated August 2007)

Provides standardized calculation methods for the quantification of liquids and the determination of base prover volumes under defined conditions, regardless of the point of origin or destination or the units of measure required by governmental customs or statute. The publication rigorously specifies the equations for computing correction factors, rules for rounding, calculational sequence, and discrimination levels to be employed in the calculations. Pages: 18

3rd Edition | June 2003 | Product Number: H12223 | Price: $98.00

Chapter 12.2.3
Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors
Part 3—Proving Reports
(includes Chapter 12 Addendum dated August 2007)

Consolidates and standardizes calculations for metering petroleum liquids using turbine or displacement meters and clarifies terms and expressions by eliminating local variations among terms. This standard provides calculation methods for the determination of meter factors under defined conditions, regardless of the point of origin or destination or units of measure required by governmental customs or statute. This document specifies the equations for computing correction factors, including the calculation sequence, discrimination levels, and rules for rounding. Pages: 59

1st Edition | October 1998 | Reaffirmed: March 6, 2009
Product Number: H12023 | Price: $115.00

Chapter 12.2.4
Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volume Correction Factors
Part 4—Calculation of Base Prover Volumes by Waterdraw Method
(includes Chapter 12 Addendum dated August 2007 and Errata dated July 2009)

Provides a standardized calculation method to determine a base prover volume under defined conditions. Specifically, this standard discusses the calculation procedures for the waterdraw calibration method, which is one of several different procedures used to determine Base Prover Volume (BPV) of a displacement prover. Pages: 58

1st Edition | December 1997 | Reaffirmed: March 9, 2009
Product Number: H12024 | Price: $118.00

Chapter 12.2.5
Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors
Part 5—Base Prover Volume Using Master Meter Method
(includes Chapter 12 Addendum dated August 2007 and Errata dated July 2009)

Provides standardized calculation methods for the quantification of liquids and the determination of base prover volumes under defined conditions, regardless of the point of origin or destination or units of measure required by governmental customs or statute. The criteria contained in this document allow different entities using various computer languages on different computer hardware (or manual calculations) to arrive at identical results using the same standardized input data. Pages: 108

2nd Edition | September 2001 | Reaffirmed: November 1, 2006
Product Number: H12025 | Price: $165.00

Chapter 12.3
Calculation of Volumetric Shrinkage From Blending Light Hydrocarbons with Crude Oil
(includes Chapter 12 Addendum dated August 2007)

Provides background, theory, calculation examples, and tables to correct for volumetric shrinkage resulting when blending volatile hydrocarbons with crude oil. The tables are entered with density differentials at Standard conditions and percentage light hydrocarbon in total mix. This standard supersedes and replaces API Bulletin 2509C, Second Edition, 1967. Pages: 110

1st Edition | July 1996 | Reaffirmed: March 1, 2006
Product Number: H12031 | Price: $86.00

Chapter 13
Statistical Aspects of Measuring and Sampling

The more accurate petroleum measurement becomes, the more its practitioners stand in need of statistical methods to express residual uncertainties. This chapter covers the application of statistical methods to petroleum measurement and sampling.

Chapter 13.1
Statistical Concepts and Procedures in Measurement

Designed to help those who make measurement of bulk oil quantities improve the value of their result statement by making proper estimates of the uncertainty or probable error involved in measurements. Pages: 17

1st Edition | June 1985 | Reaffirmed: March 1, 2006
Product Number: H30321 | Price: $80.00

Chapter 13.2
Statistical Methods of Evaluating Meter Proving Data

Addresses procedures for evaluating any meter's performance where meter proving factors are developed in accordance with Chapter 12.2. The data in examples used in this chapter are intended to be typical of custody transfer operations of low-vapor-pressure fluids using displacement or turbine meters in accordance with Chapters 4, 5, and 6 of API's *Manual of Petroleum Measurement Standards*. However, the procedures in Chapter 13.2 can be used for noncustody transfer metering applications and for custody transfer metering of high -vapor-pressure and gaseous fluids where meter proving data are available. Pages: 41

1st Edition | November 1994 | Reaffirmed: March 1, 2006
Product Number: H13021 | Price: $94.00

Chapter 14
Natural Gas Fluids Measurement

This chapter standardizes practices for measuring, sampling and testing natural gas fluids.

Chapter 14.1
Collecting and Handling of Natural Gas Samples for Custody Transfer

Concentrates on proper sampling systems and procedures. It recognizes the critical impact of hydrocarbon dew point consideration to the overall accuracy and success of these practices and procedures. Analyses of gas samples are used for many purposes and are applied to various calculations, some of which have an impact on the accuracy of custody transfer calculations (quantity and quality). Pages: 58

6th Edition | February 2006 | Product Number: H14010 | Price: $176.00

Chapter 14.2
Compressibility Factors of Natural Gas and Other Related Hydrocarbon Gases
(AGA Report No. 8)(GPA 8185-90)

Presents detailed information for precise computations of compressibility factors and densities for natural gas and other hydrocarbon gases. Also included are calculation uncertainty estimations and FORTRAN computer program listings.

2nd Edition | August 1994 | Reaffirmed: March 1, 2006

Order from American Gas Association
400 N. Capitol Street, N.W. | Washington, DC 20001 | (202) 824-7000

Chapter 14.3.1
Concentric, Square-Edged Orifice Meters
Part 1—General Equations and Uncertainty Guidelines
(includes Errata dated July 1991 and June 1993)
(ANSI/API MPMS 14.3.1-2003) (AGA Report No. 3, Part 1)
(GPA 8185-90, Part 1)

Provides the basic equations and uncertainty statements for computing the flow through orifice meters. In Part 1, the traditional basic orifice factor and Reynolds number factor found in the 1985 edition have been replaced with a more fundamental coefficient of discharge that is a function of line size, beta radio, and pipe Reynolds number. The upstream expansion factor is not changed from the 1985 edition. The downstream expansion factor has been reanalyzed to include compressibility. Although each part of the document can be used independently for many applications, users with natural gas applications should review Parts 3 and 4 before implementing Part 1. Pages: 51

3rd Edition | September 1990 | Reaffirmed: February 1, 2009
Product Number: H30350 | Price: $159.00

Chapter 14.3.2
Concentric, Square-Edged Orifice Meters
Part 2—Specification and Installation Requirements
(ANSI/API MPMS 14.3.2-2000)
(AGA Report No. 3, Part 2) (GPA 8185-00, Part 2)

Outlines the specification and installation requirements for the measurement of single-phase, homogeneous Newtonian fluids using concentric, square-edged, flange-tapped orifice meters. It provides specifications for the construction and installation of orifice plates, meter tubes, and associated fittings when designing metering facilities using orifice meters. Pages: 70

4th Edition | April 2000 | Reaffirmed: March 1, 2006
Product Number: H14324 | Price: $182.00

Chapter 14.3.3
Concentric, Square-Edged Orifice Meters
Part 3—Natural Gas Applications
(includes Errata dated March 1994)
(ANSI/API MPMS 14.3.3-2003) (AGA Report No. 3, Part 3)
(GPA 8185, Part 3)

Developed as an application guide for the calculation of natural gas flow through a flange-tapped, concentric orifice meter, using the inch-pound system of units. It also provides practical guidelines for applying Chapter 14.3, Parts 1 and 2, to the measurement of natural gas. Pages: 103

3rd Edition | August 1992 | Reaffirmed: February 2, 2009
Product Number: H30353 | Price: $159.00

Chapter 14.3.4
Concentric, Square-Edged Orifice Meters
Part 4—Background, Development, Implementation Procedures and Subroutine Documentation
(AGA Report No. 3, Part 4) (GPA 8185, Part 4)

Describes the background and development of the equation for the coefficient of discharge of flange-tapped square-edged concentric orifice meters and recommends a flow rate calculation procedure. The recommended procedures provide consistent computational results for the quantification of fluid flow under defined conditions, regardless of the point of origin or destination, or the units of measure required by governmental customs or statute. The procedures allow different users with different computer languages on different computing hardware to arrive at almost identical results using the same standardized input data. Pages: 138

3rd Edition | November 1992 | Reaffirmed: March 1, 2006
Product Number: H30354 | Price: $159.00

Chapter 14.4
Converting Mass of Natural Gas Liquids and Vapors to Equivalent Liquid Volumes
(GPA 8173-91)

Prescribes a method for converting the measured mass of natural gas liquids or natural gas vapors at operating conditions to equivalent liquid volume of the components at 60 °F and equivalent liquid volumes of the components at 15 °C and equilibrium pressure for SI units. Pages: 3

1st Edition | April 1991 | Reaffirmed: March 1, 2006
Product Number: H30344 | Price: $57.00

Chapter 14.5 ■
Calculation of Gross Heating Value, Relative Density, Compressibility and Theoretical Hydrocarbon Liquid Content for Natural Gas Mixtures for Custody Transfer
(ANSI/API MPMS 14.5-2009) (GPA 8172-09)

Presents procedures for calculating, at base conditions from composition, the following properties of natural gas mixtures: gross heating value, relative density (real and ideal), compressibility factor and theoretical hydrocarbon liquid content which in the U.S. is typically expressed as GPM, the abbreviation for gallons of liquid per thousand cubic feet of gas. Rigorous calculation of the effect of water upon these calculations is complicated. Because this document relates primarily to custody transfer, the water effect included is an acceptable contractual calculation. Annex A of this standard contains a detailed investigation of the effect of water and detailed derivations of the equations presented in the standard. Pages: 41

3rd Edition | January 2009 | Product Number: H140503 | Price: $70.00

Chapter 14.6
Continuous Density Measurement
(includes Errata dated August 1998)
(ANSI/API MPMS 14.6-1991)

Provides criteria and procedures for designing, installing, and operating continuous density measurement systems for Newtonian fluids in the petroleum, chemical, and natural gas industries. The application of this standard is limited to clean, homogeneous, single-phase liquids or supercritical fluids. The procedures and criteria in this standard have been successfully applied to fluids whose flowing density is greater than 0.3 grams per cubic centimeter at operating conditions of 60 °F (15.6 °C) and saturation pressure. The intent of the standard is to provide the user with a density accuracy of 0.10 % for most applications. The errata provides editorial clarification regarding conversion factors and variables used in various calculation equations. Pages: 51

2nd Edition | April 1991 | Reaffirmed: March 1, 2006
Product Number: H30346 | Price: $128.00

Chapter 14.7 ■
Mass Measurement of Natural Gas Liquids
(GPA 8182-03)

Serves as a reference for the selection, design, installation, operation and maintenance of single-phase dynamic liquid mass measurement systems that operate in the 350 to 688 kg/m^3 (0.350 to 0.689 relative density at 60 °F) density range. The mass measurement systems within the scope of this document include inferred mass measurement, where volume at flowing conditions is combined with density at similar conditions to result in measured mass, as well as Coriolis mass measurement. Liquids with density below 350 and above 688 kg/m^3 (below 0.350 and above 0.689 relative density at 60 °F) and cryogenic fluids (colder than approximately –50 °F) are excluded from the scope of this document, but the principles described herein may apply to such streams. Sampling equipment and techniques are covered including standards for analytical methods used to determine the composition of the sampled product. Equations of state and correlations used to calculate the density of the product are discussed. The standard used to convert mass to equivalent liquid volumes of components is also discussed. Pages: 6

3rd Edition | October 2009 | Product Number: H140703 | Price: $57.00

Chapter 14.8
Liquefied Petroleum Gas Measurement

Describes dynamic and static metering systems used to measure liquefied petroleum gas in the density range of 0.30 to 0.70 grams per cubic centimeter. This edition revises the February 1983 version of the standard to incorporate the 1992 version of the Chapter 14.3 orifice meter discharge coefficient equation and revises and simplifies the mass flow rate sample calculations. Pages: 20

2nd Edition | July 1997 | Reaffirmed: March 1, 2006
Product Number: H14082 | Price: $94.00

Chapter 14.9
Measurement of Natural Gas by Coriolis Meter
(AGA Report No. 11-2003)

Developed to assist designers and users in operating, calibrating, installing, maintaining and verifying Coriolis flow meteres used for natural gas flow measurement.

1st Edition | January 2003

Order from the American Gas Association
500 N. Capitol Street, N.W. | Washington, DC 20001 | (202) 824-7000

Chapter 14.10
Measurement of Flow to Flares

Addresses measurement of flow to flares, and includes:

- Application considerations.
- Selection criteria and other considerations for flare meters and related instrumentation.
- Installation considerations.
- Limitations of flare measurement technologies.
- Calibration.
- Operation.
- Uncertainty and propagation of error.
- Calculations.

The scope of this standard does not include analytical instrumentation. Pages: 54

1st Edition | July 2007 | Product Number: H140101 | Price: $103.00

Chapter 15
Guidelines for Use of the International System of Units (SI) in the Petroleum and Allied Industries

Specifies the API preferred units for quantities involved in petroleum industry measurements and indicates factors for conversion of quantities expressed in customary units to the API-preferred metric units. The quantities that comprise the tables are grouped into convenient categories related to their use. They were chosen to meet the needs of the many and varied aspects of the petroleum industry but also should be useful in similar process industries. Pages: 43

3rd Edition | December 2001 | Reaffirmed: May 1, 2007
Product Number: H15003 | Price: $111.00

Chapter 16
Measurement of Hydrocarbon Fluids by Weight or Mass

This chapter covers the static and dynamic measurement of hydrocarbon fluids by weight or mass.

Chapter 16.2
Mass Measurement of Liquid Hydrocarbons in Vertical Cylindrical Storage Tanks by Hydrostatic Tank Gauging

Provides guidance on the installation, commissioning, maintenance, validation, and calibration of hydrostatic tank gauging (HTG) systems for the direct measurement of static mass of liquid hydrocarbons in storage tanks. This first edition is applicable to hydrostatic tank gauging systems that use pressure sensors with one port open to the atmosphere. It is also applicable for use on vertical cylindrical atmospheric storage tanks with either fixed or floating roofs. (Based entirely on ISO 11223-1, Part 1) Pages: 20

1st Edition | November 1994 | Reaffirmed: February 1, 2007
Product Number: H16021 | Price: $94.00

Chapter 17
Marine Measurement

This chapter provides guidelines for the measurement and reporting of crude oil or petroleum product transfers by shore terminal operators, vessel personnel, and other parties involved in marine cargo transfer measurement and accountability operations.

Chapter 17.1
Guidelines for Marine Cargo Inspection

Encourages uniform inspection practices for marine petroleum cargo quantity and quality control. These guidelines specify the policy and minimum recommended practices for manual and automatic measurement, sampling and accounting for bulk quantities of crude oil (including spiked, blended, and reconstituted crude oil) and petroleum products that are transferred from one port to another on marine vessels. Activities described include actions by producers, buyers, sellers, shore terminal operators, vessel owners and their crews, customs authorities, independent inspectors and other parties with an interest in oil measurement. Use also will simplify the making of agreements for transferring volumes of petroleum cargoes and will help ensure that the agreements can be clearly interpreted and executed between parties. Included in this text are sample forms designed to provide a standard comprehensive format to record and report essential data obtained during the marine cargo inspection procedure.

5th Edition | March 2008 | Product Number: H170105 | Price: $125.00

Chapter 17.1-SP
Guidelines for Marine Cargo Inspection—Spanish

The Spanish translation of Chapter 17.1.

5th Edition | March 2008 | Product Number: H170105S | Price: $131.00

Chapter 17.2
Measurement of Cargoes on Board Tank Vessels
(includes Errata dated April 2000)

Covers manual portable measurement units (PMUs) through deck-fitted vapor control valves (VCVs) and fixed automatic tank gauge (ATG) systems for use when a marine vessel's cargo tanks may not be open to the atmosphere. It establishes the procedures for obtaining the level measurements of cargo, free water, and onboard quantity/remaining onboard (OBQ/ROB), as well as taking the temperatures and samples required for the marine custody transfer of bulk liquid petroleum cargoes under closed or restricted system measurement conditions. This standard is not intended for use with pressurized or refrigerated cargoes such as LPG and LNG. Pages: 19

2nd Edition | May 1999 | Reaffirmed: October 1, 2006
Product Number: H17022 | Price: $128.00

Chapter 17.2-SP
Measurement of Cargoes on Board Tank Vessels—Spanish

The Spanish translation of Chapter 17.2.

2nd Edition | May 1999 | Product Number: H1702SP | Price: $134.00

Chapter 17.3
Guidelines for Identification of the Source of Free Waters Associated With Marine Petroleum Cargo Movements
(includes Errata dated November 1992)

Provides guidelines for identifying the source of free waters associated with marine petroleum cargo movements. The presence of free water is a factor in marine custody transfers of bulk petroleum, especially in the case of crude

oil cargoes. This standard recommends the water samples and volumes to be taken, the containers to be used, the care and distribution of the samples, and the analytical procedures of use in identifying sources of free water associated with marine petroleum cargoes. Pages: 26

1st Edition | April 1992 | Reaffirmed: September 2, 2009
Product Number: H30407 | Price: $105.00

Chapter 17.4
Method for Quantification of Small Volumes on Marine Vessels (OBQ/ROB)
(includes Errata dated September 2004)

Provides a method for determining the small volumes of On-Board Quantity (OBQ) prior to loading or material Remaining On-Board (ROB) a vessel on completion of discharge. This standard applies only to quantification by manual gauging of small volumes on marine vessels prior to loading or upon completion of discharge. The OBQ/ROB material may include any combination of water, oil, slops, oil residue, oil/water emulsion, and sediment, present in the vessel's cargo tanks, void spaces, and pipelines. It does not address clingage, hydrocarbon vapors, cargoes in transit, or cargo pumpability (refer to API *MPMS* Chapter 3). Spanish edition available.

1st Edition | October 1994 | Reaffirmed: August 19, 2009
Product Number: H30410 | Price: $94.00

Chapter 17.4-SP
Method for Quantification of Small Volumes on Marine Vessels (OBQ/ROB)—Spanish

The Spanish translation of Chapter 17.4.

1st Edition | October 1994 | Product Number: H30410SP | Price: $98.00

Chapter 17.5
Guidelines for Cargo Analysis and Reconciliation

Covers guidelines for marine cargo analysis and reconciliation. These guidelines are intended to provide a basis for analyzing and reconciling the quantity differences (gains/losses) resulting from marine custody transfer movement(s) of petroleum and petroleum product cargoes. As such, the guidelines are complementary to, but do not replace, normal inspection procedures. The shipment of petroleum or petroleum products by marine vessels often results in a difference between the load port (Bill of Lading) and discharge port (Outturn) quantities. The objective of cargo analysis and reconciliation is to determine if a marine petroleum shipment results in excessive gain or loss, and if so, to identify the reason(s) for volume differences in an effort to correct petroleum measurement problems. Describes the primary steps for marine cargo analysis and reconciliation. Those steps are the following: (a) Voyage Data Collection; (b) Voyage Data Analysis; and (c) Voyage Summary and Reconciliation. Pages: 25

2nd Edition | November 2003 | Product Number: H17052 | Price: $100.00

Chapter 17.5-SP
Guidelines for Cargo Analysis and Reconciliation—Spanish

The Spanish translation of Chapter 17.5.

2nd Edition | October 2003 | Product Number: H1705SP | Price: $101.00

Chapter 17.6
Guidelines for Determining Fullness of Pipelines Between Vessels and Shore Tanks

Designed to improve the accuracy of custody transfer volumes by establishing recommended procedures for determining the amount of crude oil and petroleum products in shore or vessel pipeline systems before and after the liquid is loaded onto or discharged from marine vessels. These procedures will improve line fill determination activities and assist in making results reproducible at loading and discharge ports. Pages: 20

1st Edition | August 1994 | Reaffirmed: July 1, 2004
Product Number: H17061 | Price: $94.00

Chapter 17.6-SP
Guidelines for Determining Fullness of Pipelines Between Vessels and Shore Tanks—Spanish

The Spanish translation of Chapter 17.6.

1st Edition | August 1994 | Product Number: H17061SP | Price: $98.00

Chapter 17.7
Recommended Practices for Developing Barge Control Factors (Volume Ratio)

Describes the procedure to determine a fixed barge/shore ratio that can be used either when no reliable vessel experience factor (VEF) is available or to verify and validate an existing VEF. The resultant ratio may be used as a "control factor" to ascertain a corrected barge volume for comparison against future shore delivery or receipt volumes. These procedures apply to a single transfer between the shore and the barge, using a light or medium product or chemical with an approximate volume of at least 80% fill of the barge capacity. This publication should be utilized for inland waterway barges. Ocean-going barges should use the VEF method. Pages: 6

1st Edition | September 1995 | Reaffirmed: January 1, 2007
Product Number: H17071 | Price: $94.00

Chapter 17.8
Guidelines for Pre-Loading Inspection of Marine Vessel Cargo Tanks

Outlines procedures for determining that cargo tanks and associated loading equipment of marine vessels are clean and in appropriate condition to receive the intended cargoes. This document provides different levels of inspections for typical cargoes and a recommended format for report preparation. Pages: 14

1st Edition | August 1998 | Reaffirmed: September 25, 2009
Product Number: H17081 | Price: $94.00

Chapter 17.8-SP
Guidelines for Pre-Loading Inspection of Marine Vessel Cargo Tanks—Spanish

The Spanish translation of Chapter 17.8.

1st Edition | August 1998 | Product Number: H1707SP | Price: $98.00

Chapter 17.9
Vessel Experience Factor (VEF)

Provides a recommended practice for the calculation and application of a VEF and provides guidelines for data compilation, data validation, and recommendations on the appropriate use of VEF during custody transfer involving marine tank vessels. It also provides clear guidance on maintenance of quantity data on board the vessel, calculation of VEFs and application of VEFs. The key aim is to provide a single unambiguous figure for VEFL or VEFD and to remove the possibility of any arbitrary inclusion or exclusion of data on the part of the individual(s) performing the final calculation. Also provides instruction for parcel tankers, part cargoes, compartmental VEFs, and vessel-to-vessel transfers. The methods are applicable to liquid bulk cargoes including crude oil, petroleum products, chemicals, and LPGs. Pages: 21

1st Edition | November 2005 | Product Number: H17091 | Price: $146.00

Chapter 17.9-SP
Vessel Experience Factor (VEF)—Spanish

The Spanish translation of Chapter 17.9.

1st Edition | October 2005 | Product Number: H17091SP | Price: $148.00

Chapter 17.10.2
Measurement of Refrigerated and/or Pressurized Cargoes on Board Marine Gas Carriers
Part 2—Liquefied Petroleum and Chemical Gases

Provides guidance to vessel and shore personnel regarding accepted methods for determining quantities of Liquefied Petroleum and Chemical Gas cargoes (excluding LNG) on board refrigerated and/or pressurized carriers. This standard covers all measurement systems commonly used on refrigerated and/or pressurized gas carriers designed to carry those types of cargoes and includes recommended methods for measuring, sampling, documenting and reporting quantities on board these vessels. Pages: 80

1st Edition | October 2007 | Product Number: H1701002 | Price: $109.00

Chapter 17.11 ■
Measurement and Sampling of Cargoes On Board Tank Vessels Using Closed/Restricted Equipment

Provides guidance on the use, maintenance and calibration of restricted and closed measurement and sampling equipment. It also provides guidance on preferred size and positioning for gauging and sampling fittings on vessels. Pages: 17

1st Edition | May 2009 | Product Number: H170111 | Price: $95.00

Chapter 17.12
Procedure for Bulk Liquid Chemical Cargo Inspection by Cargo Inspectors

Provides systematic cargo measurement procedures for use primarily by cargo inspectors and to specify procedures directed at minimizing cargo contamination and losses, in the absence of, or in conjunction with, specific client guidelines. This document should be considered a summary of best practices used within the industry. Pages: 31

1st Edition | September 2008 | Product Number: H170121 | Price: $129.00

Chapter 18
Custody Transfer

This chapter covers application of other measurement standards to unique custody transfer situations.

Chapter 18.1
Measurement Procedures for Crude Oil Gathered From Small Tanks by Truck

Describes procedures to encourage uniform custody transfer measurement and testing practices for crude oil gathered from small tanks (1,000 barrels or less in capacity) by truck. The publication contains recommended steps for manually determining the quantity and quality of crude oil being transferred in trucks under field conditions. This publication is of interest to measurement personnel and crude oil producers and transporters. Pages: 13

2nd Edition | April 1997 | Reaffirmed: February 1, 2007
Product Number: H18012 | Price: $111.00

Chapter 19
Evaporation Loss Measurement

This chapter covers methods for estimating hydrocarbon evaporation losses from various types of tanks. Note that Chapter 19 is not included in the complete set of measurement standards.

Publ 2524
Impact Assessment of New Data on the Validity of American Petroleum Institute Marine Transfer Operation Emission Factors

Consultant CH2M Hill confirmed the validity of the model used in Publ 2514A by comparing emission test data with predictive emission models developed by API, ARCO, and Exxon. The study found that the API model adequately predicts emissions for tanks ranging in size from 17,000 to 35,000 dead weight tons and for tanks being loaded within the lower-48 states. The model does not appear to apply to crude oil loading of tankers in Valdez, Alaska, because of unique local operating conditions. However, no known test data invalidates the model for predicting crude oil loading emissions from carriers smaller than very large crude carriers in the lower48 states. Pages: 194

July 1992 | Product Number: H25240 | Price: $152.00

Publ 2558
Wind Tunnel Testing of External Floating-Roof Storage Tanks

Presents the results of a wind tunnel study to determine the local wind velocities, wind directions, and roof pressures on external floating roof tanks.

1st Edition | June 1993 | Product Number: H25580 | Price: $189.00

TR 2567
Evaporative Loss from Storage Tank Floating Roof Landings

The purpose of this study was to investigate storage tank emissions that may result from landing and subsequently refloating a floating roof. The existing emission factors for floating-roof tanks are based on the assumption that the floating roof is continuously floating on the stored stock liquid. Additional emissions may occur, however, if the tank is emptied such that the floating roof is no longer floating. This study sought to quantify these floating-roof landing loss emissions. Pages: 26

1st Edition | April 2005 | Product Number: H256701 | Price: $102.00

TR 2568
Evaporative Loss from the Cleaning of Storage Tanks

Provides guidance for estimating emissions that result from removing the liquid heel (free-standing stock liquid) and cleaning the remaining deposits of stock liquid mixed with residue and water (sludge) from the bottoms of aboveground storage tanks. The emissions addressed in this report are those that leave the tank during the tank cleaning process. This report does not address:

- the fate of vapors after the have left the tank (other accounting for the efficiency of the control device)
- the fate of sludge after it has left the tank (or emissions that may occur during sludge treatment or disposal), or
- emissions that may be expelled by the vacuum pump of a vacuum truck or suction pump, if such devices are used in the tank cleaning process.

In other words, this report addresses the estimation of the mass of volatile organic compounds that leave the tank as vapor during the tank cleaning process. It does not address emissions that may result from the handling of liquids or sludge after such materials have been removed from the tank. This report is intended to reduce the effort required to generate a good faith estimate of tank cleaning emissions, and to result in more uniformity in the resulting emissions estimates. Pages: 47

1st Edition | November 2007 | Product Number: H25680 | Price: $103.00

TR 2569
Evaporative Loss from Closed-vent Internal Floating-roof Storage Tanks

Addresses evaporative loss from internal floating-roof tanks (IFRTs) with closed vents. When the vents in the fixed roof of an IFRT are closed, rather than open, estimation of emissions is shown to be highly complex. This subject is not covered in other API standards such as the *Manual of Petroleum Measurement Standards* (*MPMS*), Chapter 19.1, which specifically excludes fixed-roof tanks that have an internal floating roof, and *MPMS* Chapter 19.2, which specifically excludes closed internal floating-roof tanks (that is, tanks vented only through a pressure-vacuum relief vent, blanketed with an inert gas, vented to a vapor processing unit, or otherwise restricted from being freely vented). Pages: 26

1st Edition | August 2008 | Product Number: H25690 | Price: $103.00

Chapter 19.1
Evaporative Loss From Fixed-roof Tanks
(includes Addendum August 2008)
(previously Publication 2518)

Contains an improved method for estimating the total evaporative losses or the equivalent atmospheric hydrocarbon emissions from fixed-roof tanks that contain multicomponent hydrocarbon mixture stocks (such as petroleum liquid stocks like crude oils) or single-component hydrocarbon stocks (such as petrochmeical stocks like ethanol).

3rd Edition | March 2002 | Reaffirmed: January 5, 2007
Product Number: H19013 | Price: $122.00

Chapter 19.1A
Evaporation Loss From Low-pressure Tanks
(previously Bulletin 2516)

Breathing, working, and leakage losses encountered in low-pressure tanks (atmospheric to 15 psig) are discussed in this bulletin, which also provides equations for calculating these values. Pages: 12

1st Edition | March 1962 | Reaffirmed: February 1, 2006
Product Number: H25160 | Price: $94.00

Chapter 19.1D
Documentation File for API Manual of Petroleum Measurement Standards Chapter 19.1—Evaporative Loss From Fixed-roof Tanks
(includes Erratum dated June 1994)

Presents information on the development of theoretical equations; comparisons with test data; a sensitivity analysis of the loss equation; and other pertinent information that was developed during the preparation of API *MPMS* Chapter 19.1. Pages: 190

1st Edition | March 1993 | Product Number: H30553 | Price: $166.00

Chapter 19.2
Evaporative Loss From Floating-roof Tanks
(previously Publications 2517 and 2519)

Contains methods for estimating the total evaporative losses or the equivalent atmospheric hydrocarbon emissions from external floating-roof tanks (EFRTs) and freely vented internal floating-roof tanks (IFRTs), as well as for tanks with external-type floating roofs that also have a freely vented fixed roof. This type of tank is referred to as a covered floating-roof tank (CFRT) in this document. Pages: 83

2nd Edition | September 2003 | Reaffirmed: August 15, 2008
Product Number: H19022 | Price: $159.00

Chapter 19.3, Part A
Wind Tunnel Test Method for the Measurement of Deck-fitting Loss Factors for External Floating-roof Tanks

Describes the procedures to establish evaporative loss factors for deck fittings on external floating-roof tanks. The test method involves measuring the weight loss of a test assembly over time. The standard specifies the test apparatus, instruments, test procedures and calculation procedures to be used. It also addresses the variables to be measured, format for reporting the test values and their associated uncertainty. Pages: 27

1st Edition | June 1997 | Reaffirmed: March 1, 2007
Product Number: H1903A | Price: $118.00

Chapter 19.3, Part B
Air Concentration Test Method—Rim-seal Loss Factors for Floating-roof Tanks

Describes the procedures to establish evaporative rim-seal loss factors for rim seals used on external floating-roof tanks. The test method involves passing a controlled flow rate of air through a test chamber that contains a test liquid and a test rim seal, and measuring the concentration of the test liquid vapor in the air streams entering and leaving the test chamber. The standard specifies the test apparatus, instruments, test procedures, and calculation procedures to be used. It also addresses the variables to be measured, format for reporting the test values, and their associated uncertainty. Pages: 30

1st Edition | August 1997 | Reaffirmed: July 24, 2007
Product Number: H1903B | Price: $118.00

Chapter 19.3, Part C
Weight Loss Test Method for the Measurement of Rim-seal Loss Factors for Internal Floating-roof Tanks

Provides a uniform method for measuring evaporative loss from rim seals used on aboveground storage tanks. This information can be utilized to establish product specific loss factors in terms of loss rate and seal gap area. Pages: 29

1st Edition | July 1998 | Reaffirmed: October 1, 2007
Product Number: H1903C | Price: $118.00

Chapter 19.3, Part D
Fugitive Emission Test Method for the Measurement of Deck-seam Loss Factors for Internal Floating-roof Tanks

Establishes a uniform method for measuring evaporative deck-seam loss factors and deck-joint loss factors of mechanically-joined deck seams that are used on internal floating-roof tanks. These deck-seam loss factors and deck-joint loss factors are to be determined in terms of their loss rate at specified pressure differences across the deck seam or deck joint for certification purposes. Pages: 31

1st Edition | June 2001 | Reaffirmed: December 3, 2007
Product Number: H1903D | Price: $118.00

Chapter 19.3, Part E
Weight Loss Test Method for the Measurement of Deck-fitting Loss Factors for Internal Floating-roof Tanks

Describes the test methods to be used to establish evaporative loss factors for deck fittings on internal floating-roof tanks. This chapter specifies the test apparatus, instruments, test procedures, and calculation procedures to be used. The standard also addresses the requirements for reporting test report values. Pages: 30

1st Edition | May 1997 | Reaffirmed: December 3, 2007
Product Number: H1903E | Price: $118.00

Chapter 19.3, Part H
Tank Seals and Fittings Certification—Administration

Provides guidance for the administration of the former API Tank Seals and Fittings Certification Program. The document includes detailed methods for monitoring and analysis of tests conducted on individual devices and describes the steps in the certification process. Pages: 53

1st Edition | March 1998 | Reaffirmed: February 23, 2009
Product Number: H1903H | Price: $118.00

Chapter 19.4
Recommended Practice for Speciation of Evaporative Losses
(includes Errata dated March 2007)

Contains recommended methods for estimating specific organic compound emissions from storage tanks, and marine vessel transfer operations handling multi-component hydrocarbon mixtures (such as crude oils and gasoline) associated with petroleum operations. Pages: 77

2nd Edition | September 2005 | Product Number: H19042 | Price: $118.00

Chapter 19.5 ■
Atmospheric Hydrocarbon Emissions from Marine Vessel Transfer Operations
(formerly Publication 2514A)

Provides methods for estimating evaporative loss from marine vessel transfer operations. Specifically, this standard addresses:

- loading stock into:
  - ship or ocean barges, or
  - shallow draft barges, and
- loading ballast water into ship or ocean barges from which crude oil has been unloaded.

The emission estimates are for uncontrolled loading operations and do not apply to operations using vapor balance or vapor control systems or ballasting of ships with segregated ballast tanks.

This standard does not address evaporative loss for:

- very large crude carriers (VLCCs) or ultra large crude carriers (ULCCs) (unless the saturation factor KS is determined);
- marine vessels employing crude oil washing;
- marine vessel transit loss;
- loading ballast water into marine vessels that, prior to dockside unloading, held anything other than crude oil (unless the saturation factor KS is determined); or
- unloading marine vessels.

This standard supersedes API 2514A, Second Edition, September 1981, which is withdrawn. Pages: 31

1st Edition | September 2009 | Product Number: H19051 | Price: $120.00

Chapter 20
Allocation Measurement of Oil and Natural Gas

Chapter 20.1
Allocation Measurement

Provides design and operating guidelines for liquid and gas allocation measurement systems. Included are recommendations for metering, static measurement, sampling, proving, calibrating and calculating procedures. Pages: 67

1st Edition | August 1993 | Reaffirmed: October 1, 2006
Product Number: H30701 | Price: $105.00

RP 85
Use of Subsea Wet-gas Flowmeters in Allocation Measurement Systems

Presents a recommended allocation methodology that best fits the application, and that equitably accommodates variances in the uncertainty level between meters in the system. It is intended to advise the user on various aspects of the use of subsea wet-gas flowmeters in allocation measurement systems. Marinization, operation, abnormal operation, and meter testing are important topics included here, but, foremost, this document proposes techniques to be used in the allocation of total production to individual contributing streams. Pages: 64

1st Edition | March 2003 | Reaffirmed: August 14, 2008
Product Number: G08501 | Price: $119.00

RP 86
Recommended Practice for Measurement of Multiphase Flow

Addresses how the user measures (multiphase) flow rates of oil, gas, water, and any other fluids that are present in the effluent stream of a single well. This requires the definition not only of the methodology which is to be employed, but also the provision of evidence that this methodology will produce a quality measurement in the intended environment. Most often, this evidence will take the form of a statement of the uncertainty of the measurement, emphasizing how the uncertainty statement was derived. Pages: 78

1st Edition | September 2005 | Product Number: G08601 | Price: $164.00

RP 87
Recommended Practice for Field Analysis of Crude Oil Samples Containing from Two to Fifty Percent Water by Volume

Provides the user with recommended "field" methods of sampling, sample handling and analysis for high water content streams up to 50 % water on a volumetric basis. In particular, this RP was developed giving consideration to offshore installations (both floating and fixed platforms). These installations are generally subject to motion and vibrations, have minimal laboratory equipment and perform S&W analysis with multi-skilled operations personnel as opposed to laboratory chemists. The techniques described, however, are applicable to onshore locations. Provides design and operating guidelines for sampling, sample handling and analysis for high water content streams, up to 50 % water on a volumetric basis. As a guide, this RP targets a relative accuracy of 5 % of reading up to a maximum of 50 % water content as a qualifier for various methods described herein. For example, the corresponding absolute accuracy for a 10% water content stream is ± 0.5 % and for 20 % water content is ± 1.0 %. Pages: 19

1st Edition | August 2007 | Product Number: G08701 | Price: $87.00

Chapter 21
Flow Measurement Using Electronic Metering Systems

Describes standard practices and minimum specifications for electronic measurement systems used in the measurement and recording of flow parameters. This chapter covers natural gas fluid and petroleum and petroleum product custody transfer applications using industry-recognized primary measurement devices.

Chapter 21.1
Electronic Gas Measurement

Describes the minimum specifications for electronic gas measurement systems used in the measurement and recording of flow parameters of gaseous phase hydrocarbons. Topics covered include definitions, calculational algorithms, data availability, audit and reporting requirements, equipment installation, calibration, and verification and security. Pages: 38

1st Edition | August 1993 | Reaffirmed: July 1, 2005
Product Number: H30730 | Price: $111.00

Chapter 21.2
Electronic Liquid Volume Measurement Using Positive Displacement and Turbine Meters

Provides guidance for the effective use of electronic liquid measurement systems for custody transfer measurement of liquid hydrocarbons under the following conditions. Use of the measurement systems must fall within the scope and field of application of API *MPMS* Chapter 12.2. Guidance applies to systems using turbine or positive displacement meters. Guidance applies to systems using on-line CTL and CPL compensation. The procedures and techniques in *MPMS* Chapter 21.2 are recommended for new measurement applications. This standard provides custody transfer measurement procedures for pipeline and other electronic liquid metering systems including design, selection, use, auditing, reporting, calibration, verification and security. Pages: 60

1st Edition | June 1998 | Reaffirmed: June 1, 2004
Product Number: H21021 | Price: $185.00

Chapter 21.2-A1
Addendum 1 to Flow Measurement Using Electronic Metering Systems, Inferred Mass

1st Edition | August 2000 | Reaffirmed: March 1, 2006
Product Number: H2102A | Price: $58.00

Chapter 22.1
Testing Protocols—General Guidelines for Developing Testing Protocols for Devices Used in the Measurement of Hydrocarbon Fluids

Intended to be a guideline for the development of testing protocols to document the performance characteristics of any of the following hydrocarbon fluid measurement devices:

- Meter or device designed for measurement of flow,
- Instruments or devices for determining hydrocarbon fluid properties,
- Instruments or devices used to monitor and/or record operating conditions,
- Devices or instruments used to monitor, calculate, or measure key parameters in custody transfer applications. Pages: 16

1st Edition | November 2006 | Product Number: H22011 | Price: $73.00

Chapter 22.2
Testing Protocols—Differential Pressure Flow Measurement Devices (supersedes *MPMS* Chapter 5.7)

Defines the testing and reporting protocols for flow measurement devices based on the detection of a pressure differential that is created by the device in a flowing stream. This protocol is designed to supply industry with a comparable description of the capabilities of these devices for the measurement of single-phase fluid flow when they are used under similar operating conditions. The objectives of this Testing Protocol are to:

- Ensure that the user of any differential pressure flow meter knows the performance characteristics of the meter over a range of Reynolds numbers as applicable or defined by tests,
- Facilitate both the understanding and the introduction of new technologies,
- Provide a standardized vehicle for validating manufacturer's performance specifications,
- Provide information about relative performance characteristics of the primary elements of the differential pressure metering devices under standardized testing protocol,
- Quantify the uncertainty of these devices and define the operating and installation conditions for which the stated uncertainties apply. Pages: 29

1st Edition | August 2005 | Product Number: H220201 | Price: $84.00

Std 2560
Reconciliation of Liquid Pipeline Quantities

Provides methodologies for monitoring liquid pipeline loss/gain, and for determining the normal loss/gain level for any given pipeline system. Troubleshooting suggestions are also presented. Pages: 19

1st Edition | December 2003 | Reaffirmed, January 2010
Product Number: H25601 | Price: $76.00

Publ 2566
State of the Art Multiphase Flow Metering

Provides information on multiphase flow metering systems gleaned from more than 150 published documents that are in the public domain. The documentation was prepared from information obtained through mid-2002. It should be noted that the indicated performances data stated in these published documents have not necessarily been verified by an independent body. The listing of these references in the Appendix 2 is intended to provide a comprehensive source of data and information on multiphase metering; the reader needs to carefully review the source of the data in the documents when utilizing the information.

1st Edition | May 2004 | Product Number: H25661 | Price: $123.00

If you have any questions or comments regarding API standards, please visit www.api.org/standards.

GENERAL

RP 1124
Ship, Barge and Terminal Hydrocarbon Vapor Collection Manifolds

This practice is intended to introduce uniformity in vapor manifold arrangements for all tank ships, tank barges, and marine terminals required to install vapor collection systems for the transfer of cargo vapors ashore or between vessels while loading or while ballasting in previously loaded cargo tanks. Pages: 14

1st Edition | March 1991 | Reaffirmed: December 1, 1995
Product Number: E11240 | Price: $63.00

RP 1125
Overfill Control Systems for Tank Barges

Provides guidelines to users and manufacturers on the design and operation of barge loading systems and overfill control systems. Pages: 3

1st Edition | February 1991 | Reaffirmed: December 1, 1995
Product Number: E11250 | Price: $63.00

RP 1127
Marine Vapor Control Training Guidelines

Provides guidelines for developing marine vapor control (also referred to as marine emission control) shore and shipboard training programs, in order to comply with U.S. Coast Guard regulations. These regulations outline vapor collection system safety requirements for the transfer of crude oil, gasoline, and benzene. Pages: 57

1st Edition | November 1993 | Product Number: E11270 | Price: $118.00

RP 1141
Guidelines for Confined Space Entry on Board Tank Ships in the Petroleum Industry

Lacking appropriate safeguards, precautions, and procedures, injury and property damage may result during work in confined spaces on board tank ships. Describes the essential elements needed in a confined space entry program to prevent accidents, injuries, and illnesses. Pages: 16

1st Edition | March 1994 | Product Number: E11411 | Price: $80.00

Quantified Hazards Evaluation of Marine Vapor Recovery Systems

This study provides a basis for designing marine vapor recovery systems utilizing the Chemical Transportation Advisory Committee's recommended design criteria. Pages: 252

August 1989 | Product Number: E12825 | Price: $126.00

CONFERENCE PROCEEDINGS

Proceedings of the 1994 API Tanker Conference
Image—A Global Maritime Mission

Includes the remarks of 6 workshop commentators and 15 technical session addresses covering such topics as the political and financial outlook for the petroleum and tanker industry, maritime training, tanker inspection, and safety and environmental issues. Pages: 235

June 1994 | Product Number: E01994 | Price: $57.00

HEALTH, ENVIRONMENT AND SAFETY

Special Report on Detonation Arrester Safety:
"Mitigation of Explosion Hazards of Marine Vapor Recovery Systems," R.E. White and C.J. Oswald, Southwest Research Institute

October 1992 | Product Number: K19900 | Price: $80.00

SECURITY

API Standard for Third Party Network Connectivity

Provides guidance for implementing secure third-party connections between the information technology systems and network of two companies that have a business relations and a common objective.

The standard will provide suggestions for companies to establish third-party network connections while protecting their individual systems and data from unauthorized access or manipulation. Pages: 36

1st Edition | October 2007 | Product Number: TSTP01 | Price: $87.00

Security Guidance for the Petroleum Industry

API's Second Edition of *Security Guidance for the Petroleum Industry*, is now in use at oil and gas facilities around the world to help managers decide how to deter terrorist attacks. Covering all segments of the industry (production, refining, transportation, pipeline, and marketing), this guidance builds on the existing solid foundation of design and operational regulations, standards, and recommended practices, which relate to facility design and safety, environmental protection, emergency response, and protection from theft and vandalism. Produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies, these guidelines, viewed as a living document, are broadly applicable to facility security in light of September 11, 2001, and provide the starting point for developing security plans at oil and natural gas facilities and operations. Pages: 169

2nd Edition | March 2003 | Product Number: OS0001 | Price: $185.00

Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

The American Petroleum Institute and the National Petrochemical & Refiners Association jointly developed a new methodology for evaluating the likelihood and consequences of terrorist attacks against refineries and petrochemical facilities. *Security Vulnerability Assessment Methodology for Petroleum and Petrochemical Facilities* is designed for companies to use in assessing vulnerabilities and potential damages from different kinds of terrorist attacks. In the post September 11 era, companies have reevaluated and enhanced security at their facilities. The methodology will provide officials with a new analytical tool to determine "the likelihood of an adversary successfully exploiting vulnerability and the resulting degree of damage or impact." This vulnerability assessment methodology was produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies. Pages: 155

October 2004 | Product Number: OSVA02 | Price: $185.00

SECURITY—TRAINING COURSES

Workshop on Industry Security Vulnerability Assessments (SVAs)
www.api-u.org/SVA.html

API presents the leading SVA training for the petroleum, petrochemical and chemical industries. The objective of an SVA is to identify security hazards, threats and vulnerabilities facing a facility and to evaluate the countermeasures to provide for the protection of the public, workers, national interests, the environment, and the company.

Workshop on USCG Regulations for Facility Security Officers (FSOs)
www.api-u.org/FSO.html

Learn about the requirements for Facility Security Officers released in the U.S. Coast Guard (USCG) Final Rule: Part 105, Subpart B. Course materials include a reference CD of over 30 helpful related documents including the regulation, NVICs, API's "Security Vulnerability Assessment for the Petroleum & Petrochemical Industries", and numerous DHS bulletins.

If you have any questions or comments regarding API standards, please visit www.api.org/standards.

NOTE: Free publications with an asterisk are subject to a $10.00 handling charge for each total order, plus actual shipping charges.

GENERAL

Publ 1593
Gasoline Marketing in the United States Today

Provides information on motor fuel and gasoline consumption; U.S. motor fuel distribution; the U.S. gasoline pricing system; motor gasoline prices and taxes; the number/configuration of retail gasoline outlets; and employment/productivity in the retail gasoline distribution industry. Pages: 77

3rd Edition | May 1992 | Product Number: A15930 | Price: $111.00

Publ 1673 ■
Compilation of Air Emission for Petroleum Distribution Dispensing Facilities

This report compiles the most widely accepted, available emission factors and emission estimation techniques for developing air emission estimates from evaporative loss sources of petroleum products at marketing and distribution facilities. These losses can occur from transfer and storage operations and fugitive equipment leaks and spillage. Pages: 29

2nd Edition | July 2009 | Product Number: A16732 | Price: $78.00

AVIATION

API/EI Std 1529
Aviation Fuelling Hose

Addresses performance requirements and test procedures for aircraft fueling hose, hose couplings, and hose assemblies suitable for a broad range of aviation fuel servicing equipment, including fuelers and hydrant servicers.These hoses must be suitable for the full range of aviation fuels specified by ASTM and UK Defense standards. Pages: 30

6th Edition | May 2005 | Product Number: A152906 | Price: $128.00

API/EI RP 1540
Design, Construction, Operation and Maintenance of Aviation Fueling Facilities, IP Model Code of Safe Practice Part 7

Supersedes the 3rd edition of the Institute of Petroleum's Model Code of Safe Practice Part 7 *Airports Safety Code*, published in 1998, and the 2nd edition of the API's Publication 1500 *Storage and Handling of Aviation Fuels at Airports*, which was withdrawn in 1998.

Intended to provide guidance on the siting, layout, design, construction, operation and maintenance of aircraft fuelling facilities, including the design and construction of fuelers, hydrant dispensers and ancillary equipment used in fuelling aircraft. The guidance contained in this edition has been significantly revised from earlier editions to ensure that the safe practices contained herein are equally applicable in all areas of the World; to include adequate guidance for the large number of non-airline type facilities used by retail and consumer-type operations; to include suitable reference to environmental protection controls and facilities that are receiving increased emphasis and regulation in some regions and to ensure that the guidance reflects current levels of knowledge and industry experience Pages: 82

1st Edition | March 2004 | Product Number: A15401 | Price: $206.00

API/EI Std 1542
Identification Markings for Dedicated Aviation Fuel Manufacturing and Distribution Facilities, Airport Storage and Mobile Fuelling Equipment

Provides a system for marking aviation fuel types and grades on fuel-handling installations and equipment at airports and all situations where it is desirable to identify Avgas and Jet Fuel by type and grade. Pages: 34

8th Edition | August 2007 | Product Number: A15427 | Price: $128.00

RP 1543 ■
Documentation, Monitoring and Laboratory Testing of Aviation Fuel during shipment from Refinery to Airport

Aviation fuels pass through a variety of storage and handling facilities from refinery to airport. As aviation fuels are stored and transported in storage and transportation systems where contact with non-aviation products may occur a fuel quality monitoring program is required in addition to equipment, operating, inspection and maintenance standards. The purpose of this practice is to ensure the fuel remains on specification. This recommended practice (RP) was developed to provide guidance on the development of an aviation fuel monitoring and testing program (fuel quality monitoring program) for aviation fuel from point of manufacture to delivery to the airport. "Proper handling" entails documenting and testing aviation fuel quality as product is transported throughout the supply chain to maintain the original product specification. Pages: 25

1st Edition | July 2009 | Product Number: A154301 | Price: $57.00

API/EI 1550
Handbook on Equipment Used for the Maintenance and Delivery of Clean Aviation Fuel

Provides guidance on the equipment used for maintaining and delivering clean aviation fuel. Essential reading for designers of aviation fuel handling systems, those responsible for specifying and purchasing equipment/components for use in aviation fuel handling systems, manufacturers of equipment components (including vehicles) typically used in aviation fuel handling systems, multi-product pipeline operators, pre-airport/pre-airfield depot/terminal operators, operators of aviation fuel supply facilities at airports/airfields, equipment/component operators/users, those responsible for purchasing aviation fuel and other standards developing organizations that may wish to reference API or EI equipment component specifications.

Presents key information in an accessible and use-friendly manner, providing recommended practices based on operational experiences and disseminating key findings from relevant industry research to users of equipment/components. The handbook provides information that may assist in the optimization if aviation fuel handling system components in terms of safety and efficiency. It also provides information on technologies not previously used in aviation fuel handling systems that may be in the near future and highlight the benefits in using combinations of components. Pages: 119

1st Edition | October 2007 | Product Number: A155001 | Price: $289.00

API/EI Spec 1581 ◆
Specification and Qualification Procedures for Aviation Jet Fuel Filter/ Separators

Established the minimum performance and mechanical requirements and the testing and qualification procedures for aviation jet fuel filter/separators with flow rates ranging up to 9500 liters per minute (2400 gallons per minute). The specification also defines procedures to qualify filter/ separators with and without multi-stages.

The most significant amendment to the previous edition is the modification of the test fuel chemistries for Category C, M and M100 testing. This publication is an essential reference for all those involved in the supply of jet fuel to aircraft, and also those involved in the design, manufacture and supply of filter/separator elements.

5th Edition | July 2002 | Reaffirmed: February 15, 2008
Product Number: A15815 | Price: $174.00

API/EI Spec 1582
Specification for Similarity for API/EI 1581 Aviation Jet Fuel Filter/ Separators

Specifies the minimum requirements for a filter/separator system to qualify to API/IP 1581 by similarity. Spec 1582 applies to two-stage (filter and separator) and the filter/separator stages of a multi filter/separator systems. Pages: 20

1st Edition | February 2001 | Product Number: A15822 | Price: $136.00

API/EI Spec 1584
Four-inch Aviation Hydrant System Components and Arrangements

Provides recommended minimum performance and mechanical specifications for the design of aviation fuel hydrant system pit valves and associated couplers. The specification also includes requirements that need to be met to achieve full interchangeability between components of various manufacturers and requirements for optional features which component manufacturers may be requested by users to provide. Pages: 39

3rd Edition | April 2001 | Reaffirmed: September 1, 2007
Product Number: A15843 | Price: $174.00

API/EI Publ 1585
Guidance in the Cleaning of Aviation Fuel Hydrant Systems at Airports

Intended to assist all those responsible for designing, constructing, commissioning, operating and maintaining aviation fuel hydrant systems. Provides guidance in the cleaning of existing fuel hydrant systems that are showing signs of having become contaminated with water, particulate material and/or microbiological activity. The publication provides guidance which, if followed, will help in ensuring that the construction and commissioning of a system does not cause subsequent adverse effects on fuel quality. In addition, it contains operational guidelines to assist in the maintenance of continued cleanliness. This publication will be of interest to hydrant systems designers, engineering contractors, hydrant operating companies, aviation fuel suppliers, into-plane refuelling companies and airport authorities. Pages: 56

2nd Edition | October 2007 | Product Number: A158502 | Price: $186.00

API/EI Spec 1590
Specifications and Qualification Procedures for Aviation Fuel Microfilters

Describes specifications and qualification test procedures for microfilter elements of the disposable cartridge type and, separately, the manufacturing requirements for new vessels for use in aviation jet fuel-handling systems. Pages: 27

2nd Edition | April 2002 | Reaffirmed: February 15, 2008
Product Number: A15902 | Price: $136.00

API/EI RP 1594
Initial Pressure Strength Testing of Airport Fuel Hydrant Systems with Water

Provides recommended practices for the initial pressure strength testing of nee aviation fuel hydrant systems, using water as the test liquid. It is applicable to new systems or resisting systems where positive isolation can be achieved between the sections. Using water as the test medium, rather than kerosene, is becoming an increasing requirement under local environmental protection legislation. This second edition published jointly with EI, focuses on methods of dewatering and drying after the system has been tested. It will be of interest to designers, engineers and operators of airport fuel hydrant systems. Pages: 20

2nd Edition | December 2007 | Product Number: A15941 | Price: $120.00

API/EI RP 1595
Design, Construction, Operation, Maintenance, and Inspection of Aviation Pre-Airfield Storage Terminals

Contains basic requirements for the design, construction, operation and maintenance of pre-airfield storage terminals located directly upstream of the airport. It also provides guidance on the minimum equipment standards and operating procedures for the receipt and storage of aviation fuels at pre-airfield storage terminals and its shipment directly via a grade-dedicated pipeline, marine vessel (barge or ship) or road/rail transport to an airport. This RP does not address in-transit or break out storage upstream of the pre-airfield storage terminal or product recertification requirements after receipt. Pages: 86

1st Edition | August 2006 | Product Number: A159501 | Price: $174.00

API/EI Spec 1596
Design and Construction of Aviation Fuel Filter Vessels

Contains guidance intended to provide the industry with mechanical specifications for the design and construction of aviation fuel filter vessels for 1581 filter/water separators, 1583 filter monitors and 1590 microfilters. The publication also provides requirements for vessel accessories. Although these vessels are primarily intended for civilian applications, many of the requirements may also be applicable to vessels intended for military use. Further advice should be sought from manufacturers for specific military applications. Pages: 23

1st Edition | December 2006 | Product Number: A159601 | Price: $136.00

API/EI RP 1597
Procedures for Overwing Fuelling to Ensure Delivery of the Correct Fuel Grade to an Aircraft

A guide to procedures and equipment that should be used for the proper installation of underground petroleum storage systems. For use by architects, engineers, tank owners, tank operators, and contractors. Applies to underground storage tank systems that store petroleum products at retail and commercial facilities. Pages: 23

1st Edition | December 2006 | Product Number: A159701 | Price: $136.00

API/EI Std 1598
Considerations for Electronic Sensors to Monitor Free Water and/or Particulate Matter in Aviation Fuel

Provides minimum design and functional requirement for electronic sensors for the detection of particulate matter and/or free water in aviation fuel handling systems. This publication is primarily intended to apply to electronic sensors that can be used on vehicles (hydrant servicers/dispensers, carts and refuelers) in commercial/civilian applications, handling jet fuel or aviation gasoline. It is intended that such sensors would be used in conjunction with filtration equipment. He primarily purpose of the publication is to encourage manufacturers of electronic sensors, that currently used in fluid applications, to consider the suitability of their equipment for use in aviation fuel handling systems. It has been issued as a "Draft Standard" as it is not known whether any electronic sensors exist, or can be manufactured,

that can meet fully all of the requirements. It is also not known what the effects of exposure of such equipment to the commercial aircraft fuelling environment. Pages: 29

1st Edition | July 2007 | Product Number: A159801 | Price: $136.00

API/EI Spec 1599 ◆
Laboratory Tests and Minimum Performance Levels for Aviation Fuel Dirt Defense Filters

This specification includes guidance intended to provide the industry with minimum recommendations for:

- The general mechanical specifications for dirt defense filter elements.
- Selected laboratory tests and minimum performance requirements for the qualification of dirt defense filter element designs.
- Requalification of similarity requirements.

The laboratory tests provide standard methods of evaluating selected aspects of the performance of new dirt defense filter element designs, which may be relevant to field service. They are not intended to predict the actual performance of dirt defense filters in field service. Dirt Filters that meet the requirements of API/EI 1599 may be used in vessels formally used as filter monitors. It is envisaged that dirt defense filter systems will be used in conjunction with a water removal or water detection device that will ensure free water content fuel is acceptable for servicing aircraft. Pages: 37

1st Edition | March 2007 | Product Number: A159901 | Price: $136.00

MARKETING OPERATIONS

RP 1525 ◆
Bulk Oil Testing, Handling, and Storage Guidelines

This recommended practice is designed to be used as a reference and management guide by personnel operating and managing petroleum and tank facilities associated with the storage and distribution of petroleum lubricants. Topics covered include equipment and facility standards, product sampling and testing methods and equipment, receiving and storage of bulk lubricants, and packaging and loading petroleum lubricants for distribution to other facilities. Pages: 28

1st Edition | June 1997 | Product Number: F15251 | Price: $63.00

RP 1604
Closure of Underground Petroleum Storage Tanks

Provides operating procedures that may be used for the abandonment, removal, storage, temporarily-outservice, and sale of used underground tanks that have contained gasoline or other flammable liquids Pages: 9

3rd Edition | March 1996 | Reaffirmed: November 1, 2001
Product Number: A16043 | Price: $73.00

RP 1615
Installation of Underground Petroleum Storage Systems

A guide to procedures and equipment that should be used for the proper installation of underground petroleum storage systems. For use by architects, engineers, tank owners, tank operators, and contractors. Applies to underground storage tank systems that store petroleum products at retail and commercial facilities. Pages: 53

5th Edition | March 1996 | Reaffirmed: November 1, 2001
Product Number: A16155 | Price: $118.00

Publ 1621
Bulk Liquid Stock Control at Retail Outlets

Primarily applied to underground storage of motor fuels and used oil at retail and commercial facilities. Assists the operator in controlling bulk stock losses, thereby achieving a high level of safety and pollution control while maximizing profits. Pages: 25

5th Edition | May 1993 | Reaffirmed: January 1, 2001
Product Number: A16210 | Price: $80.00

RP 1626
Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Service Stations

Provides recommended practices for the storage, handling, and fire protection of both ethanol and gasoline-ethanol blends that have become widely used as a motor fuel component. Although gasoline-ethanol blends have some properties similar to gasoline, there are differences that require the special treatment described in this publication. Pages: 8

1st Edition | April 1985 | Reaffirmed: January 1, 2000
Product Number: A16260 | Price: $57.00

RP 1627
Storage and Handling of Gasoline-Methanol/Cosolvent Blends at Distribution Terminals and Service Stations

Describes recommended practices for the storage, handling, and fire protection of gasoline-methanol/ cosolvent blends. Pages: 6

1st Edition | August 1986 | Reaffirmed: January 1, 2000
Product Number: A16270 | Price: $57.00

RP 1631
Interior Lining and Periodic Inspection of Underground Storage Tanks

Provides minimum recommendations for the interior lining of existing steel and fiberglass reinforced plastic underground tanks used to store petroleum-based motor fuels and middle distillates. Recommendations and procedures to be followed by contractors, mechanics, and engineers are presented. Methods for vapor-freeing tanks, removing sediment, and cleaning interior surfaces of steel and fiberglass tanks are also presented, as are guidelines for identifying tanks that maybe lined. Pages: 25

5th Edition | June 2001 | Product Number: A16315 | Price: $83.00

RP 1632
Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems

Covers two methods of providing cathodic protection for buried steel petroleum storage and dispensing systems. Provides information specific to buried steel structures such as motor fuel storage tanks and delivery piping waste oil tanks, heating-oil tanks, and automobile lifts installed at service stations. (As a companion document, the NACE Publication RP 02-85, Corrosion Control of Underground Storage Tank Systems by Cathodic Protection, may be purchased with RP 1632 as a set only. This document details cathodic protection guidance for engineers and technicians.) Pages: 18

3rd Edition | January 1996 | Reaffirmed: June 1, 2002
Product Number: A16323 | For RP 1632 only: Price: $63.00
For RP 1632 and NACE RP 02-85 as a set: Price $94.00

RP 1637
Using the API Color-Symbol System To Mark Equipment and Vehicles For Product Identification at Service Stations and Distribution Terminals

Describes a system for marking equipment used to store and handle bulk petroleum, alcohol-blended petroleum and biodiesel products. The marking system described in this recommended practice does not cover aviation fuels. Marking systems for aviation fuels are described in API/IP Standard 1542, *Identification Markings for Dedicated Aviation Fuel Manufacturing and Distribution Facilities, Airport Storage and Mobile Fuelling Equipment*. Pages: 15

3rd Edition | July 2006 | Product Number: A16373 | Price: $64.00

Publ 1639
Owner/Operator's Guide to Operation and Maintenance of Vapor Recovery Systems at Gasoline Dispensing Facilities

Provides guidance for owners and operators of gasoline dispensing facilities and regulatory officials regarding the operation and maintenance of gasoline vapor recovery systems and components. Proper operation and maintenance of the equipment can improve compliance with vapor recovery regulations and provide substantial emission reductions. This guide does not address the maintenance required by qualified service technicians. Pages: 22

1st Edition | July 2003 | Product Number: A16391 | Price: $83.00

Publ 1642
Alcohol, Ethers, and Gasoline-Alcohol and Gasoline-Ether Blends

Examines fire safety considerations at petroleum marketing facilities. Focuses on gasoline blended with oxygenates, and M85, but also includes alcohols and ethers because they may be present at terminals and bulk plants for blending purposes. Pages: 12

1st Edition | February 1996 | Product Number: A16421 | Price: $58.00

Publ 1645
Stage II Cost Study

This publication is a study that was conceived and scoped to address the general installation cost information for three different types of retail gasoline outlet (RGO) vapor recovery systems: vapor balance, passive vacuum assist, and active vacuum assist. Additionally, it provides an overview of how each system operates. Pages: 6

1st Edition | August 2002 | Product Number: A16451 | Price: $55.00

RP 1650
Set of Six API Recommended Practices on Underground Petroleum Storage Tank Management

A complete set of API Recommended Practices 1604 (removal), 1615 (installation), 1621 (stock control), 1628 (spill clean-up), 1631 (interior lining), and 1632 (cathodic protection) in a vinyl binder. See description of individual recommended The 6 RPs are referenced as appropriate standards and guidance documents in recently-mandated federal technical standards for underground storage systems. The latest edition of each of the six standards will be included in the package.

1st Edition | Product Number: A16502 | Price: $287.00

Std 2610
Design, Construction, Operation, Maintenance & Inspection of Terminal and Tank Facilities
(ANSI/API 2610-2005)

Covers the design, construction, operation, inspection, and maintenance of petroleum terminal and tank facilities associated with marketing, refining, pipeline, and other similar activities. Covers site selection and spacing, pollution prevention and waste management, safe operations, fire prevention and protection, tanks, dikes and berms, mechanical systems (pipe, valves, pumps and piping systems), product transfer, corrosion protection, structures, utilities and yard, and removals and decommissioning. Pages: 53

2nd Edition | May 2005 | Product Number: C26102 | Price: $118.00

USED OIL

A Guidebook for Implementing Curbside and Drop-Off Used Motor Oil Collection Programs

Designed to help municipal managers and regulators evaluate the types of available programs (either curbside or drop-off programs, including examples of both), and how to effectively implement these used oil recycling programs. It is based on national surveys of existing programs throughout the country and includes examples of budgets, procedures, equipment, and model programs that are currently underway. Pages: 47

1st Edition | February 1992 | Product Number: B20002 | Price: Free*

National Used Oil Collection Study

Reviews the status of used engine oil collection in the United States. Documents state efforts to collect oil and the outcomes of such efforts. Provides examples of how used oil collection can be successful, as well as warning of the pitfalls that should be avoided, based on the experience of other states. Pages: 248

1st Edition | June 1996 | Product Number: B18301 | Price: $57.00

Publ 1835 ◆
Study of Used Oil Recycling in Eleven Selected Countries

The study described in this report obtained information about used motor oil collection and recycling programs in 11 selected countries around the world. Pages: 55

1st Edition | November 1997 | Product Number: B183501 | Price: $57.00

TANK TRUCK OPERATIONS

For Safety's Sake-MC 306 Cargo Tank Vehicle Inspection

This VHS tape provides a step-by-step approach to pre-and post-trip inspection of MC 306 cargo tank vehicles. The tape follows a driver through an actual walk-around inspection and covers driver record keeping and the inspection itself-brakes, lights, mirrors, tires, wiring, the tank, and placards. Also includes common truck defects. The videotape was prepared under the direction of the API Highway Safety Committee and parallels the U.S. Department of Transportation's truck inspection regulations. Two minutes of blank leader is provided on the tape so that it can be customized to fit company training needs. VHS tape 14 minutes. Pages: 65

January 1989 | Product Number: A11500 | Price: $100.00

RP 1004
Bottom Loading & Vapor Recovery for MC-306 Tank Motor Vehicles

Provides an industry standard for bottom loading and vapor recovery of proprietary and hired carrier DOT MC306 tank vehicles at terminals operated by more than one supplier. Guides the manufacturer and operator of a tank vehicle as to the uniform features that should be provided to permit loading of a tank vehicle with a standard 4-inch adapter. This edition of RP 1004 requires an independent secondary control system and maximum requirements for outage in the tank to allow the secondary control system to function. Pages: 21

8th Edition | January 2003 | Product Number: D10048 | Price: $107.00

RP 1007
Loading and Unloading of MC 306/DOT 406 Cargo Tank Motor Vehicles

Ensuring the safe and efficient loading and delivery of petroleum products to retail service stations and bulk facilities is the primary goal for all companies that transport product. This document is a guideline for use by the truck driver and persons responsible for loading and unloading of MC306/DOT406 cargo tanks. It identifies specific steps to ensure that product can be loaded into tank trucks and unloaded into both underground and aboveground storage tanks in a safe and efficient manner that protects the environment. It is intended to be used in conjunction with existing driver training programs and procedures. Pages: 24

1st Edition | April 2001 | Product Number: A10071 | Price: $37.00

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RP 1112
Developing a Highway Emergency Response Plan for Incidents Involving Hazardous Materials

Provides minimum guidelines for developing an emergency response plan for incidents involving hazardous liquid hydrocarbons such as gasoline and crude oil, transported in MC 306/DOT 406 and MC 307/DOT 407 aluminum cargo tanks, and for coordinating and cooperating with local, state, and federal officials. Covers response plan priorities, personnel training, special equipment, media relations, environmental relations, and post-response activities. The appendixes outline a highway emergency response plan and suggest a procedure for removing liquid hydrocarbons from overturned cargo tanks and righting the tank vehicles. Pages: 21

3rd Edition | November 1997 | Reaffirmed: August 1, 2002
Product Number: A11123 | Price: $73.00

Publ 1659
Keeping it Clean: Making Safe and Spill-Free Motor Fuel Deliveries

See Also Marketing, video Tape and Training Programs. Provides information on the procedures and pollution-control equipment associated with motor fuel deliveries by tank trucks to retail marketing facilities (such as service stations) that are equipped with Stage I vapor recovery pollution control equipment. This 25-minute videotape describes three types of Stage I vapor recovery equipment that petroleum tank truck drivers may encounter during deliveries: coaxial, twopoint, and manifolded. Also describes other pollution control techniques used, such as overfill protection, spill containment, and monitoring well identification. Produced by the Environmental Media Center (EMC) for the U.S. Environmental Protection Agency in cooperation with API, the Petroleum Equipment Institute (PEI), the Petroleum Marketers Association of America (PMAA), the Fiberglass Petroleum Tank and Pipe Institute, and the Steel Tank Institute. EMC, PEI, and PMAA are also distributing this video. 25 minutes, VHS format only.

1st Edition | December 1992 | Product Number: A16590 | Price: $94.00

MOTOR OILS AND LUBRICANTS

Motor Oil Shelf Cards

This two page laminated guide to help consumers understand the API Engine Oil Quality Marks—the API certification Mark "Starburst" and Service Symbol "Donut"—and the API Service Categories.

Self Cards are available in English and Spanish and can be personalized with a Company Logo. For information on personalizing the shelf cards, call 202-682-8156.

Single copies free on request from API [eolcs@api.org or (202)-682-8516]
Packs of 50 for $126.00

Publ 1509
Engine Oil Licensing and Certification System

Describes the voluntary API Engine Oil Licensing and Certification System (EOLCS) and explains to marketers how different API marks are licensed and displayed for the consumer. The publication describes methods for developing new engine oil performance requirements and provides the marketer with a description of the API marks and their use, licensing requirements, aftermarket conformance, and enforcement procedures. EOLCS is the result of cooperation between the U.S. automobile manufacturers represented by the American Automobile Manufacturers Association (AAMA) and the U.S. petroleum industry represented by API. This program will benefit consumers, the petroleum industry and automobile manufacturers. Pages: 72

15th Edition | April 2002 | Product Number: F150915 | Price: $127.00

Publ 1520 ◆
Directory of Licensees: API Engine Oil Licensing and Certification System

Identifies the companies licensed to display the API Engine Oil Licensing and Certification System (EOLCS) Symbols.

This directory can only be accessed through API's webpage, www.api.org

DIESEL FUEL

Publ 1571
Diesel Fuel—Questions and Answers for Highway and Off-Highway Use

Provides answers to some of the frequent questions asked about diesel fuel. Included are explanations of the quality features of diesel fuel and their significance; descriptions of diesel fuel classifications; discussions of additives normally used and their purposes; and explanations of factors that can affect performance. Pages: 20

4th Edition | January 1996 | Product Number: F15714
Price: Pack of 25 for $70.00

HEALTH, ENVIRONMENT AND SAFETY: WASTE

Publ 1638
Waste Management Practices for Petroleum Marketing Facilities

Provides specific guidance for managing typical waste streams at petroleum marketing facilities. This publication covers petroleum marketing facilities ranging from retail fuel convenience stores to terminals and lube plants. Pages: 20

1st Edition | October 1994 | Product Number: A16381 | Price: $73.00

HEALTH, ENVIRONMENT AND SAFETY: WATER

Publ 1612
Guidance Document for Discharging of Petroleum Distribution Terminal Effluents to Publicly Owned Treatment Works

Provides terminal managers with guidance on discharging terminal effluents to publicly owned treatment works (POTWs). Covers relations with POTW personnel. POTW concerns in accepting terminals wastewater, pretreatment regulations and local limits on the discharge of wastewaters to POTWs, and associated costs. Pages: 34

1st Edition | November 1996 | Product Number: A16121 | Price: $94.00

Publ 1669
Results of a Retail Gasoline Outlet and Commercial Parking Lot Storm Water Runoff Study

Presents the findings of a study to characterize storm water runoff from retail gasoline outlets and compares the results with runoff from commercial parking lots and published urban "background" values. Funded by the Western States Petroleum Association (WSPA) and the American Petroleum Institute (API), the results of this study indicate that fueling activities at normally operated and maintained retail gasoline outlets do not contribute additional significant concentrations of measured constituents in storm water runoff. Pages: 24

1st Edition | December 1994 | Product Number: A16691 | Price: $80.00

HEALTH, ENVIRONMENT AND SAFETY: SOIL AND GROUNDWATER

Publ 1628
A Guide to the Assessment and Remediation of Underground Petroleum Releases

Provides an overview of proven technologies for the assessment and remediation of petroleum releases in soil and groundwater. Covers accidental releases arising from the production, transportation, refining, and marketing of liquid petroleum products or unrefined crude oil. Pages: 119

3rd Edition | July 1996 | Product Number: A16283 | Price: $159.00

API Publication 1628 and Its five companion publications (1628 A, B, C, D, and E) may be purchased as a set.
Order Number: A1628S | Price: $313.00

Publ 1628A
Natural Attenuation Processes

Describes the physical, chemical, and biological processes that decrease the concentrations and ultimately limit the extent of the dissolved plume migrating from a hydrocarbon release. Pages: 16

1st Edition | July 1996 | Product Number: A1628A | Price: $57.00

Publ 1628B
Risk-Based Decision Making

Discusses risk-based decision making approaches used for the assessment of hazardous conditions. Also presents information that can be utilized to focus remedial measures and funds on petroleum hydrocarbon release sites while being protective of human health and the environment, and to facilitate timely closure of hydrocarbon-impacted sites. Pages: 13

1st Edition | July 1996 | Product Number: A1628B | Price: $57.00

Publ 1628C
Optimization of Hydrocarbon Recovery

Covers the optimization, in its broadest sense, to achieve an environmentally sound site closure in the appropriate time frame for the least cost (to maximize efficiency of the selected system). Pages: 20

1st Edition | July 1996 | Product Number: A1628C | Price: $57.00

Publ 1628D
In-Situ Air Sparging

Covers in-situ air sparging. Covers remediation technologies starting with the early techniques of containment or mass reduction through today's very aggressive site closure techniques. Addresses containment as well as residual petroleum hydrocarbon compounds. Pages: 13

1st Edition | July 1996 | Product Number: A1628D | Price: $57.00

Publ 1628E
Operation and Maintenance Considerations for Hydrocarbon Remediation Systems

Discusses concepts regarding operation and maintenance procedures necessary to achieve and maintain optimal performance of petroleum hydrocarbon remediation systems.

1st Edition | July 1996 | Product Number: A1628E | Price: $57.00

Publ 1629
Guide for Assessing and Remediating Petroleum Hydrocarbons in Soils

Provides information regarding the site and release characteristics relevant to and methods for assessing and remediating soils contaminated with petroleum hydrocarbons released from underground storage tank or aboveground storage tank systems and operations. Developed to complement Publ 1628, which focuses primarily on assessing and remediating petroleum releases that may impact groundwater. Pages: 81

1st Edition | October 1993 | Product Number: A16290 | Price: $145.00

Publ 4655
Field Evaluation of Biological and Non-Biological Treatment Technologies to Remove MTBE/Oxygenates From Petroleum Product Terminal Wastewaters

A pilot/demonstration study was conducted on three treatment technologies--the fluidized bed biological reactor process, the activated sludge process incorporated with iron flocculation, and the ultraviolet light/hydrogen peroxide process--to evaluate their effectiveness in the treatment of petroleum marketing terminal wastewater contaminated with methyl tert-butyl ether (MTBE). Contaminated groundwater was the primary constituent of the wastewater, which also contained benzene, toluene, xylenes, and ethylbenzene (BTEX). All three technologies were able to remove at least 95% of the MTBE and BTEX in the feed waters. Pages: 194

August 1997 | Product Number: I46550 | Price: $119.00

Publ 4741
Collecting and Interpreting Soil Gas Samples from Vadose Zone-A Practical Strategy for Assessing the Subsurface Vapor-to-Indoor Air Migration Pathway at Petroleum Hydrocarbon Sites

Focuses on the collection of soil gas samples for assessing the significance of the subsurface-vapor-to-indoor-air exposure pathway. While soil gas collection is not the only means of assessing this pathway, soil gas data play a prominent role in recent guidance published by the American Petroleum Institute (API 1998) and the United States Environmental Protection Agency (USEPA 2002a). For example, these data can be used to help make decisions concerning:

- Resource Conservation and Recovery Act (RCRA) corrective action environmental indicators (EI) for human health exposures.
- Current exposure scenarios in existing buildings
- Future exposure scenarios in existing buildings.
- Future exposure scenarios in future buildings. Pages: 104

October 2005 | Product Number: I47410 | Price: $158.00

Publ 4760
LNAPL Distribution and Recovery Model (LDRM)

The API LNAPL Distribution and Recovery Model (LDRM) simulate the performance proven hydraulic technologies for recovering free-product petroleum liquid releases to groundwater. The LDRM provides information about LNAPL distribution in porous media and allows the user to estimate LNAPL recovery rates, volumes and times. Documentation for the LDRM is provided in 2 volumes. Volume 1—Distribution for the LDRM is porous media documents the LDRM and provides background information necessary to characterize the behavior of LNAPL in porous media with regard to performance of LNAPL liquid recovery technologies. Volume 2—User and Parameter Selection Guide provides step-by-step instructions for LDRM software. Four example problem applications are presented witch highlight model use, parameter estimation using the API LNAPL Parameters database, and limitations of scenario-based models

January 2007 | Software and documentation can be downloaded from API's web site: goundwater.api.org/lnapl

API sponsored research yields practical tools and basic science for risk-based, cost effective solutions to soil and groundwater. Certain publications and summaries of API groundwater research are made available free on our website.
Recent additions to the web site include the following:

Publ 4699
Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE

Applies the principles of risk-informed decision making to the evaluation of MTBE-affected sites by adding exposure and risk considerations to the traditional components of the corrective action process. The risk factors at a given site are evaluated through a "Conceptual Site Model," which is an inventory of all known or potential oxygenate sources, pathways, and receptors. Based on these risk factors, three levels of assessment are defined: standard, limited, and detailed. The appropriate level of assessment is initially determined based on receptor data, which can typically be obtained from a survey of nearby wells and land uses. A subsurface investigation may then be conducted to obtain information on sources and pathways. The level of assessment can be "upgraded" or "downgraded" as warranted by the resulting source and pathway information. Includes a review of the chemical properties and subsurface behavior of MTBE and other oxygenated fuel additives. It also provides an overview of characterization monitoring issues at oxygenate release sites, as well as a detailed review of the tools and techniques used for subsurface assessment. The expedited site assessment process and the use of modern direct-push tools are particularly emphasized, since these approaches are especially well suited for use at MTBE-affected sites.

June 2000

API Soil and Groundwater Research Bulletins

API Soil and Groundwater Research Bulletins summarize research results from project overseen by API's Soil and Groundwater Technical Task Force. The Task Force disseminates information and research results through publications, presentations and interaction with industry clients and regulatory agencies.

The bulletins listed below can be downloaded from www.api.org/bulletins.

Bulletin No. 24
Downward Solute Plume Migration: Assessment Significance and Implications for Characterization and Monitoring of "Diving Plumes"

April 2006

Bulletin No. 23
The Impact of Gasohol and Fuel-grade Ethanol on TTX and Other Hydrocarbons in Ground Water: Effect on Concentrations Near a Source

December 2005

Bulletin No. 22
Maximum Potential Impacts of Tertiary Butyl Alcohol (TBA) on Groundwater from Small-volume Releases of Ethanol-blended Gasoline in the Vadose Zone

December 2004

Bulletin No. 21
Evaluation of Potential Vapor Transport to Indoor Air Associated with Small-volume Releases of Oxygenated Gasoline in the Vadose Zone

December 2004

Bulletin No. 20
Answers to Frequently Asked Questions About Ethanol Impacts to Groundwater

December 2003

Bulletin No. 19
Evaluation of Small-volume Releases of Ethanol-blended Gasoline at UST Sites

October 2003

Bulletin No. 18
Answers to Frequently Asked Questions About Managing Risk at LNAPL Sites

May 2003

Bulletin No. 17
Identification of Critical Parameters for the Johnson and Ettinger (1991) Vapor Intrusion Model

May 2002

Bulletin No. 16
Migration of Soil Gas Vapors to Indoor Air: Determining Vapor Attenuation Factors Using a Screening-level Model and Field Data from the CDOT-MTL

April 2002

Bulletin No. 15
Vadose Zone Natural Attenuation of Hydrocarbon Vapors An Empirical Assessment of Soil Gas Vertical Profile Data

December 2001

Bulletin No. 14
Predicting the Effect of Hydrocarbon and Hydrocarbon-impacted Soil on Groundwater

September 2001

Bulletin No. 13
Dissolution of MTBE from a Residually-trapped Gasoline Source

September 2001

Bulletin No. 12
No-Purge Sampling: An Approach for Long-term Monitoring

October 2000

Bulletin No. 11
Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE

August 2000

Bulletin No. 10
Simulation of Transport of Methyl Tert-butyl Ether (MTBE) to Groundwater from Small-volume Releases of Gasoline in the Valdose Zone

June 2000

Bulletin No. 9
Non-aqueous Phase Liquid (NAPL) Mobility Limits in Soil

June 2000

Bulletin No. 8
Characteristics of Dissolved Petroleum Hydrocarbon Plumes Results from Four Studies

December 1998

Bulletin No. 5
Evaluation of Sampling and Analytical Methods for Measuring Indicators of Intrinsic Bioremediation

February 1998

Bulletin No. 3
Ten Frequently Asked Questions about MTBE in Water

March 1998

Bulletin No. 1
Summary of Processes, Human Exposures and Remediation Technologies Applicable to Low Permeability Soils

September 1996

SECURITY

API Standard for Third Party Network Connectivity

Provides guidance for implementing secure third-party connections between the information technology systems and network of two companies that have a business relations and a common objective.

The standard will provide suggestions for companies to establish third-party network connections while protecting their individual systems and data from unauthorized access or manipulation. Pages: 36

October 2007 | Product Number: TSTP01 | Price: $87.00

Security Guidance for the Petroleum Industry

API's 2nd Edition of *Security Guidance for the Petroleum Industry*, is now in use at oil and gas facilities around the world to help managers decide how to deter terrorist attacks. Covering all segments of the industry (production, refining, transportation, pipeline, and marketing), this guidance builds on the existing solid foundation of design and operational regulations, standards, and recommended practices, which relate to facility design and safety, environmental protection, emergency response, and protection from theft and vandalism. Produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies, these guidelines, viewed as a living document, are broadly applicable to facility security in light of September 11, 2001, and provide the starting point for developing security plans at oil and natural gas facilities and operations. Pages: 169

2nd Edition | March 2003 | Product Number: OS0001 | Price: $185.00

Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

The American Petroleum Institute and the National Petrochemical & Refiners Association jointly developed a new methodology for evaluating the likelihood and consequences of terrorist attacks against refineries and petrochemical facilities. *Security Vulnerability Assessment Methodology for Petroleum and Petrochemical Facilities* is designed for companies to use in assessing vulnerabilities and potential damages from different kinds of terrorist attacks. In the post September 11 era, companies have reevaluated and enhanced security at their facilities. The methodology will provide officials with a new analytical tool to determine "the likelihood of an adversary successfully exploiting vulnerability and the resulting degree of damage or impact." This vulnerability assessment methodology was produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies. Pages: 155

October 2004 | Product Number: OSVA02 | Price: $185.00

Std 1164 ■
Pipeline SCADA Security

Provides guidance to the operators of oil and gas liquids pipeline systems for managing SCADA system integrity and security. The use of this document is not limited to pipelines regulated under Title 49 *CFR* 195.1, but should be viewed as a listing of best practices to be employed when reviewing and developing standards for a SCADA system. This document embodies the API's Security Guidelines for the Petroleum Industry. This guideline is specifically designed to provide the operators with a description of industry practices in SCADA security, and to provide the framework needed to develop sound security practices within the operator's individual companies. It is important that operators understand system vulnerability and risks when reviewing the SCADA system for possible system improvements.

The goal of an operator is to control the pipeline in such a way that there are no adverse effects on employees, the environment, the public, or the customers as a result of actions by the operator, or by other parties. This document is structured so that the main body provides the high-level view of holistic security practices. The annexes provide further details and technical guidance. Reviewing the main body of this document and following the guidance set forth in the annexes assists in creating inherently secure operations.

Implementation of this standard, to advance supervisory control and data acquisition (SCADA) cyber security, is not a simple process or one time event, but a continuous process. The overall process could take years to implement correctly depending on the complexity of the SCADA system. Additionally the process would optimally be started as part of a SCADA upgrade project and use this standard to "design in" security as a element of the new system. Pages: 64

2nd Edition | June 2009 | Product Number: D11642 | Price: $141.00

SECURITY—TRAINING COURSES

Workshop on Industry Security Vulnerability Assessments (SVAs)
www.api-u.org/SVA.html

API presents the leading SVA training for the petroleum, petrochemical and chemical industries. The objective of an SVA is to identify security hazards, threats and vulnerabilities facing a facility and to evaluate the countermeasures to provide for the protection of the public, workers, national interests, the environment, and the company.

Workshop on USCG Regulations for Facility Security Officers (FSOs)
www.api-u.org/FSO.html

Learn about the requirements for Facility Security Officers released in the U.S. Coast Guard (USCG) Final Rule: Part 105, Subpart B. Course materials include a reference CD of over 30 helpful related documents including the regulation, NVICs, API's "Security Vulnerability Assessment for the Petroleum & Petrochemical Industries", and numerous DHS bulletins.

If you have any questions or comments regarding API standards, please visit www.api.org/standards.

NOTE: Free publications with an asterisk are subject to a $10.00 handling charge for each total order, plus actual shipping charges.

PIPELINE PUBLIC EDUCATION AND AWARENESS

Get the Dirt

Video A damage prevention awareness video produced by the Dig Safely team. The video explains the call first process and encourages its use. Available in both English and Spanish.

Single copies free from the API Pipeline Segment: (202) 682-8125
Multiple copies available for $1.30 each plus shipping from Revak & Associates: (330) 533-1727

Guidelines for Property Development ■
(Brochure)

The liquid petroleum pipeline industry has developed these guidelines to improve understanding and increase awareness of the nature of underground pipelines that transport oil, petroleum products, natural gas liquids and other hazardous liquids and how to conduct land development and use activity near pipeline rights-of-way.

The guidelines are intended for use by anyone who is involved in land development, agriculture and excavation/construction activities near a pipeline. The industry's goal is to protect public safety of the people who live and work along pipeline rights-of-way, protect the environment along rights-of-way, and maintain the integrity of the pipeline so that petroleum products can be delivered to customers safely and without interruption.

A pipeline right-of-way (ROW) is property in which a pipeline company and a landowner both have a legal interest. Each has a right to be there, although each has a different type of use for the land. Pipeline companies are granted permission from private landowners to transport petroleum products across their private lands. That permission is documented in a written agreement called an easement, and it is obtained though purchase, license, or by agreement with the landowner. In cases where the land is owned by the government—whether local, state or federal—similar arrangements for easements, licenses or occupancy agreements are obtained.

A pipeline requires regular observation, integrity assessment and maintenance to maintain the safety of its operations. Part of that task is to ensure that the pipeline ROW is kept clear of trees, structures and other encroachments that might interfere with the safe operation of the pipeline and the pipeline company's access to the line.

The pipeline industry hopes that these guidelines will help both pipeline operators and people working and living along pipeline rights-of-way to better understand their respective responsibilities for maintaining the safety of this vital, but invisible, transportation system.

November 2009 | Product Number: D0GP04
Price: $65.00 for a packet of 5 | $250.00 for a customized PDF
(for more information on the customized PDF, contact API at publications@api.org)

PIPELINE OPERATIONS PUBLICATIONS

RP 80
Guidelines for the Definition of Onshore Gas Gathering Lines

Developed by an industry coalition that included representatives from over 20 petroleum industry associations, provides a functional description of onshore gas gathering pipelines for the sole purpose of providing users with a practical guide for determining the application of the definition of gas gathering in the federal Gas Pipeline Safety Standards, 49 CFR Part 192, and state programs implementing these standards. Pages: 53

1st Edition | April 2000 | Reaffirmed: March 1, 2007
Product Number: G80001 | Price: $121.00

RP 1102
Steel Pipelines Crossing Railroads and Highways
(includes Errata dated November 2008)

Gives primary emphasis to provisions for public safety. It covers the design, installation, inspection, and testing required to ensure safe crossings of steel pipelines under railroads and highways. The provisions apply to the design and construction of welded steel pipelines under railroads and highways. The provisions of this practice are formulated to protect the facility crossed by the pipeline, as well as to provide adequate design for safe installation and operation of the pipeline. The provisions herein should be applicable to the construction of pipelines crossing under railroads and highways and to the adjustment of existing pipelines crossed by railroad or highway construction. This practice should not be applied retroactively. Neither should it apply to pipelines under contract for construction on or prior to the effective date of this edition. Neither should it be applied to directionally drilled crossings or to pipelines installed in utility tunnels. Pages: 39

7th Edition | December 2007 | Product Number: D11021 | Price: $112.00

Std 1104
Welding of Pipelines and Related Facilities
(includes Errata/Addendum dated July 2007 and Errata 2 dated December 2008)

Covers the gas and arc welding of butt, fillet, and socket welds in carbon and low-alloy steel piping used in the compression, pumping, and transmission of crude petroleum, petroleum products, fuel gases, carbon dioxide, nitrogen and, where applicable, covers welding on distribution systems. It applies to both new construction and in-service welding. The welding may be done by a shielded metal-arc welding, submerged arc welding, gas tungsten-arc welding, gas metal-arc welding, flux-cored arc welding, plasma arc welding, oxyacetylene welding, or flash butt welding process or by a combination of these processes using a manual, semiautomatic, mechanized, or automatic welding technique or a combination of these techniques. The welds may be produced by position or roll welding or by a combination of position and roll welding.

Also covers the procedures for radiographic, magnetic particle, liquid penetrant, and ultrasonic testing, as well as the acceptance standards to be applied to production welds tested to destruction or inspected by radiographic, magnetic particle, liquid penetrant, ultrasonic, and visual testing methods.

It is intended that all work performed in accordance with this standard shall meet or exceed the requirements of this standard. Pages: 70

20th Edition | October 2005 | Product Number: D110420 | Price: $286.00

RP 1109
Marking Liquid Petroleum Pipeline Facilities

Addresses the permanent marking of liquid petroleum pipeline transportation facilities. It covers the design, message, installation, placement, inspection, and maintenance of markers and signs on pipeline facilities located onshore and at inland waterway crossings. Markers and signs indicate the presence of a pipeline facility and warn of the potential hazards associated with its presence and operation. The markers and signs may contain information to be used by the public when reporting emergencies and seeking assistance in determining the precise location of a buried pipeline.

The provisions of this RP cover the minimum marker and sign requirements for liquid petroleum pipeline facilities. Alternative markers, which are recommended for some locations under certain circumstances, are also discussed. The pipeline operator is responsible for determining the extent of pipeline marking. Consideration should be given to the consequences of pipeline failure or damage; hazardous characteristics of the commodity being transported; and the pipeline's proximity to industrial, commercial, residential, and environmentally sensitive areas. The pipeline marking programs are also integral parts of the pipeline operator's maintenance and emergency plans.

This RP is not intended to be applied retroactively. Its recommendations are for new construction and for normal marker maintenance programs subsequent to the effective date of this edition. Pages: 12

3rd Edition | July 2003 | Product Number: D11093 | Price: $86.00

RP 1110
Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids or Carbon Dioxide

Provides guidelines for pressure testing steel pipelines for the transportation of gas, petroleum gas, hazardous liquids, highly volatile liquids or carbon dioxide. The document provides guidance so that:

- Pipeline Operators can select a pressure tests suitable for the conditions under which the test will be conducted. This includes, but is not limited to, pipeline material characteristics, pipeline operating conditions and various types of anomalies or other risk factors that may be present.
- Pressure tests are planned in order to meet overall objectives of the pressure test.
- Site-specific procedures are developed and followed and followed during all phases of the pressure testing process.
- Pressure tests consider both personal safety and environmental impacts.
- Pressure tests are implemented by qualified personnel.
- Pressure tests are conducted in order to meet stated acceptance criteria and pressure test objectives.
- Pressure test records are developed, completed and retained for useful life of facility.

Users of this document should be aware that further or differing requirements may be necessary for some applications. No information contained herein is intended to inhibit the use of engineering solutions that are not covered by the document. This may be particularly applicable where there is innovative developing technology. Where an alternative is offered, the document may be used, provided any and all variations from the recommended practice are identified and documented. Pages: 18

5th Edition | June 2007 | Product Number: D11105 | Price: $93.00

RP 1111 ■
Recommended Practice for the Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines (Limited State Design)

This document sets criteria for the design, construction, testing, operation, and maintenance of offshore steel pipelines used in the production, production support, or transportation of hydrocarbons from the outlet flange of a production facility.

The criteria applies to transportation piping facilities located on production platforms after separation and treatment, including meter facilities, gas compression facilities, liquid pumps, and associated piping and appurtenances. This document may also be used for water injection pipelines offshore.

Limit state design has been incorporated into the document to provide a uniform factor of safety with respect to rupture or burst failure as the primary design condition independent of the pipe diameter, wall thickness, and grade.

The criteria contained in this document are intended to permit the economical transportation of hydrocarbons while providing for the safety of life and property and the protection of the environment. The general adoption of these criteria should assure that offshore hydrocarbon pipelines possess the requisite structural integrity for their safe and efficient operation. Pages: 68

4th Edition | December 2009 | Product Number: D11114 | Price: $129.00

RP 1113
Developing a Pipeline Supervisory Control Center
(Supersedes the 3rd Editon of Publ 1113)

Focuses on the design aspects that may be considered appropriate for developing or revamping a control center. A pipeline supervisory control center is a facility where the function of centralized monitoring and controlling of a pipeline system occurs. This document is not all-inclusive. It is intended to cover best practices and provide guidelines for developing a control center only. It does not dictate operational control philosophy or overall SCADA system functionality. This document is intended to apply to control centers for liquids pipelines; however, many of the considerations may also apply to gas control center design. Pages: 10

1st Edition | August 2007 | Product Number: D11131 | Price: $82.00

RP 1114
Design of Solution-Mined Underground Storage Facilities
(includes Errata dated July 2007)

Provides basic guidance on the design and development of new solution-mined underground storage facilities. It is based on the accumulated knowledge and experience of geologists, engineers, and other personnel in the petroleum industry. Users of this guide are reminded that no publication of this type can be complete nor can any written document be substituted for qualified, site-specific engineering analysis.

All aspects of solution-mined underground storage are covered, including selecting an appropriate site, physically developing the cavern, and testing and commissioning the cavern. Additionally, a section on plug and abandonment practices is included.

Does not apply to caverns used for waste disposal purposes. See API RP 1115 for guidance in the operation of solution-mined underground storage facilities. Pages: 30

1st Edition | June 1994 | Reaffirmed: June 1, 2007
Product Number: D11141 | Price: $83.00

RP 1115
Operation of Solution-Mined Underground Storage Facilities

Provides basic guidance on the operation of solution-mined underground hydrocarbon liquid or liquefied petroleum gas storage facilities. This document is intended for first-time cavern engineers or supervisors, but would also be valuable to those people experienced in cavern operations. This recommended practice is based on the accumulated knowledge and experience of geologists, engineers, and other personnel in the petroleum industry. All aspects of solution-mined underground storage operation, including cavern hydraulics, brine facilities, wellhead and hanging strings, and cavern testing are covered. Users of this guide are reminded that no publication of this type can be complete, nor can any written document be substituted for effective site-specific operating procedures.

Does not apply to caverns used for natural gas storage, waste disposal purposes, caverns which are mechanically mined, depleted petroleum reserve cavities, or other underground storage systems which are not solution-mined. Pages: 16

1st Edition | September 1994 | Reaffirmed: June 1, 2007
Product Number: D11151 | Price: $83.00

RP 1117
Recommended Practice for Movement in In-Service Pipelines
(includes Errata dated December 2008)

Covers the design, execution, inspection, and safety of a pipeline-lowering or other movement operation conducted while the pipeline is in service. (In this document, the terms lowering and movement can be used interchangeably.) This recommended practice presents general guidelines for conducting a pipeline-movement operation without taking the pipeline out of service. It also presents equations for estimating the induced stresses. To promote the

safety of the movement operation, it describes stress limits and procedures. Additionally, it outlines recommendations to protect the pipeline against damage. The practicality and safety of trench types, support systems, and lowering or other methods are considered. Inspection procedures and limitations are presented. Pages: 33

3rd Edition | July 2008 | Product Number: D11173 | Price: $128.00

RP 1130
Computational Pipeline Monitoring for Liquids Pipelines

Focuses on the design, implementation, testing and operation of CPM systems that use an algorithmic approach to detect hydraulic anomalies in pipeline operating parameters. The primary purpose of these systems is to provide tools that assist Pipeline Controllers in detecting commodity releases that are within the sensitivity of the algorithm. It is intended that the CPM system would provide an alarm and display other related data to the Pipeline Controllers to aid in decision-making. The Pipeline Controllers would undertake an immediate investigation, confirm the reason for the alarm and initiate an operational response to the hydraulic anomaly when it represents an irregular operating condition or abnormal operating condition or a commodity release. The purpose of this recommended practice is to assist the Pipeline Operator in identifying issues relevant to the selection, implementation, testing, and operation of a CPM system. Pages: 42

1st Edition | September 2007 | Product Number: D011301 | Price: $108.00

Publ 1132
Effects of Oxygenated Fuels and Reformulated Diesel Fuels on Elastomers and Polymers in Pipeline/Terminal Components

With the passage of the Clean Air Act, pipelines are required to transport reformulated oxygenated products containing ethers and alchohols. In some cases pipelines are shipping neat oxygenates that may have effects on pipeline components. API surveyed the pipeline/terminal industry to determine methods for handling these products, proper selection of materials and product compatibilities.

The objective of this project was to develop a document that consolidates the industry's experience with oxygenated fuels and refomulated diesel fuels and their effects on elastomers and other pipeline and storage components. The scientific objectives of this research were to identify: elastomers or polymers used for different components used in pipelines now and prior to the transport or storage of oxygenated fuels; the cause of failure of components; the problems associated with oxygenated fuels on elastomer and polymer components; changes that have been made in the use of elastomer and polymer components; usefulness of published methodology for evaluating the impact of operating service variables on the service life of elastomer and/or polymer pipeline components; and problems encountered in the pipeline transportation and storage of reformulated diesel fuels. Pages: 36

July 1994 | Product Number: D11321 | Price: $98.00

RP 1133
Guidelines for Onshore Hydrocarbon Pipelines Affecting High Consequence Floodplains

Sets out criteria for the design, construction, operation, maintenance and abandonment of onshore pipelines that could affect high consequence floodplains and associated commercially navigable waterways. This document applies only to steel pipelines that transport gas, hazardous liquids, alcohols or carbon dioxide.

The design, construction, inspection and testing provisions of this document should not apply to pipelines that were designed or installed prior to the latest revision of this publication. The operation and maintenance provisions of this document should apply to existing facilities. The contents in this document should not be considered a fixed rule for application without regard to sound engineering judgment. Pages: 9

1st Edition | February 2005 | Reaffirmed, February 23, 2010
Product Number: D11331 | Price: $79.00

Publ 1149
Pipeline Variable Uncertainties and Their Effects on Leak Detectability

This study quantifies the effects of variables on leak detection using common software-based leak detection methods. This study provides a data base and a step-by-step methodology to evaluate leak detection potential of a given pipeline with specified instrumentation and SCADA capabilities. Incremental improvement of leak detectability resulting from upgrading individual variables can also be determined.

The utility of the results from this study is to enable users (i.e. pipeline companies) to determine the achievable level of leak detection for a specific pipeline with a specified set of instrumentation and SCADA system. The results also help users to understand the sensitivity of leak detectability with respect to the variables involved. This information is useful in several ways: investigating the feasibility of leak detection systems, justifying and prioritizing changes to instrumentation and SCADA systems, configuring pipeline and measurement stations, and aiding leak detection operations.

Three general types of software-based leak detection methods are addressed in this study: (1) mass balance, (2) mass balance with lineful correction, and (3) transient flow analysis. The leak detection potential of these methods are discussed based on hydraulics to the extent possible. The liquids considered are crude oils and refined petroleum products such as gasoline, jet fuel, and fuel oil.

The pipeline configuration considered is a pipe segment with pressure, temperature, and volumetric flow measurements at each end. During steady-state flow, this configuration applies to pipelines with booster pumping stations where rates of flow are measured only at the inlet and the outlet of the entire system. All variables affecting leak detection are listed. General relationships between the variable uncertainties and leak detection potential are analyzed. The methodology are described and verified with field tests. The variables are ranked according to their importance to leak detectability. A step-by-step method and a data base are established to enable simple hand calculations for establishing leak detectability based on mass balance. The method and the data base are verified with field data. The rationale and the procedure to establish leak detectability using mass balance with line pack correction and transient flow simulations are given and illustrated with examples and field trial results. Pages: 118

1st Edition | November 1993 | Product Number: D11491 | Price: $182.00

Publ 1156 & 1156-A
Effects of Smooth and Rock Dents on Liquid Petroleum Pipelines, Phase I and Phase II

This document presents the findings of a project sponsored by the API to determine the effects of smooth dents and rock dents on the integrity of liquid petroleum pipelines to avoid unnecessary repair or replacement of pipelines affected by dents if they do not constitute a threat to pipeline serviceability. The addendum to the report presents a description of work which was done after the completion of Phase I. Additional work has been done to address issues confronted but not resolved in the first phase of the work, and to address new issues raised by the first-phase work.

Publ 1156, Phase I & II: 1st Edition | November 1997 | Price: $356.00
Publ 1156, Phase II only: October 1999 | Price: $147.00

Publ 1157
Hydrostatic Test Water Treatment and Disposal Options for Liquid Pipeline Systems

This report presents the results of a research study to define acceptable and cost effective hydrostatic test water treatment and disposal methods that enable compliance with DOT requirements for testing of liquid pipelines, while meeting regulatory agency permitting requirements for disposal and/or discharge. This study was conducted from February to December 1997 and involved data provided by 15 pipeline companies (representing approximately 45% of the national pipeline system mileage.)

The primary results and conclusions of this study found that activated carbon adsorption was the single most frequently utilized treatment technology for existing pipelines. Activated carbon adsorption appeared to be a viable

option for the smaller projects of 100,000 gallons or less but may have significant limitations for larger projects due to flow volume limitations and logistical considerations for equipment. Alternate water treatment technologies, beyond activated carbon adsorption, hay bales and air stripping, were also evaluated for cost and practicality. These alternatives included dissolved air flotation and ultraviolet light oxidation. Neither of these options proved viable for use in the pipeline industry due to cost, performance or practicality of implementation. Other test water management options that are potentially available to the liquid pipeline industry were also identified.

Inadequate data or cost information was available to evaluate these options but they may be valuable options to consider depending on the specific circumstances of the discharge. Compliance with permit discharge conditions was reported for 84 tests. Of the 329 permit conditions contained in these 84 tests, 327 (99+%) demonstrated compliance.

1st Edition | October 1998 | Product Number: D11571 | Price: $227.00

Publ 1158
Analysis of DOT Reportable Incidents for Hazardous Liquid Pipelines, 1986 through 1996

Presents an analysis of incidents reportable to the U.S. Department of Transportation on approximately 160,000 miles of liquid petroleum pipelines in the U.S. during the eleven-year period from 1986 to 1996.

The analyses presented herein represent work conducted by the U.S. Department of Transportation's, Office of Pipeline Safety and the operators of liquid petroleum pipelines through the American Petroleum Institute to better understand the causes and consequences of incidents, to monitor trends that may indicate the need for action, to use the data to identify potential risks and where risk management would be most productive, and to identify areas for potential improvement in the data collecting process.

This document includes information on general trends of the incidents, trends based on attributes, analysis of incidents by cause, and a data disk containing the incident data for the 11-year period. Pages: 100

1st Edition | January 1999 | Product Number: D11581 | Price: $57.00

Std 1160
Managing System Integrity for Hazardous Liquid Pipelines

Outlines a process that an operator of a pipeline system can use to assess risks and make decisions about risks in operating a hazardous liquid pipeline in order to reduce both the number of incidents and the adverse effects of errors and incidents.

An integrity management program provides a means to improve the safety of pipeline systems and to allocate operator resources effectively to: identify and analyze actual and potential precursor events that can result in pipeline incidents; examine the likelihood and potential severity of pipeline incidents; provide a comprehensive and integrated means for examining and comparing the spectrum of risks and risk reduction activities available; provide a structured, easily communicated means for selecting and implementing risk reduction activities; and, establish and track system performance with the goal of improving that performance.

This standard is intended for use by individuals and teams charged with planning, implementing, and improving a pipeline integrity management program. Typically a team would include engineers, operating personnel, and technicians or specialists with specific experience or expertise (corrosion, in - line inspection, right-of-way patrolling, etc.). Users of this standard should be familiar with the pipeline safety regulations (Title 49 *CFR* Part 195), including the requirements for pipeline operators to have a written pipeline integrity program, and to conduct a baseline assessment and periodic reassessments of pipeline management integrity. Pages: 72

1st Edition | August 2001 | Reaffirmed: November 19, 2008
Product Number: D11601 | Price: $186.00

Publ 1161
Guidance Document for the Qualification of Liquid Pipeline Personnel

Provides guidance to the liquids pipeline industry. The United States Department of Transportation (DOT) requires that pipeline operators develop a written qualification program to evaluate personnel and contractor ability to perform covered tasks and to recognize and respond to abnormal operating conditions that may be encountered while performing these covered tasks. This is a performance-based qualification program. Pages: 96

1st Edition | August 2000 | Product Number: D11611 | Price: $227.00

RP 1162
Public Awareness Programs for Pipeline Operators

Provides guidance to be used by operators of petroleum liquids and natural gas pipelines to develop and actively manage Public Awareness Programs. This document will also help to raise the quality of pipeline operators's Public Awareness Programs, establish consistency among such programs throughout the pipeline industry, and provide mechanisms for continuous improvement of the programs. The recommended practice has been developed specifically for pipelines operating in the United States, but may also have use in international settings.

Identifies for the pipeline operator four specific stakeholder audiences and associated public outreach messages and communication methods to choose from in developing and managing a successful Public Awareness Program. It also provides information to assist operators in establishing specific plans for public awareness that can be evaluated and updated.

Provides guidance for the following pipeline operators: intrastate and interstate hazardous liquid pipelines; intrastate and interstate natural gas transmission pipelines; local distribution systems, and gathering systems. This guidance is intended for use by pipeline operators in developing and implementing Public Awareness Programs associated with the normal operation of existing pipelines.

The guidance is not intended to focus on public awareness activities appropriate for new pipeline construction or for communications that occur immediately after a pipeline related emergency. Communication regarding construction of new pipelines is highly specific to the type of pipeline system, scope of the construction, and the community and state in which the project is located. Likewise, public communications in response to emergency situations are also highly specific to the emergency and location. This RP is also not intended to provide guidance to operators for communications about operator-specific performance measures that are addressed through other means of communication or regulatory reporting. The primary audience for this document is the pipeline operator for use in developing a Public Awareness Program for the following stakeholder audiences: the affected public—i.e. residents, and places of congregation (businesses, schools, etc.) along the pipeline and the associated right-of-way (ROW); local and state emergency response and planning agencies [i.e. State and County Emergency Management Agencies (EMA) and Local Emergency Planning Committees (LEPCs)]; local public officials and governing councils; and, excavators. Pages: 59

1st Edition | December 2003 | Product Number: D11621 | Price: $93.00

Std 1163
In-line Inspection Systems Qualification Standard

Covers the use of in-line inspection systems for onshore and offshore gas and hazardous liquid pipelines. It includes, but is not limited to, tethered or free flowing systems for detecting metal loss, cracks, mechanical damage, pipeline geometries, and pipeline location or mapping, The document applies to both existing and developing technologies. This document is an umbrella document that provides performance-based requirements for in-line inspection systems, including procedures, personnel, equipment, and associated software. Pages: 37

1st Edition | August 2005 | Product Number: D11631 | Price: $118.00

Std 1164 ■
Pipeline SCADA Security

Provides guidance to the operators of oil and gas liquids pipeline systems for managing SCADA system integrity and security. The use of this document is not limited to pipelines regulated under Title 49 *CFR* 195.1, but should be viewed as a listing of best practices to be employed when reviewing and developing standards for a SCADA system. This document embodies the API's Security Guidelines for the Petroleum Industry. This guideline is specifically designed to provide the operators with a description of industry practices in SCADA security, and to provide the framework needed to develop sound security practices within the operator's individual companies. It is important that operators understand system vulnerability and risks when reviewing the SCADA system for possible system improvements.

The goal of an operator is to control the pipeline in such a way that there are no adverse effects on employees, the environment, the public, or the customers as a result of actions by the operator, or by other parties. This document is structured so that the main body provides the high-level view of holistic security practices. The annexes provide further details and technical guidance. Reviewing the main body of this document and following the guidance set forth in the annexes assists in creating inherently secure operations.

Implementation of this standard, to advance supervisory control and data acquisition (SCADA) cyber security, is not a simple process or one time event, but a continuous process. The overall process could take years to implement correctly depending on the complexity of the SCADA system. Additionally the process would optimally be started as part of a SCADA upgrade project and use this standard to "design in" security as a element of the new system. Pages: 64

2nd Edition | June 2009 | Product Number: D11642 | Price: $141.00

RP 1165
Recommended Practice for Pipeline SCADA Displays

Focuses on the design and implementation of displays used for the display, monitoring, and control of information on pipeline Supervisory Control and Data Acquisition Systems (SCADA). The primary purpose is to document industry practices that provide guidance to a pipeline company or operator who want to select a new SCADA system, or update or expand an existing SCADA system. This document assists pipeline companies and SCADA system developers in identifying items that are considered best practices when developing human machine interfaces (HMI). Design elements that are discussed include, but are not limited to, hardware, navigation, colors, fonts, symbols, data entry, and control/selection techniques. Pages: 45

1st Edition | January 2007 | Product Number: D11651 | Price: $147.00

RP 1166
Excavation Monitoring and Observation
(includes Errata dated December 2006)

Provides a consistently applied decision making process for monitoring and observing of excavation and other activities on or near pipeline Rights-of - Way for "hazardous liquid" and "natural and other gas" transmission pipelines. (Note: One call provisions and laws vary by state and it is the operator's responsibility to be familiar with and comply with all applicable one-call laws.). This document's purpose is to protect the public, excavation employees, and the environment by preventing damage to pipeline assets from excavation activities. Pages: 4

1st Edition | November 2005 | Product Number: D11661 | Price: $102.00

RP 1168
Pipeline Control Room Management

Provides pipeline operators and pipeline controllers with guidance on industry best practices on control room management to consider when developing or enhancing practices and procedures. This document was written for operators with continuous and non-continuous operations, as applicable. This document addresses four pipeline safety elements for hazardous liquid and natural gas pipelines in both the transportation and distribution sectors: pipeline control room personnel roles, authorities and responsibilities; guidelines for shift turnover; pipeline control room fatigue management; and, pipeline control room management of change (MOC). Pages: 11

1st Edition | September 2008 | Product Number: D11681 | Price: $80.00

RP 2200
Repairing Crude Oil, Liquefied Petroleum Gas and Product Pipelines

This recommended practice discusses guidelines to safe practices while repairing pipelines for crude oil, liquefied petroleum gas, and product service. Although it is recognized that the conditions of a particular job will necessitate an on-the-job approach, the observance of the suggestions in this document should improve the probability that repairs will be completed without accidents or injuries. Pages: 5

3rd Edition | May 1994 | Reaffirmed: May 1, 1999
Product Number: D22003 | Price: $57.00

PIPELINE MAINTENANCE WELDING

Investigation and Prediction of Cooling Rates During Pipeline Maintenance Welding, and User's Manual for Battelle's Hot-Tap Thermal-Analysis Models

Investigated and improved the methods of predicting cooling rates during pipeline maintenance welding. The scope of this study included (1) a review of three previous research efforts to develop satisfactory methods for welding appurtenances to in-service pipelines; (2) a survey of pipeline leak and rupture incidents associated with appurtenances; (3) the enhancement of existing analytical models for predicting cooling rates and temperatures during welding on an in-service pipeline; and (4) a validation of the thermal-analysis models that was achieved by performing welds on pipeline carrying three different liquid-petroleum products.

May 2002 | Product Number: | Version 4.2 | May 2002
Please order this document from PRCI, www.prci.com

Std 1104
Welding of Pipelines and Related Facilities
(includes Errata/Addendum dated July 2007, and Errata 2 dated December 2008)

Covers the gas and arc welding of butt, fillet, and socket welds in carbon and low-alloy steel piping used in the compression, pumping, and transmission of crude petroleum, petroleum products, fuel gases, carbon dioxide, nitrogen and, where applicable, covers welding on distribution systems. It applies to both new construction and in-service welding. The welding may be done by a shielded metal-arc welding, submerged arc welding, gas tungsten-arc welding, gas metal-arc welding, flux-cored arc welding, plasma arc welding, oxyacetylene welding, or flash butt welding process or by a combination of these processes using a manual, semiautomatic, mechanized, or automatic welding technique or a combination of these techniques. The welds may be produced by position or roll welding or by a combination of position and roll welding.

Covers the procedures for radiographic, magnetic particle, liquid penetrant, and ultrasonic testing, as well as the acceptance standards to be applied to production welds tested to destruction or inspected by radiographic, magnetic particle, liquid penetrant, ultrasonic, and visual testing methods.

It is intended that all work performed in accordance with this standard shall meet or exceed the requirements of this standard. Pages: 70

20th Edition | October 2005 | Product Number: D110420 | Price: $286.00

PIPELINE—TRAINING COURSE

Oil and Gas Pipeline Fundamentals
www.api-u.org/PipelineFundamentals.html

This two day course; designed, produced, and taught by pipeline industry veteran Tom Miesner, former president of Conoco Pipe Line Company and author of Oil and Gas Pipelines in NonTechnical Language explains the industry and how pipelines work in straightforward language. "Limiting the use of equations while providing pictures, charts, graphs, and examples really made this course come alive for me," said a recent class participant.

SECURITY

API Standard for Third Party Network Connectivity

Provides guidance for implementing secure third-party connections between the information technology systems and network of two companies that have a business relations and a common objective. The standard will provide suggestions for companies to establish third-party network connections while protecting their individual systems and data from unauthorized access or manipulation. Pages: 36

October 2007 | Product Number: TSTP01 | Price: $87.00

Security Guidance for the Petroleum Industry

API's Second Edition of "Security Guidance for the Petroleum Industry," is now in use at oil and gas facilities around the world to help managers decide how to deter terrorist attacks. Covering all segments of the industry (production, refining, transportation, pipeline, and marketing), this guidance builds on the existing solid foundation of design and operational regulations, standards, and recommended practices, which relate to facility design and safety, environmental protection, emergency response, and protection from theft and vandalism. Produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies, these guidelines, viewed as a living document, are broadly applicable to facility security in light of September 11, 2001, and provide the starting point for developing security plans at oil and natural gas facilities and operations. Pages: 169

2nd Edition | March 2003 | Product Number: OS0001 | Price: $185.00

Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

The American Petroleum Institute and the National Petrochemical & Refiners Association jointly developed a new methodology for evaluating the likelihood and consequences of terrorist attacks against refineries and petrochemical facilities. "Security Vulnerability Assessment Methodology for Petroleum and Petrochemical Facilities" is designed for companies to use in assessing vulnerabilities and potential damages from different kinds of terrorist attacks. In the post September 11 era, companies have reevaluated and enhanced security at their facilities. The methodology will provide officials with a new analytical tool to determine "the likelihood of an adversary successfully exploiting vulnerability and the resulting degree of damage or impact." This vulnerability assessment methodology was produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies. Pages: 155

October 2004 | Product Number: OSVA02 | Price: $185.00

SECURITY—TRAINING COURSES

Workshop on Industry Security Vulnerability Assessments (SVAs)
www.api-u.org/SVA.html

API presents the leading SVA training for the petroleum, petrochemical and chemical industries. The objective of an SVA is to identify security hazards, threats and vulnerabilities facing a facility and to evaluate the countermeasures to provide for the protection of the public, workers, national interests, the environment, and the company.

Workshop on USCG Regulations for Facility Security Officers (FSOs)
www.api-u.org/FSO.html

Learn about the requirements for Facility Security Officers released in the U.S. Coast Guard (USCG) Final Rule: Part 105, Subpart B. Course materials include a reference CD of over 30 helpful related documents including the regulation, NVICs, API's "Security Vulnerability Assessment for the Petroleum & Petrochemical Industries", and numerous DHS bulletins.

If you have any questions or comments regarding API standards, please visit www.api.org/standards.

NOTE: Free publications with an asterisk are subject to a $10.00 handling charge for each total order, plus actual shipping charges.

INSPECTION OF REFINERY EQUIPMENT

API 510 ◆
Pressure Vessel Inspection Code: Maintenance Inspection, Rating, Repair, and Alteration
(ANSI/API 510-2006)
(Purchase includes addenda to the current edition of the code.)

Covers the in-service inspection, repair, alteration, and rerating activities for pressure vessels and the pressure- relieving devices protecting these vessels. This inspection code applies to most refining and chemical process vessels that have been placed in service. This includes:

- vessels constructed in accordance with an applicable construction code;
- vessels constructed without a construction code (non-code)-A vessel not fabricated to a recognized construction code and meeting no known recognized standard;
- vessels constructed and approved as jurisdictional special based upon jurisdiction acceptance of particular design, fabrication, inspection, testing, and installation;
- nonstandard vessels-A vessel fabricated to a recognized construction code but has lost its nameplate or stamping. Pages: 56

9th Edition | June 2006 | Product Number: C51009 | Price: $146.00

API 510 ◆
Pressure Vessel Inspection Code: Maintenance Inspection, Rating, Repair, and Alteration—Chinese

Chinese translation of API 510.

9th Edition | June 2006 | Product Number: C51009C | Price: $154.00

API 570 ◆■
Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems
(Purchase includes addenda to the current edition of the code.)

Covers the inspection, rating, repair, and alteration procedures for metallic and FRP piping systems and their associated pressure relieving devices that have been in-service.

The intent of this code is to specify the in-service inspection and condition-monitoring program that is needed to determine the integrity of piping. That program should provide reasonably accurate and timely assessments to determine if any changes in the condition of piping could possibly compromise continued safe operation.

API 570 was developed for the petroleum refining and chemical process industries but may be used, where practical, for any piping system. It is intended for use by organizations that maintain or have access to an authorized inspection agency, a repair organization, and technically qualified piping engineers, inspectors, and examiners. Intended for use by organizations that maintain or have access to an authorized inspection agency, repair organization, and technically qualified personnel. May be used, where practical, for any piping system. Piping inspectors are to be certified as stated in this inspection code. Pages: 65

3rd Edition | November 2009 | Product Number: C57003 | Price: $130.00

RP 571 ◆
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry

Provides background information on damage that can occur to equipment in the refining process. It is intended to supplement Risk Based Inspection (RP 580 and Publ 581) and Fitness-for-Service (RP 579) technologies developed in recent years by API to manage existing refining equipment integrity. It is also an excellent reference for inspection, operations, and maintenance personnel.

Covers over 60 damage mechanism. Each write-up consists of a general description of the damage, susceptible materials, of construction, critical factors, inspection method selection guidelines, and control measures. Wherever possible, pictures are included and references are provided for each mechanism. In addition, generic process flow diagrams have been included that contain a summary of the major damage flow mechanism expected for typical refinery process units. Pages: 257

1st Edition | December 2003 | Product Number: C57101 | Price: $227.00

RP 571 ◆
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Chinese

The Chinese translation of RP 571.

1st Edition | December 2003 | Product Number: C57101C | Price: $238.00

RP 571
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry —German

The German translation of RP 571.

1st Edition | December 2003 | Product Number: C57101G | Price: $238.00

RP 572 ◆■
Inspection Practices for Pressure Vessels

Covers the inspection of pressure vessels. It includes a description of the various types of pressure vessels (including pressure vessels with a design pressure below 15 psig) and the standards for their construction and maintenance. RP 572 also includes reasons for inspection, causes of deterioration, frequency and methods of inspection, methods of repair, and preparation of records and reports. Pages: 136

3rd Edition | November 2009 | Product Number: C57203 | Price: $149.00

RP 573
Inspection of Fired Boilers and Heaters

Covers the inspection practices for fired boilers and process heaters (furnaces) used in petroleum refineries and petrochemical plants. The practices described in this document are focused to improve equipment reliability and plant safety by describing the operating variables which impact reliability, and to ensure that inspection practices obtain the appropriate data, both on-stream and off-stream, to assess current and future performance of the equipment. Pages: 69

2nd Edition | December 2002 | Product Number: C57302 | Price: $94.00

RP 574 ◆■
Inspection Practices for Piping System Components

Supplements API 570 by providing piping inspectors with information that can improve skill and increase basic knowledge and practices. This RP describes inspection practices for piping, tubing, valves (other than control valves), and fittings used in petroleum refineries and chemical plants. Common piping components, valve types, pipe joining methods, inspection planning processes, inspection intervals and techniques, and types of records are described to aid the inspector in fulfilling their role implementing API 570. This publication does not cover inspection of specialty items, including instrumentation and control valves. Pages: 88

3rd Edition | November 2009 | Product Number: C57403 | Price: $132.00

RP 575 ◆
Inspection of Atmospheric & Low Pressure Storage Tanks
(ANSI/API RP 575-2004)

Covers the inspection of atmospheric and low-pressure storage tanks that have been designed to operate at pressures from atmospheric to 15 psig. Includes reasons for inspection, frequency and methods of inspection, methods of repair, and preparation of records and reports. This recommended practice is intended to supplement API Standard 653, which covers the minimum requirements for maintaining the integrity of storage tanks after they have been placed in service. Pages: 60

2nd Edition | April 2005 | Product Number: C57502 | Price: $126.00

RP 575 ◆
Inspection of Atmospheric & Low Pressure Storage Tanks—Chinese

The Chinese Translation of RP 575.

2nd Edition | April 2005 | Product Number: C57502C | Price: $132.00

RP 576 ◆■
Inspection of Pressure-relieving Devices

Describes the inspection and repair practices for automatic pressure-relieving devices commonly used in the oil and petrochemical industries. As a guide to the inspection and repair of these devices in the user's plant, it is intended to ensure their proper performance. This publication covers such automatic devices as pressure-relief valves, pilot-operated pressure-relief valves, rupture disks, and weight-loaded pressure-vacuum vents.

The scope of this RP includes the inspection and repair of automatic pressure-relieving devices commonly used in the oil and petrochemical industry. This publication does not cover weak seams or sections in tanks, explosion doors, fusible plugs, control valves, and other devices that either depend on an external source of power for operation or are manually operated. Inspections and tests made at manufacturers' plants, which are usually covered by codes or purchase specifications, are not covered by this publication.

This publication does not cover training requirements for mechanics involved in the inspection and repair of pressure-relieving devices. Those seeking these requirements should see API 510, which gives the requirements for a quality control system and specifies that the repair organization maintain and document a training program ensuring that personnel are qualified. Pages: 65

3rd Edition | November 2009 | Product Number: C57603 | Price: $130.00

RP 577 ◆
Welding Inspection and Metallurgy

Provides guidance to the API authorized inspector on welding inspection as encountered with fabrication and repair of refinery and chemical plant equipment and piping. Common welding processes, welding procedures, welder qualifications, metallurgical effects from welding, and inspection techniques are described to aid the inspector in fulfilling their role implementing API 510, API 570, API Std 653 and API RP 582. The level of learning and training obtained from this document is not a replacement for the training and experience required to be an American Welding Society (AWS) Certified Welding Inspector (CWI). Pages: 100

1st Edition | October 2004 | Product Number: C57701 | Price: $164.00

RP 577 ◆
Welding Inspection and Metallurgy—Chinese

The Chinese translation of RP 577.

1st Edition | October 2004 | Product Number: C57701C | Price: $172.00

RP 578 ◆
Material Verification Program for New and Existing Alloy Piping Systems
(ANSI/API RP 578-1999)

Provides guidelines for a material quality assurance system to verify the consistency between the nominal composition of alloy components within the pressure envelop of a process piping system with the selected or specified construction materials to minimize the potential for catastrophic release of toxic or hazardous liquids or vapors. Presents material control and verification programs on ferrous and nonferrous alloys during construction, installation, maintenance, and inspection of new and existing process piping systems covered under the ASME B31.3 and API 570 codes. Applies to metallic alloy materials purchased for use either by the owner/user or indirectly through vendors, fabricators, or contractors, and includes the supply, fabrication and erection of these materials. Carbon steel components specified in new or existing piping systems are not covered under the scope of this document.

1st Edition | May 1999 | Product Number: C57801 | Price: $118.00

RP 578 ◆
Material Verification Program for New and Existing Alloy Piping Systems—Chinese

The Chinese translation of RP 578.

1st Edition | May 1999 | Product Number: C57801C | Price: $124.00

Std 579-1/ASME FFS-1
Fitness-For-Service

Describes standardized fitness-for-service assessment techniques for pressurized equipment used in the petrochemical industry. Fitness-for-service is defined as the ability to demonstrate the structural integrity of an in-service component containing a flaw. This publication is intended to supplement the requirements in API 510, 570, and 653 by: (i) ensuring safety of plant personnel and the public while older equipment continues to operate; (ii) providing technically sound fitness-for-service assessment procedures to ensure that different service providers furnish consistent life predictions; and (iii) helping optimize maintenance and operation of existing facilities to maintain the availability of older plants and enhance their long term economic viability.

The assessment procedures in this publication can be used for fitness-for-service evaluation and rerating of pressure vessels designed and constructed to the ASME Boiler and Pressure Vessel Code; piping systems designed and constructed to the ASME B31.3 Piping Code; and aboveground storage tanks designed and constructed to API 650 and 620. The assessment procedures cover the present integrity of pressure containing equipment given a current state of damage and the projected remaining life. This publication can also be applied to pressure containing equipment constructed to other recognized codes and standards as defined in this publication.

2nd Edition | June 2007
Hard Copy only Price: $704.00
CD only Price: $839.00
Hard Copy and CD Price: $1,133.00

API 579-2/ASME FFS-2 ■
Example Problem Manual

Fitness-For-Service (FFS) assessments in API 579-1/ASME FFS-1 *Fitness-For-Service* are engineering evaluations that are performed to demonstrate the structural integrity of an in-service component that may contain a flaw or damage or that may be operating under specific conditions that could produce a failure. API 579 -1/ASME FFS-1 provides guidance for conducting FFS assessments using methodologies specifically prepared for pressurized equipment. The guidelines provided in this standard may be used to make run-repair-replace decisions to help determine if pressurized equipment containing flaws that have been identified by inspection can continue to operate safely for some period of time. These FFS assessments of API 579-1/ASME FFS-1 are currently recognized and referenced by the API Codes

and Standards (510, 570, & 653), and by NB-23 as suitable means for evaluating the structural integrity of pressure vessels, piping systems and storage tanks where inspection has revealed degradation and flaws in the equipment or where operating conditions suggest that a risk of failure may be present.

Example problems illustrating the use and calculations required for Fitness-For-Service Assessments described in API 579-1/ASME FFS-1 are provided in this document. Example problems are provided for all calculation procedures in both SI and US Customary units.

An introduction to the example problems in this document is described in Part 2 of this Standard. The remaining parts of this document contain the example problems. The parts in this document coincide with the Parts in API 579-1/ASME FFS-1. For example, example problems illustrating calculations for local thin areas are provided in Part 5 of this document. This coincides with the assessment procedures for local thin areas contained in Part 5 of API 579-1/ASME FFS-1 Pages: 366

1st Edition | August 2009 | Product Number: C57921 | Price: $150.00

RP 580 ◆■
Risk-Based Inspection

Provides users with the basic elements for developing and implementing a risk-based inspection (RBI) program for fixed equipment and piping in the hydrocarbon and chemical process industries. RP 580 is intended to supplement API 510, *Pressure Vessel Inspection Code*, API 570, *Piping Inspection Code,* and API 653, *Tank Inspection, Repair, Alteration and Reconstruction*. These API inspection codes and standards allow an owner/user latitude to plan an inspection strategy and increase or decrease the code-designated inspection frequencies based on the results of a RBI assessment. Pages: 83

2nd Edition | November 2009 | Product Number: C58002 | Price: $183.00

RP 581
Risk-Based Inspection Technology

API has researched and developed an approach to risk-based inspection (RBI). This document details the procedures and methodology of RBI. RBI is an integrated methodology that uses risk as a basis for prioritizing and managing an in-service equipment inspection program by combining both the likelihood of failure and the consequence of failure. Utilizing the output of the RBI, the user can design an inspection program that manages or maintains the risk of equipment failures. The following are three major goals of the RBI program:

1. Provide the capability to define and quantify the risk of process equipment failure, creating an effective tool for managing many of the important elements of a process plant.

2. Allow management to review safety, environmental, and business-interruption risks in an integrated, cost-effective manner.

3. Systematically reduce the likelihood and consequence of failure by allocating inspection resources to high risk equipment. The RBI methodology provides the basis for managing risk, by making informed decisions on the inspection method, coverage required and frequency of inspections. In most plants, a large percent of the total unit risk will be concentrated in a relatively small percent of the equipment items. These potential high risk components may require greater attention, perhaps through a revised inspection plan. With an RBI program in place, inspections will continue to be conducted as defined in existing working documents, but priorities and frequencies will be guided by the RBI procedure. The RBI analysis looks not only at inspection, equipment design, and maintenance records, but also at numerous process safety management issues and all other significant issues that can affect the overall mechanical integrity and safety of a process unit. Pages: 607

2nd Edition | September 2008 | Product Number: C58102
Hard Copy Only Price: $721.00
CD Only Price: $824.00
Hard Copy and CD Price: $1,133.00

API Risk-Based Inspection Software

API RBI software, created by petroleum refinery and chemical plant owner/users for owner/users, finds its basis in API Publication 581, *Base Resource Document—Risk Based Inspection*. Practical, valuable features are built into technology, which is based on recognized and generally accepted good engineering practices.

The purposes of the Risk-Based Inspection Program are:

- Screen operating units within a plant to identify areas of high risk.
- Estimated a risk value associated with the operation of each equipment item in a refinery or chemical process plant based on a consistent methodology.
- Prioritize the equipment based on the measured risk.
- Design highly effective inspection program.
- Systematically manage the risks associated with equilibrium failures.

The RBI method defines the risk of operating equipment as the combination of two separate terms: the consequences of failure and the likelihood of failure.

For more information: e-mail rbi@api.org or call (281) 537-8848

RP 582 ■
Recommended Practice Welding Guidelines for the Chemical, Oil, and Gas Industries

Provides supplementary guidelines and practices for welding and welding related topics for shop and field fabrication, repair and modification of the following: a) pressure-containing equipment such as pressure vessels, heat exchangers, piping, heater tubes, and pressure boundaries of rotating equipment and attachments welded thereto; b) tanks and attachments welded thereto; c) nonremovable internals for process equipment; d) structural items attached and related to process equipment; e) other equipment or component item when referenced by an applicable purchase document. This document is general in nature and is intended to augment the welding requirements of ASME BPVC Section IX and similar codes, standards, specifications and practices such as those listed in Section 2. The intent of this document is to be inclusive of chemical, oil and gas industry standards, although there are many areas not covered herein, e.g. pipeline welding and offshore structural welding are intentionally not covered. This document is based on industry experience and any restrictions or limitations may be waived or augmented by the purchaser. Pages: 28

2nd Edition | December 2009 | Product Number: C58202 | Price: $120.00

Std 653 ◆■
Tank Inspection, Repair, Alteration, and Reconstruction
(purchase includes addenda to the current edition of the standard)

Covers the inspection, repair, alteration, and reconstruction of steel aboveground storage tanks used in the petroleum and chemical industries. Provides the minimum requirements for maintaining the integrity of welded or riveted, nonrefrigerated, atmospheric pressure, aboveground storage tanks after they have been placed in service. Pages: 152

4th Edition | April 2009 | Product Number: C65304 | Price: $205.00

Std 653 ◆
Tank Inspection, Repair, Alteration, and Reconstruction—Chinese

The Chinese translation of Std 653.

4th Edition | April 2009 | Product Number: C65304C | Price: $215.00

INSPECTION OF REFINERY EQUIPMENT—TRAINING COURSES

Fitness-For-Service (FFS) based on API RP 579
www.api-u.org/ffs.html

The instructors, who are also the principal authors of RP 579, give their insights into the background and logic behind the assessment procedures. In addition, both courses include other highlights: Discussion of damage mechanisms and the importance of identification, Various detailed inspection techniques for damage mechanisms, with focus on flaw characterization (this is not covered in the 1 1/2-day course). Overview of remaining life assessment, remediation, and methods to extend the life of damaged equipment, Presentation of practical examples of FFS procedures, Details on how to assess damage/flaws that are not directly covered in API 579.

Risk-Based Inspection (RBI) based on API RP 580/581
www.api-u.org/rbi.html

Using semi-quantitative and quantitative approaches, the course covers technical content that is both broad and deep. Class discussions are an effective way for students to gain insights about the focus of various RBI methods and parameters to include in an effective analytical program.

Damage Mechanisms In Refining based on API RP 571
www.api-u.org/damage_mechanisms.html

This course, which Is taught by the primary authors of API's RP 571, includes many special features: an overview of basic metallurgy applicable to refinery construction materials, a description of common refining processes on the process flow diagram level, highlighting where various damage mechanisms are usually observed, an analysis of typical nde methods and their ability to detect and characterize equipment damage, detailed discussions of the more than 60 damage mechanisms that are found in refineries covered by RP 571, examples of equipment damage and failures, as well as learning exercises for students.

MECHANICAL EQUIPMENT STANDARDS FOR REFINERY SERVICE

Std 610/ISO 13709:2003
Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries

(ANSI/API Std 610-2004)

Specifies requirements for centrifugal pumps, including pumps running in reverse as hydraulic power recovery turbines, for use in petroleum, petrochemical, and gas industry process services. It does not cover sealless pumps. This International Standard is applicable to overhung pumps, between bearings pumps, and vertically suspended pumps (see Table 1). Clause 8 applies to specific types of pumps. All other clauses of this International Standard apply to all pump types. The figures in 4.1 show the various specific pump types and the designations assigned to each specific type.

This edition of API 610 is the identical national adoption of ISO 13709:2003, *Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries.* Pages: 184

10th Edition | October 2004 | Product Number: CX61010 | Price: $228.00

Std 611
General Purpose Steam Turbines for Petroleum, Chemical, and Gas Industry Services

Covers the minimum requirements for general-purpose steam turbines. These requirements include basic design, materials, related lubrication systems, controls, auxiliary equipment, and accessories. General-purpose turbines are horizontal or vertical turbines used to drive equipment that is usually spared, is relatively small in size, or is in non-critical service. They are generally used where steam conditions will not exceed a pressure of 48 bar (700 psig) and a temperature of 400 °C (750 °F) or where speed will not exceed 6000 rpm. Pages: 118

5th Edition | March 2008 | Effective Date: March 18, 2008
Product Number: C61105 | Price: $142.00

Std 612/ISO 10437:2003
Petroleum, petrochemical and natural gas industries—Steam turbines—Special-purpose applications

(ANSI/API Std 612-2005)

Specifies requirements and gives recommendations for the design, materials, fabrication, inspection, testing and preparation for shipment for special-purpose steam turbines. It also covers the related lube-oil systems, instrumentation, control systems and auxiliary equipment. It is not applicable to general-purpose steam turbines, which are covered in API 611.

This edition of Std 612 is the identical national adoption of ISO 10437:2003, *Petroleum, petrochemical and natural gas industries—Steam turbines—Special-purpose applications.* Pages: 113

6th Edition | November 2005 | Product Number: CX61206 | Price: $192.00

Std 613
Special Purpose Gear Units for Petroleum, Chemical and Gas Industry Services

(ANSI/API Std 613-2002)
(includes Errata dated November 2006)

Covers the minimum requirements for special-purpose, enclosed, precision, single- and double-helical one-and two-stage speed increasers and reducers of parallel-shaft design for refinery services. Primarily intended for gears that are in continuous service without installed spare equipment. Pages: 94

5th Edition | February 2003 | Reaffirmed: December 2, 2008
Product Number: C61305 | Price: $160.00

Std 614/ISO 10438-1:2007
Lubrication, Shaft-Sealing, and Control-Oil Systems and Auxiliaries for Petroleum, Chemical and Gas Industry Services

Petroleum petrochemical and natural gas industries—Lubrication, shaft-sealing and control-oil systems and auxiliaries—Part 1: General requirements
(includes Errata, dated May 2008)

Covers the minimum requirements for General Purpose and Special Purpose Oil Systems. The standard also includes requirements for Self-acting Gas Seal Support Systems. The standard includes the systemsí components, along with the required controls and instrumentation. Data sheets and typical schematics of both system components and complete systems are also provided. Chapters included in API 614 include: 1. General Requirements; 2. Special-purpose Oil Systems; 3. General-purpose Oil Systems; and 4. Self-acting Gas Seal Support Systems.

This edition of Std 614 is the identical national adoption of ISO 10438:2007, *Petroleum petrochemical and natural gas industries—Lubrication, shaft-sealing and control-oil systems and auxiliaries—Part 1: General requirements*. Pages: 202

5th Edition | April 2008 | Product Number: CX61402 | Price: $284.00

Std 616
Gas Turbines for the Petroleum, Chemical and Gas Industry Services

Covers the minimum requirements for open, simple, and regenerative-cycle combustion gas turbine units for services of mechanical drive, generator drive, or process gas generation. All auxiliary equipment required for operating, starting, and controlling gas turbine units and for turbine protection is either discussed directly in this standard or referred to in this standard through references to other publications. Specifically, gas turbine units that are capable of continuous service firing gas or liquid fuel or both are covered by this standard. Pages: 87

4th Edition | August 1998 | Product Number: C61604 | Price: $166.00

Std 617
Axial and Centrifugal Compressors and Expander-compressors for Petroleum, Chemical and Gas Industry Services
(ANSI/API Std. 617-2002)
(includes Errata dated June 2003)

Covers the minimum requirements for centrifugal compressors used in petroleum, chemical, and gas industry services that handle air or gas, including process gear mounted. Does not apply to fans or blowers that develop less than 34 kPa (5 psi) pressure rise above atmospheric pressure; these are covered by API Standard 673. This standard also does not apply to packaged, integrally-geared centrifugal air compressors, which are covered by API Standard 672. Pages: 193

7th Edition | July 2002 | Reaffirmed: January 1, 2009
Product Number: C61707 | Price: $212.00

Std 618
Reciprocating Compressors for Petroleum, Chemical and Gas Industry Services

Covers the minimum requirements for reciprocating compressors and their drivers used in petroleum, chemical, and gas industry services for handling process air or gas with either lubricated or nonlubricated cylinders. Compressors covered by this standard are of moderate-to-low speed and in critical services. Also covered are related lubricating systems, controls, instrumentation, intercoolers, aftercoolers, pulsation suppression devices, and other auxiliary equipment. Pages: 190

5th Edition | December 2007 | Product Number: C61805 | Price: $175.00

Std 619
Rotary-Type Positive Displacement Compressors for Petroleum, Petrochemical and Natural Gas Industries

Covers the minimum requirements for dry and flooded helical lobe rotary compressors used for vacuum or pressure or both in petroleum, chemical, and gas industry services. It is primarily intended for compressors that are in special purpose applications, and does not cover portable air compressors, liquid ring compressors and vane-type compressors. This edition also includes a new Inspector's Checklist and new schematics for general purpose and typical oil systems. Pages: 134

4th Edition | December 2004 | Product Number: C61904 | Price: $190.00

Std 671/ISO 10441:2007
Special Purpose Couplings for Petroleum, Chemical and Gas Industry Services
Petroleum petrochemical and natural gas industries—Flexible couplings for mechanical power transmission—Special purpose applications

Specifies the requirements for couplings for the transmission of power between the rotating shafts of two machines in special-purpose applications in the petroleum, petrochemical and natural gas industries. Such applications are typically in large and/or high speed machines, in services that can be required to operate continuously for extended periods, are often unspared and are critical to the continued operation of the installation. By agreement, it can be used for other applications or services.

Couplings covered are designed to accommodate parallel (or lateral) offset, angular misalignment and axial displacement of the shafts without imposing unacceptable mechanical loading on the coupled machines. It is applicable to gear, metallic flexible element, quill shaft and torsionally resilient type couplings. Torsional damping and resilient type couplings are detailed in Annex A; gear-type couplings are detailed in Annex B and quill shaft style coupling are detailed in Annex C. Also covers the design, materials of construction, manufacturing quality, inspection and testing special purpose couplings.

This edition of Std 671 is the identical national adoption of ISO 10441:2007, *Petroleum petrochemical and natural gas industries—Flexible couplings for mechanical power transmission—Special purpose applications*. Pages: 56

4th Edition | August 2007 | Product Number: C67104 | Price: $162.00

Std 672
Packaged, Integrally Geared Centrifugal Air Compressors for Petroleum, Chemical, and Gas Industry Services
(includes Errata dated October 2007)

Covers the minimum requirements for constant-speed, packaged, general purpose integrally geared centrifugal air compressors, including their accessories. This standard is not applicable to machines that develop a pressure rise of less than 0.35 bar (5.0 psi) above atmospheric pressure, which are classed as fans or blowers. Pages: 136

4th Edition | March 2004 | Reaffirmed: December 19, 2008
Product Number: C67204 | Price: $228.00

Std 673
Centrifugal Fans for Petroleum, Chemical and Gas Industry Services
(includes Errata dated January 2002)

Covers the minimum requirements for centrifugal fans intended for continuous duty in petroleum, chemical, and gas industry services. Fan pressure rise is limited to differential from a single impeller, usually not exceeding 100 inches of water Equivalent Air Pressure (EAP). Cooling tower, aerial cooler, and ventilation fans; and positive displacement blowers are NOT covered by this standard. Pages: 89

2nd Edition | November 2001 | Product Number: C67302 | Price: $146.00

Std 674
Positive Displacement Pumps-Reciprocating

Covers the minimum requirements for reciprocating positive displacement pumps for use in petroleum, chemical, and gas industry services. Both direct-acting and power-frame types are included. Pages: 66

2nd Edition | June 1995 | Product Number: C67402 | Price: $137.00

Std 675
Positive Displacement Pumps—Controlled Volume

Covers the minimum requirements for controlled volume positive displacement pumps for use in service in the petroleum, chemical, and gas industries. Both packed-plunger and diaphragm types are included. Diaphragm pumps that use direct mechanical actuation are excluded. Pages: 38

2nd Edition | October 1994 | Effective Date: October 1, 1994
Reaffirmed: June 1, 2005 | Product Number: C67502 | Price: $111.00

Std 676 ■
Positive Displacement Pumps—Rotary

Covers the minimum requirements for rotary positive displacement process pumps and pump units for use in the petroleum, petrochemical, and gas industry services. Controlled-volume pumps, hydraulically driven pumps and positive displacement reciprocating pumps are not included (see API 674 for positive displacement reciprocating pumps and API 675 for controlled-volume pumps).

For rotary positive displacement pumps in auxiliary services (e.g. lube oil systems), manufacturer's standard with demonstrated experience is acceptable.

Annex A contains datasheets which purchasers are encouraged to use (informative). Annex B provides guidance for factors affecting twin screw efficiencies (informative). Annex C contains an inspector's checklist (informative). Annex D contains forms which may be used to indicate vendor drawing and data requirements (VDDRs) (informative). Annex E gives guidance regarding net positive suction head (NPSH) vs net positive inlet pressure (NPIP) (informative). Annex F gives guidance on pulsation and vibration control techniques (informative). Annex G provides a typical piping and instrumentation diagram for multiphase pump (MPP) skids (informative). This standard requires the purchaser to specify certain details and features. Pages: 102

3rd Edition | November 2009 | Product Number: C67603 | Price: $145.00

Std 677
General-Purpose Gear Units for Petroleum, Chemical and Gas Industry Services

Covers the minimum requirements for general-purpose, enclosed, single and multistage gear units incorporating parallel shaft helical and right angle spiral bevel gears for the petroleum, chemical, and gas industries. Gears manufactured according to this standard shall be limited to the following pitchline velocities. Helical gears shall not exceed 60 meters per second (12,000 feet per minute), and spiral bevels shall not exceed 40 meters per second (8,000 feet per minute). Spiral bevel gearsets shall be considered matched sets. Not intended to apply to gears in special-purpose service, which are covered in API Standard 613; to gears integral with other equipment; to epicyclic gear assemblies; or gears with non-involute tooth forms. Typical applications for which this standard is intended are cooling tower water pump systems, forced and induced draft fan systems, and other general-purpose equipment trains. Pages: 84

3rd Edition | April 2006 | Product Number: C67703 | Price: $160.00

Std 681
Liquid Ring Vacuum Pumps and Compressors

Defines the minimum requirements for the basic design, inspection, testing, and preparation for shipment of liquid ring vacuum pump and compressor systems for service in the petroleum, chemical, and gas industries. It includes both vacuum pump and compressor design and system design. Pages: 86

1st Edition | February 1996 | Reaffirmed: June 1, 2002
Product Number: C68101 | Price: $137.00

Std 682/ISO 21049:2004
Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps
(ANSI/API Std 682-2004)
(includes Errata dated November 2006)

Specifies requirements and gives recommendations for sealing systems for centrifugal and rotary pumps used in the petroleum, natural gas and chemical industries. It is applicable to hazardous, flammable and/or toxic services where a greater degree of reliability is required for the improvement of equipment availability and the reduction of both emissions to the atmosphere and life-cycle sealing costs. It covers seals for pump shaft diameters from 20 mm (0.75 in.) to 110 mm (4.3 in.). This Standard is also applicable to seal spare parts and can be referred to for the upgrading of existing equipment. A classification system for the seal configurations covered by this International Standard into categories, types, arrangements and orientations is provided.

This edition of Std 682 is the identical national adoption of ISO 21049:2004, *Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps.* Pages: 195

3rd Edition | September 2004 | Product Number: CX68203 | Price: $224.00

Publ 684
Tutorial on the API Standard Paragraphs Covering Rotor Dynamics and Balance
(An Introduction to Lateral Critical and Train Torsional Analysis and Rotor Balancing)

Describes, discusses, and clarifies the section of the API Standard Paragraphs that outlines the complete rotor dynamics acceptance program. The acceptance program was designed by API to ensure equipment mechanical reliability. This document is an introduction to the major aspects of rotating equipment vibrations that are addressed during a typical lateral dynamics analysis. Pages: 303

2nd Edition | August 2005 | Product Number: C68402 | Price: $170.00

RP 686 ■
Machinery Installation and Installation Design

Intended to provide recommended procedures, practices, and checklists for the installation and precommissioning of new, existing, and reapplied machinery and to assist with the installation design of such machinery for petroleum, chemical, and gas industry services facilities. In general, this RP is intended to supplement vendor instructions and the instructions provided by the original equipment manufacturer (OEM) should be carefully followed with regard to equipment installation and checkout. Most major topics of this RP are subdivided into sections of "Installation Design" and "Installation" with the intent being that each section can be removed and used as needed by the appropriate design or installation personnel. Pages: 254

2nd Edition | December 2009 | Product Number: C68602 | Price: $181.00

RP 687
Rotor Repair

Covers the minimum requirements for the inspection and repair of special purpose rotating equipment rotors, bearings and couplings used in petroleum, chemical, and gas industry service. Pages: 540

1st Edition | September 2001 | Reaffirmed: January 1, 2009
Product Number: C68701 | Price: $259.00

RP 687
Rotor Repair—Data CD

CD-ROM containing all datasheets from RP 687.

1st Edition | September 2001 | Product Number: C68701 | Price: $239.00

Std 689/ISO 14224:2006
Collection and Exchange of Reliability and Maintenance Data for Equipment
Petroleum and natural gas industries—Collection and exchange of reliability and maintenance data for equipment

Provides a comprehensive basis for the collection of reliability and maintenance (RM) data in a standard format for equipment in all facilities and operations within the petroleum, natural gas and petrochemical industries during the operational life cycle of equipment. It describes data-collection principles and associated terms and definitions that constitute "reliability language" that can be useful for communicating operational experience. The failure modes defined in the normative part of this standard can be used as a "reliability thesaurus" for various quantitative as well as qualitative applications. This standard also describes data quality control and assurance practices to provide guidance for the user. contractors. API 689 establishes requirements that any inhouse or commercially available RM data system is required to meet when designed for RM data exchange. Examples, guidelines and principles for the exchange and merging of such RM data are addressed.

This edition of Std 689 is the identical national adoption of ISO 14224:2006, *Petroleum and natural gas industries—Collection and exchange of reliability and maintenance data for equipment.* Pages: 171

1st Edition | July 2007 | Product Number: CC68901 | Price: $206.00

MECHANICAL EQUIPMENT—TRAINING COURSES

Rotor Repair based on API 687
www.api-u.org/rotorrepair.html

The API Rotor Repair Course, based on API standard 687, covers the minimum requirements for the inspection and repair of rotating equipment rotors, bearings, and couplings used in the petroleum, chemical and gas industry services.

Specifying Reliable Cost Effective Machinery Designs
www.api-u.org/MechEquip.html

Take advantage of over 800 man years of expert experience in specifying, design, testing, installation and repair of rotating equipment by attending this new course covering the API Mechanical Equipment Standards. Learn the API mechanical equipment standard requirements, the reasons behind the requirements and how to knowledgably apply these specifications.

EQUIPMENT DATASHEETS

Electronically Formatted Mechanical Equipment Standards Datasheets are now available in electronic format (Excel 5.0 spreadsheets):

All of the following Datasheets are available for single user at $57.00 each or for intranet licensing at $299.00 each.

Std 537	2nd Edition	Std 660	8th Edition
Std 546	2nd Edition	Std 662	2nd Edition
Std 560	4th Edition	Std 670	5th Edition
Std 610	10th Edition	Std 671	4rd Edition
Std 611	5th Edition	Std 672	4rd Edition
Std 612	6th Edition	Std 673	2nd Edition
Std 613	5th Edition	Std 674	2nd Edition
Std 614	5th Edition	Std 675	2nd Edition
Std 616	4th Edition	Std 676	2nd Edition
Std 617	7th Edition	Std 677	3rd Edition
Std 618	5th Edition	Std 682	3rd Edition
Std 619	4th Edition	Std 685	1st Edition

Mechanical Equipment Residual Unbalance Worksheets

Electronic versions of the Residual Unbalance Worksheets that appear in Mechanical Equipment standards (Excel) along with instructions (Word).

Price: $111.00

The API Specification Database

The American Petroleum Institute Specification Database Software™ provides a knowledge-management toolset for the project engineering team. Facilitate the entire equipment specification process including the entry of process data and release to design to the final entry of mechanical data sheets and development of the technical bid specification package. Electronic outputs can be combined to form a master technical specification bid package for quotation and purchasing purposes with a modern tree-view format for ease of navigation. Completed projects provide on-going documentation for plant equipment assets—improving safety and reliability. Available in a full-featured corporate wide Oracle® format or a portable ODBC database format with primary focus on equipment datasheets.

Contact EPCON International at (281) 398-9400
or visit the EPCON website at: www.epcon.com

STORAGE TANKS

Std 620
Design and Construction of Large, Welded, Low-Pressure Storage Tanks

The API Downstream Segment has prepared this standard to cover large, field-assembled storage tanks of the type described in 1.2 that contain petroleum intermediates (gases or vapors) and finished products, as well as other liquid products commonly handled and stored by the various branches of the industry. The rules presented in this standard cannot cover all details of design and construction because of the variety of tank sizes and shapes that may be constructed. Where complete rules for a specific design are not given, the intent is for the Manufacturer—subject to the approval of the Purchaser's authorized representative—to provide design and construction details that are as safe as those which would otherwise be provided by this standard. Pages: 254

11th Edition | February 2008 | Product Number: C62011 | Price: $353.00

Std 650 ◆
Welded Tanks for Oil Storage
(Purchase includes addenda to the current edition of the standard.)

Establishes minimum requirements for material, design, fabrication, erection, and testing for vertical, cylindrical, aboveground, closed and open top wielded carbon or stainless steel storage tanks in various sizes and capacities for internal pressures approximating atmospheric pressure (internal pressures not exceeding the weight of the roof plates), but a higher internal pressure is permitted when addition requirements are met. This standard applies only to tanks whose entire bottom is uniformly supported and to tanks in non-refrigerated service that have a maximum design temperature of 93 °C (200 °F) or less. Pages: 376

11th Edition | June 2007 | Product Number: C65011 | Price: $425.00

Std 650 ◆
Welded Tanks for Oil Storage—Chinese

The Chinese translation of Std 650.

11th Edition | June 2007 | Product Number: C65011C | Price: $446.00

RP 651 ◆
Cathodic Protection of Aboveground Storage Tanks
(ANSI/API RP 651-2006)

Presents procedures and practices for achieving effective corrosion control on aboveground steel storage tank bottoms through the use of cathodic protection. It is the intent of this recommended practice to provide information and guidance for the application of cathodic protection to existing and new storage tanks in hydrocarbon service. Specific cathodic protection designs are not provided. Certain practices recommended herein may also be applicable to tanks in other services. Corrosion control methods based on chemical control of the environment or the use of protective coatings are not covered in detail. Pages: 33

3rd Edition | January 2007 | Product Number: C65103 | Price: $102.00

RP 651 ◆
Cathodic Protection of Aboveground Storage Tanks—Chinese

Chinese Translation of RP 651.

3rd Edition | January 2007 | Product Number: C65103C | Price: $108.00

RP 652 ◆
Lining of Aboveground Petroleum Storage Tank Bottoms
(ANSI/API RP 652-2005)

Provides guidance on achieving effective corrosion control by the application of tank bottom linings in aboveground storage tanks in hydrocarbon service. It contains information pertinent to the selection of lining materials, surface preparation, lining application, cure, and inspection of tank bottom linings for existing and new storage tanks. In many cases, tank bottom linings have proven to be an effective method of preventing internal corrosion of steel tank bottoms.

Provides information and guidance specific to aboveground steel storage tanks in hydrocarbon service. Certain practices recommended herein may also applicable to tanks in other services. This recommended practice is intended to serve only as a guide and detailed tank bottom lining specifications are not included. Pages: 15

3rd Edition | October 2005 | Product Number: C65203 | Price: $113.00

RP 652 ◆
Lining of Aboveground Petroleum Storage Tank Bottoms—Chinese

The Chinese translation of RP 652.

3rd Edition | October 2005 | Product Number: C65203C | Price: $119.00

Std 653 ◆■
Tank Inspection, Repair, Alteration, and Reconstruction

Covers the inspection, repair, alteration, and reconstruction of steel aboveground storage tanks used in the petroleum and chemical industries. Provides the minimum requirements for maintaining the integrity of welded or riveted, nonrefrigerated, atmospheric pressure, aboveground storage tanks after they have been placed in service. Pages: 152

4th Edition | April 2009 | Product Number: C65304 | Price: $205.00

Std 653 ◆
Tank Inspection, Repair, Alteration, and Reconstruction—Chinese

The Chinese translation of Std 653.

4th Edition | April 2009 | Product Number: C65304C | Price: $215.00

Publ 937
Evaluation of Design Criteria for Storage Tanks with Frangible Roof Joints

Describes research that evaluated the ability of the present API 650 tank design criteria to ensure the desired frangible joint behavior. Particular questions include: (1) evaluation of the area inequality as a method to predict the buckling response of the compression ring, (2) effect of roof slope, tank diameter, and weld size on the frangible joint, and (3) effect of the relative strength of the roof-to-shell joint compared to the shell-to-bottom joint. Pages: 73

1st Edition | April 1996 | Product Number: C93701 | Price: $131.00

TR 939-D
Stress Corrosion Cracking of Carbon Steel in Fuel Grade Ethanol -- Review, Experience Survey, Field Monitoring, and Laboratory Testing

Addresses stress corrosion cracking (SCC) in carbon steel equipment used in distribution, transportation, storage, and blending of denatured fuel ethanol. API, with assistance from the Renewable Fuels Association (RFA), conducted research on the potential for metal cracking and product leakage in certain portions of the fuel ethanol distribution system. TR 939-D contains a review of existing literature, results of an industry survey on cracking events and corrosion field monitoring, information on mitigation and prevention Pages: 172

2nd Edition | May 2007 | Product Number: C939D0 | Price: $155.00

Std 2510
Design and Construction of LPG Installations

Provides minimum requirements for the design and construction of installations for the storage and handling of LPG at marine and pipeline terminals, natural gas processing plants, refineries, petrochemical plants, and tank farms. This standard covers storage vessels, loading and unloading systems, piping and related equipment. Pages: 22

8th Edition | May 2001 | Product Number: C25108 | Price: $100.00

Impact of Gasoline Blended with Ethanol on the Long-Term Structural Integrity of Liquid Petroleum Storage Systems and Components

Summarizes the results of a literature review conducted for the American Petroleum Institute on the impact of gasoline blended with ethanol on the long-term structural integrity of liquid petroleum storage systems and components. It is anticipated that the use of ethanol in motor fuels will continue to increase. This has generated interest about the potential long-term structural effects of ethanol on liquid petroleum storage systems, including underground storage tanks (USTs), underground piping, and associated components. The objective of the literature review is to determine the state of industry knowledge and research on the effects of ethanol / gasoline blends on the long-term structural integrity of UST systems and components. This review is intended to assist decision-makers on further research requirements and needed changes or supplements to existing standards for underground storage system components used for storing and dispensing gasoline blended with ethanol.

Appendix A may be purchased separately as an electronic database file. The database synopsis' and bibliographic information for all articles reviewed for the project. The report is organized by article index numbers. Reference numbers cited in this report refer to the article index number.

January 2003 | Executive Summary | 2003 | Price: $63.00
Appendix A—Literature Review | Price: $123.00

STORAGE TANKS—TRAINING COURSES

Introduction To 650 and 653 Aboveground Storage Tanks
www.api-u.org/introAST.html

This training program will provide a comprehensive introduction to API Standards 650 and 653, highlighting the most recent revisions and upcoming changes. The attendees are introduced to API 620, a tank construction standard that deals with field built tanks that are primarily designed to be used with higher storage pressures and colder storage temperature.

Training on Aboveground FRP and Plastic Storage Tanks
www.api-u.org/PlasticAST.html

Many tank owners believe that since The EPA's SPCC Program makes little mention of the tank's "material of construction" then perhaps FRP and Plastic tanks are exempt from tank integrity inspection.

Training on the Inspection of Steel Aboveground Storage Tanks (ASTs)
www.api-u.org/steelAST.html

Many small tank owners believe that API 653 does not apply to their tanks and this is very unfortunate since using this standard to inspect their tanks may lead to longer "usable tank life". Many API 653 Certified Tank Inspectors have been using 653 to inspect small tanks and have saved their customers hundreds of dollars.

Safe Tank Entry Workshop
www.api-u.org/safe_tank_entry.html

Learn to enter and work safely In aboveground petroleum storage tanks in accordance with API 2015 and 2016 in the safe tank entry workshop offered by NFPA and the American Petroleum Institute. This 2-day, interactive seminar uses video, case studies, group discussions and hands-on activities to help you learn the proper practices and procedures.

PRESSURE-RELIEVING SYSTEMS FOR REFINERY SERVICE

RP 520 Part 1
Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries—Part 1, Sizing and Selection

Applies to the sizing and selection of pressure relief devices used in refineries and related industries for equipment that has a maximum allowable working pressure of 15 psig (103 kPag) or greater. The pressure relief devices covered in this standard are intended to protect unfired pressure vessels and related equipment against overpressure from operating and fire contingencies. This standard includes basic definitions and information about the operational characteristics and applications of various pressure relief devices. It also includes sizing procedures and methods based on steady state flow of Newtonian fluids. Atmospheric and low-pressure storage tanks covered in API 2000 and pressure vessels used for the transportation of products in bulk or shipping containers are not within the scope of this standard. See API 521 for information about appropriate ways of reducing pressure and restricting heat input. The rules for overpressure protection of fired vessels are provided in ASME Section I and ASME B31.1, and are not within the scope of this standard. Pages: 135

8th Edition | December 2008 | Product Number: C52018 | Price: $241.00

RP 520 Part 2
Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries—Part II, Installation

Covers the methods of installation for pressure relief devices for equipment that has a maximum allowable working pressure (MAWP) of 15 psig (1.03 bar g) or greater. Pressure relief valves or rupture disks may be used independently or in combination with each other to provide the required protection against excessive pressure accumulation. The term "pressure relief valve" includes safety relief valves used in either compressible or incompressible fluid service, and relief valves used in incompressible fluid service. Covers gas, vapor, steam, and incompressible fluid service. Pages: 29

5th Edition | August 2003 | Product Number: C52025 | Price: $166.00

Std 521/ISO 23251:2006
Guide for Pressure-relieving and Depressuring Systems
Petroleum petrochemical and natural gas industries—Pressure-relieving and depressuring systems.

Applies to pressure-relieving and vapor depressuring systems intended for use primarily in oil refineries, although it is also applicable to petrochemical facilities, gas plants, liquefied natural gas (LNG) facilities, and oil and gas production facilities. This International Standard specifies requirements and gives guidelines for examining the principal causes of overpressure; determining individual relieving rates; and selecting and designing disposal systems, including such component parts as piping, vessels, flares, and vent stacks. This International Standard does not apply to direct-fired steam boilers. The information provided is designed to aid in the selection of the system that is most appropriate for the risks and circumstances involved in various installations. This International Standard is intended to supplement the practices set forth in API RP 520-1 or ISO 4126 for establishing a basis of design. Pages: 192

5th Edition | January 2007 | Product Number: C52105 | Price: $212.00

Std 526 ■
Flanged Steel Pressure-relief Valves

This standard is a purchase specification for flanged steel pressure-relief valves. Basic requirements are given for direct spring-loaded pressure-relief valves and pilot-operated pressure-relief valves as follows:

- orifice designation and area;
- valve size and pressure rating, inlet and outlet;
- materials;
- pressure-temperature limits;
- center-to-face dimensions, inlet and outlet.

Nameplate nomenclature and requirements for stamping are detailed in Annex A. Pages: 43

6th Edition | April 2009 | Product Number: C52606 | Price: $151.00

Std 527
Seat Tightness of Pressure Relief Valves
(ANSI/API Std 527-1992)

Describes methods of determining the seat tightness of metal- and soft-seated pressure relief valves, including those of conventional, bellows, and pilot-operated designs. Pages: 4

3rd Edition | July 1991 | Reaffirmed: July 1, 2007
Product Number: C52700 | Price: $63.00

Std 527 *
Seat Tightness of Pressure Relief Valves—Russian

Russian translation of Standard 527.

3rd Edition | July 1991 | Product Number: C52700R | Price: $66.00

RP 576 ◆■
Inspection of Pressure-relieving Devices

Describes the inspection and repair practices for automatic pressure-relieving devices commonly used in the oil and petrochemical industries. As a guide to the inspection and repair of these devices in the user's plant, it is intended to ensure their proper performance. This publication covers such automatic devices as pressure-relief valves, pilot-operated pressure-relief valves, rupture disks, and weight-loaded pressure-vacuum vents. The scope of this RP includes the inspection and repair of automatic pressure-relieving devices commonly used in the oil and petrochemical industry. This publication does not cover weak seams or sections in tanks, explosion doors, fusible plugs, control valves, and other devices that either depend on an external source of power for operation or are manually operated. Inspections and tests made at manufacturers' plants, which are usually covered by codes or purchase specifications, are not covered by this publication. This publication does not cover training requirements for mechanics involved in the inspection and repair of pressure-relieving devices. Those seeking these requirements should see API 510, which gives the requirements for a quality control system and specifies that the repair organization maintain and document a training program ensuring that personnel are qualified. Pages: 65

3rd Edition | November 2009 | Product Number: C57603 | Price: $130.00

Std 2000 /ISO 28300 ■
Venting Atmospheric and Low-pressure Storage Tanks
Petroleum, petrochemical and natural gas industries—Venting of atmospheric and low-pressure storage tanks

Covers the normal and emergency vapour venting requirements for aboveground liquid petroleum or petroleum products storage tanks and aboveground and underground refrigerated storage tanks, designed for operation at pressures from full vacuum through 103,4 kPa (ga) [15 psig]. Discussed in this standard are the causes of overpressure and vacuum; determination of venting requirements; means of venting; selection, and installation of venting devices; and testing and marking of relief devices.

Intended for tanks containing petroleum and petroleum products but it can also be applied to tanks containing other liquids; however, it is necessary to use sound engineering analysis and judgment whenever this International Standard is applied to other liquids.

This standard does not apply to external floating-roof tanks.

This edition of Std 2000 is the identical national adoption of ISO 28300, *Petroleum, petrochemical and natural gas industries—Venting of atmospheric and low-pressure storage tanks*. Pages: 76

6th Edition | November 2009 | Product Number: CX20006 | Price: $143.00

PRESSURE-RELIEVING SYSTEMS FOR REFINERY SERVICE — TRAINING COURSE

Pressure Relieving Systems based on API RP 520/521
www.api-u.org/pressure_relief.html

API's 3-day course, taught by the Equity Engineering Group, inc. provides real-world case studies about incidents involving pressure relief valves (prv). There also are classroom exercises that illustrate procedures for determining relief rates and valve size.

* These translated versions are provided for the convenience of our customers and are not officially endorsed by API. The translated versions shall neither replace nor supersede the English-language versions, which remain the official Standards. API shall not be responsible for any discrepancies or interpretations of these translations. Translations may not include any Addenda or Errata to the document. Please check the English-language versions for any updates to the documents.

PIPING COMPONENT STANDARDS

RP 574 ■◆
Inspection Practices for Piping System Components

Supplements API 570 by providing piping inspectors with information that can improve skill and increase basic knowledge and practices. This RP describes inspection practices for piping, tubing, valves (other than control valves), and fittings used in petroleum refineries and chemical plants. Common piping components, valve types, pipe joining methods, inspection planning processes, inspection intervals and techniques, and types of records are described to aid the inspector in fulfilling their role implementing API 570. This publication does not cover inspection of specialty items, including instrumentation and control valves. Pages: 88

3rd Edition | November 2009 | Product Number: C57403 | Price: $132.00

Std 598 ■
Valve Inspection and Testing

Covers inspection, examination, supplementary examinations, and pressure test requirements for resilient-seated, nonmetallic-seated (e.g. ceramic), and metal-to-metal-seated valves of the gate, globe, plug, ball, check, and butterfly types. Pages: 11

9th Edition | September 2009 | Product Number: C59809 | Price: $84.00

Std 599 ◆
Metal Plug Valves-Flanged, Threaded and Welding Ends

Covers steel, nickel base and other alloy plug valves with flanged or butt-welding ends and ductile iron plug valves with flanged ends in sizes NPS 1/2 through NPS 24 and threaded or socket-welding ends for sizes NPS 1/2 through NPS 2. Valve bodies conforming to ASME B16.34 may have one flange and one butt-welding end, or one threaded and one socket welding end. Pages: 12

6th Edition | October 2007 | Product Number: C59906 | Price: $78.00

Std 600 ■◆
Steel Gate Valves—Flanged and Butt-welding Ends, Bolted Bonnets

Specifies the requirements for a heavy-duty series of bolted bonnet steel gate valves for petroleum refinery and related applications where corrosion, erosion and other service conditions would indicate a need for full port openings, heavy wall sections and large stem diameters. Pages: 22

12th Edition | March 2009 | Effective Date: September 1, 2009
Product Number: C60012 | Price: $115.00

Std 609 ◆■
Butterfly Valves: Double-flanged, Lug- and Wafer-type

Covers design, materials, face-to-face dimensions, pressure-temperature ratings, and examination, inspection and test requirements for gray iron, ductile iron, bronze, steel, nickel-based alloy, or special alloy butterfly valves that provide tight shutoff in the closed position. The following two categories of butterfly valves are included. Category A—Manufacturer's rated cold working pressure (CWP) butterfly valves, usually with a concentric disc and seat configuration. Sizes covered are NPS 2 to NPS 48 for valves having ASME Class 125 or Class 150 flange bolting patterns. Category B—ASME Class and pressure-temperature rated butterfly valves that have an offset seat and either an eccentric or a concentric disc configuration. These valves may have a seat rating less than the body rating. For lug and wafer, Class 150, 300, and 600, sizes covered are NPS 3 to NPS 24. For double flanged long pattern, Class 150, 300, and 600, sizes covered are NPS 3 to NPS 36. For double flanged short pattern, Class 150 and 300, sizes covered are NPS 3 to NPS 48. For double-flanged short pattern, Class 600, sizes covered are NPS 3 to NPS 24. Pages: 30

7th Edition | October 2009 | Effective Date: March 31, 2010
Product Number: C60907 | Price: $89.00

API 570 ◆■
Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems
(Purchase includes addenda to the current edition of the code.)

API 570 covers the inspection, rating, repair, and alteration procedures for metallic and FRP piping systems and their associated pressure relieving devices that have been in-service. The intent of this code is to specify the in-service inspection and condition-monitoring program that is needed to determine the integrity of piping. That program should provide reasonably accurate and timely assessments to determine if any changes in the condition of piping could possibly compromise continued safe operation. API 570 was developed for the petroleum refining and chemical process industries but may be used, where practical, for any piping system. It is intended for use by organizations that maintain or have access to an authorized inspection agency, a repair organization, and technically qualified piping engineers, inspectors, and examiners. Intended for use by organizations that maintain or have access to an authorized inspection agency, repair organization, and technically qualified personnel. May be used, where practical, for any piping system. Piping inspectors are to be certified as stated in this inspection code. Pages: 65

3rd Edition | November 2009 | Product Number: C57003 | Price: $130.00

RP 578 ◆
Material Verification Program for New and Existing Alloy Piping Systems
(ANSI/API RP 578-1999)

Provides guidelines for a material quality assurance system to verify the consistency between the nominal composition of alloy components within the pressure envelop of a process piping system with the selected or specified construction materials to minimize the potential for catastrophic release of toxic or hazardous liquids or vapors. Presents material control and verification programs on ferrous and nonferrous alloys during construction, installation, maintenance, and inspection of new and existing process piping systems covered under the ASME B31.3 and API 570 codes. Applies to metallic alloy materials purchased for use either by the owner/user or indirectly through vendors, fabricators, or contractors, and includes the supply, fabrication and erection of these materials. Carbon steel components specified in new or existing piping systems are not covered under the scope of this document.

1st Edition | May 1999 | Product Number: C57801 | Price: $118.00

RP 578 ◆
Material Verification Program for New and Existing Alloy Piping Systems—Chinese

The Chinese translation of RP 578.

1st Edition | May 1999 | Product Number: C57801C | Price: $124.00

RP 591
Process Valve Qualification Procedure

Provides recommendations for evaluation of a manufacturer's valve construction and quality assurance program for the purpose of determining a manufacturer's capability to provide new valves manufactured in accordance with the applicable API standards listed in Section 2.

Qualification of valves under this recommended practice is "manufacturing facility specific" and does not cover valves manufactured by other manufacturing facilities, whether owned by the same manufacturer or a third party. Pages: 16

4th Edition | December 2008 | Product Number: C59104 | Price: $86.00

Std 594 ◆
Check Valves: Flanged, Lug, Wafer and Butt-welding

Covers design, materials, face-to-face dimensions, pressure-temperature ratings, and examination, inspection, and test requirements for gray iron, ductile iron, steel, and alloy single and dual plate check valves. Valve configurations include wafer, wafer-lug, and double-flanged type with facings

that will permit installation between ASME and MSS flanges that conform to the standards and specifications listed in the Refinery Service Value Standards. Pages: 11

6th Edition | September 2004 | Product Number: C59406 | Price: $89.00

Std 594 *
Check Valves: Flanged, Lug, Wafer and Butt-welding—Russian

Russian translation of Standard 594.

6th Edition | September 2004 | Product Number: C59406R | Price: $93.00

Std 602 ◆
Steel Gate, Globe, and Check Valves for Sizes DN 100 and Smaller for the Petroleum and Natural Gas Industries

This international standard specifies the requirements for a series of compact steel gate, globe and check valves for petroleum and natural gas industry applications.

It is applicable to valves of:

- nominal pipe sizes NPS 1/4, NPS 3/8, NPS 1/2, NPS 3/4, NPS 1, NPS 1 1/4, NPS 1 1/2, NPS 2, NPS 2 1/2, NPS 3, and NPS 4;
- corresponding to nominal sizes DN 8, DN 10, DN 15, DN 20, DN 25, DN 32, DN 40, DN 50, DN 65, DN 80, and DN 100.

It is also applicable to pressure designations of Class 150, Class 300, Class 600, Class 800 and Class 1500.

Class 800 is not a listed class designation, but is an intermediate class number widely used for socket welding and threaded end compact valves.

It includes provisions for the following valve characteristics.

- Outside screw with rising stems (OS & Y), in sizes 1/4 NPS 4 (8 DN 100) and pressure designations including Class 800.
- Inside screw with rising stems (ISRS), in sizes 1/4 NPS 2 1/2 (8 DN 65) and pressure designations of classes 800.
- Socket welding or threaded ends, in sizes 1/4 NPS 2 1/2 (8 DN 65) and pressure designations of Class 800 and Class 1500.
- Flanged or butt-welding ends, in sizes 1/2 NPS 4 (15 DN 100) and pressure designations of Class 150 through Class 1500, excluding flanged end Class 800.
- Bonnet Joint Construction
- Bolted, welded and threaded with seal weld for classes 1500 and union nut for classes 800.
- Standard and full-bore body seat openings.
- Materials, as specified.
- Testing and inspection.

This publication is applicable to valve end flanges in accordance with ASME B16.5, valve body ends having tapered pipe threads to ASME B1.20.1 or ISO 7-1, valve body ends having socket weld ends to ASME B16.11 and butt-weld connections per the requirements described within this standard. It is applicable to extended body construction in sizes 1/2 NPS 2 (15 DN 50) and pressure designations of Class 800 and Class 1500, and to bellows and bellows assembly construction as may be adaptable to gate or globe valves in sizes 1/4 NPS 2 (8 DN 50). It covers bellows stem seal type testing requirements. Pages: 50

9th Edition | October 2009 | Effective Date: March 31, 2010
Product Number: C60209 | Price: $106.00

Std 603 ◆
Corrosion-Resistant, Bolted Bonnet Gate Valves--Flanged and Butt-Welding Ends

Specifies the requirements for corrosion-resistant bolted bonnet gate valves meeting the requirements of ASME B16.34, Standard Class, for valves having flanged or butt-weld ends in sizes NPS 1/2 through 24, corresponding to nominal pipe sizes in ASME B36.10M, and Classes 150, 300, and 600.

Covers requirements for corrosion resistant gate vales for use in process piping applications. Covered are requirements for outside-screw-and-yoke (OS&Y) valves with rising stems, non-rising hand-wheels, bolted bonnets, and various types of gate configurations. Pages: 12

7th Edition | June 2007 | Product Number: C60307 | Price: $72.00

Std 603 *
Corrosion-Resistant, Bolted Bonnet Gate Valves—Flanged and Butt-Welding Ends—Russian

Russian translation of Standard 603.

7th Edition | June 2007 | Product Number: C60307R | Price: $76.00

Std 607/ISO 10497
Testing of Valves—Fire Type-testing Requirements

Specifies fire type-testing requirements and a fire type-test method for confirming the pressure-containing capability of a valve under pressure during and after the fire test. It does not cover the testing requirements for valve actuators other than manually operated gear boxes or similar mechanisms when these form part of the normal valve assembly. Other types of valve actuators (e.g. electrical, pneumatic or hydraulic) may need special protection to operate in the environment considered in this valve test, and the fire testing of such actuators is outside the scope of this standard.

This edition of Std 607 is the identical national adoption of ISO 10497, *Testing of Valves—Fire Type-testing Requirements*. Pages: 16

5th Edition | June 2005 | Effective Date: June 1, 2005
Product Number: CX60705 | Price: $74.00

Std 607/ISO 10497 *
Testing of Valves—Fire Type-testing Requirements—Russian

Russian translation of Standard 607.

5th Edition | June 2005 | Product Number: CX60705R | Price: $78.00

Std 608 ◆
Metal Ball Valves—Flanged, Threaded and Butt-Welding Ends

Covers metal ball valves used in on-off service that have butt-welding of flanged ends for nominal pipe size NPS 1/2 through NPS 12 and threaded or socket-welding ends for sizes NPS 1/2 through NPS 2, corresponding to the nominal pipe sizes in ASME B36.10M. Also covers additional requirements for ball valves that are otherwise in full conformance to the requirements of ASME B16.34, Standard Class. Pages: 17

4th Edition | December 2008 | Effective Date: June 1, 2009
Product Number: C60804 | Price: $95.00

RP 621
Reconditioning of Metallic Gate, Globe, and Check Valves

Provides guidelines for reconditioning heavy wall (API 600 type) carbon steel, ferritic alloy (up to 9% Cr), stainless steel, and nickel alloy gate, globe, and check valves for ASME pressure classes 150, 300, 400, 600, 900, 1500, and 2500. Guidelines contained in this RP apply to flanged and butt weld cast or forged valves. Pages: 18

2nd Edition | December 2005 | Product Number: C62102 | Price: $123.00

RP 621 *
Reconditioning of Metallic Gate, Globe, and Check Valves-Russian

Russian translation of Recommended Practice 621.

2nd Edition | December 2005 | Product Number: C62102R | Price: $129.00

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Std 622
Type Testing of Process Valve Packing for Fugitive Emissions

Specifies the requirements for comparative testing of block valve stem packing for process applications where fugitive emissions are a consideration. Packing(s) shall be suitable for use at –20 °F to 1000 °F (–29 °C to 538 °C). Factors affecting fugitive emissions performance that are considered by this Standard include temperature, pressure, thermal cycling, mechanical cycling and corrosion. Pages: 23

1st Edition | August 2006 | Product Number: C62201 | Price: $123.00

ELECTRICAL INSTALLATIONS AND EQUIPMENT

RP 500
Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2
(ANSI/API RP 500-1998)

Provides guidelines for determining the degree and extent of Class I, Division 1 and Class I, Division 2 locations at petroleum facilities, for the selection and installation of electrical equipment. Basic definitions provided in the "National Electric Code" have been followed in developing this document which applies to the classification of locations for both temporarily and permanently installed electrical equipment. RP 500 is intended to be applied where there may be a risk of ignition due to the presence of flammable gas or vapor, mixed with air under normal atmospheric conditions. Pages: 121

2nd Edition | November 1997 | Reaffirmed: November 1, 2002
Product Number: C50002 | Price: $197.00

RP 505
Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1 and Zone 2
(ANSI/API RP 505-1998)

Provides guidelines for determining the degree and extent of Class I, Zone 0, Zone 1, and Zone 2 locations at petroleum facilities, for the selection and installation of electrical equipment. Basic definitions provided in the National Electrical Code have been followed in developing this document which applies to the classification of locations for both temporarily and permanently installed in electrical equipment. RP 505 is intended to be applied where there may be a risk of ignition due to the presence of flammable gas or vapor, mixed with air under normal atmospheric conditions. Pages: 131

1st Edition | November 1997 | Reaffirmed: November 1, 2002
Product Number: C50501 | Price: $197.00

RP 540
Electrical Installations in Petroleum Processing Plants

Provides information on electrical installations in petroleum processing plants. It is intended for all individuals and organizations concerned with the safe design, installation and operation of electrical facilities in petroleum processing plants. Pages: 107

4th Edition | April 1999 | Reaffirmed: July 1, 2004
Product Number: C54004 | Price: $182.00

Std 541
Form-Wound Squirrel-Cage Induction Motors 500 Horsepower and Larger

Covers the minimum requirements for all form-wound squirrel-cage induction motors 500 Horsepower and larger for use in petroleum industry services. This standard may be applied to adjustable speed motors and induction generators with appropriate attention to the specific requirements of such applications Pages: 84

4th Edition | June 2004 | Product Number: C54104 | Price: $166.00

RP 545 ■
Lighting Protection for Aboveground Storage Tanks

RP 545 replaces the requirements of API 2003 regarding lightning protection for preventing fires in storage tanks with flammable or combustible contents. This recommended practice (RP) provides guidance and information to assist owners/operators with lightning protection for tanks. This RP does not provide complete protection for all possible lightning stroke occurrences. Pages: 12

1st Edition | October 2009 | Product Number: C54501 | Price: $98.00

Std 546
Brushless Synchronous Machines-500 kVA and Larger

Covers the minimum requirements for form-wound and bar-wound brushless synchronous machines in petroleum related industry service. The standard has been updated to include both synchronous motors and generators with two different rotor designs: (1) the conventional salient-pole rotor with solid or laminated poles, and (2) the cylindrical rotor with solid or laminated construction. Also included are new datasheet guides to help clarify the datasheet requirements. Pages: 108

2nd Edition | June 1997 | Product Number: C54602 | Price: $166.00

Std 547 ◆
General-purpose Form-wound Squirrel Cage Induction Motors-250 Horsepower and Larger

Covers the requirements for form-wound induction motors for use in general-purpose petroleum, chemical and other industrial severe duty applications. These motors:

- are rated 250 hp (185 kW) through 3000 hp (2250 kW) for 4, 6 and 8 pole speeds,
- are rated less than 800 hp (600 kW) for two-pole (3000 or 3600 RPM) motors of totally-enclosed construction,
- are rated less than 1250 hp (930 kW) for two-pole motors of WP-II type enclosures,
- drive centrifugal loads,
- drive loads having inertia values within those listed in NEMA MG 1 Part 20),
- are not induction generators. Pages: 30

1st Edition | January 2005 | Product Number: C54701 | Price: $91.00

HEAT TRANSFER EQUIPMENT STANDARDS FOR REFINERY SERVICE

Std 530/ISO 13704:2007
Calculation of Heater-tube Thickness in Petroleum Refineries
Petroleum and natural gas industries—Calculation of heater-tube thickness in petroleum refineries

Specifies the requirements and gives recommendations for the procedures and design criteria used for calculating the required wall thickness of new tubes for petroleum refinery heaters. These procedures are appropriate for designing tubes for service in both corrosive and non-corrosive applications. These procedures have been developed specifically for the design of refinery and related process fired heater tubes (direct-fired, heat-absorbing tubes within enclosures). These procedures are not intended to be used for the design of external piping.

This edition of API Std 530 is the identical national adoption of ISO 13704, *Petroleum and natural gas industries—Calculation of heater-tube thickness in petroleum refineries.* Pages: 146

6th Edition | September 2008 | Effective Date: September 16, 2008
Product Number: C53006 | Price: $256.00

RP 531M
Measurement of Noise from Fired Process Heaters (Metric Only)

Provides a test procedure for near-field noise measurement and analytical methods for computational analysis of the total sound-power level of a direct-fired heater and associated equipment in petroleum processing plants. Pages: 33

1st Edition | March 1980 | Effective Date: March 1, 1980
Reaffirmed: August 1, 1995 | Product Number: C53100 | Price: $63.00

Publ 534
Heat Recovery Steam Generators

Provides guidelines for the selection or evaluation of heat recovery steam generator (HRSG) systems. Details of related equipment designs are considered only where they interact with the HRSG system design. The document does not provide rules for design, but indicates areas that need attention and offers information and descriptions of HRSG types available to the designer/user for purposes of selecting the appropriate HRSG. Pages: 60

2nd Edition | February 2007 | Effective Date: February 7, 2007
Product Number: C53402 | Price: $92.00

Publ 535
Burners for Fired Heaters in General Refinery Services

Provides guidelines for the selection and/or evaluation of burners installed in fired heaters in general refinery services. Details of fired heater and related equipment designs are considered only where they interact with the burner selection. This recommended practice does not provide rules for design but indicates areas that need attention. It offers information and descriptions of burner types available to the designer/user for purposes of selecting the appropriate burner for a given application. The burner types discussed are those currently in industry use. It is not intended to imply that other burner types are not available or recommended. Many of the individual features described in these guidelines will be applicable to most burner types. Pages: 76

2nd Edition | January 2006 | Effective Date: January 1, 2006
Product Number: C53502 | Price: $113.00

RP 536
Post Combustion NOx Control for Equipment in General Refinery Services

Covers the mechanical description, operation, maintenance, and test procedures of postcombustion NOx control equipment. It does not cover reduced NOx formation through burner design techniques such as external flue gas recirculation (FGR). Pages: 41

2nd Edition | December 2006 | Effective Date: December 8, 2006
Product Number: C53602 | Price: $94.00

Std 537/ISO 25457:2008 ■
Flare Details for General Refinery and Petrochemical Service
Petroleum petrochemical and natural gas industries—Flares details for general refinery and petrochemical service

Applicable to flares used in pressure relieving and vapor-depressuring systems used in general refinery and petrochemical services. The information provided is intended to aid in the design and selection of a flare system that is most appropriate for the risks and circumstances. Although this Standard is primarily intended for new flares and facilities, it may be used as a guideline in the evaluation of existing facilities together with appropriate cost and risk assessment considerations.

This edition of API Std 537 is the identical national adoption of ISO 25457, *Petroleum, petrochemical and natural gas industries—Flare details for general refinery and petrochemical service*. Pages: 156

2nd Edition | January 2009 | Product Number: CX53702 | Price: $210.00

Std 560/ISO 13705:2006
Fired Heaters for General Refinery Services
Petroleum and natural gas industries—Fired heaters for general refinery service

Specifies requirements and gives recommendations for the design, materials, fabrication, inspection, testing, preparation for shipment, and erection of fired heaters, air preheaters, fans and burners for general refinery service. This Standard is not intended to apply to the design of steam reformers or pyrolysis furnace.

This edition of API 560 is an identical national adoption of ISO 13705, *Petroleum and natural gas industries—Fired heaters for general refinery service.* Pages: 266

4th Edition | August 2007 | Effective Date: August 30, 2007
Product Number: C56004 | Price: $293.00

RP 573
Inspection of Fired Boilers and Heaters

Covers the inspection practices for fired boilers and process heaters (furnaces) used in petroleum refineries and petrochemical plants. The practices described in this document are focused to improve equipment reliability and plant safety by describing the operating variables which impact reliability, and to ensure that inspection practices obtain the appropriate data, both on-stream and off-stream, to assess current and future performance of the equipment. Pages: 69

2nd Edition | December 2002 | Effective Date: December 1, 2002
Product Number: C57302 | Price: $94.00

Std 660/ISO 16812:2007
Shell-and-tube Heat Exchangers
Petroleum and natural gas industries—Shell-and-tube heat exchangers

Specifies requirements and gives recommendations for the mechanical design, material selection, fabrication, inspection, testing and preparation for shipment of shell-and-tube heat exchangers for the petroleum, petrochemical and natural gas industries. This International Standard is applicable to the following types of shell-and-tube heat exchangers: heaters, condensers, coolers and reboilers.

This edition of API Std 660 is the identical national adoption of ISO 16812:2007, *Petroleum and natural gas industries—Shell-and-tube heat exchangers*. Pages: 41

8th Edition | August 2007 | Product Number: CX66008 | Price: $160.00

Std 661/ISO 13706:2005
Air-Cooled Heat Exchangers for General Refinery Service
Petroleum and natural gas industries—Air-cooled heat exchangers

Provides a purchase specification for purchasers and vendors of air-cooled heat exchangers for use in refinery service. It requires the purchaser to specify certain details and features covering the minimum requirements for design, materials, fabrication, inspection, testing, and preparing for shipment of refinery process air-cooled heat exchangers. These requirements are specifically for the forced- or induced-draft type of heat exchangers.

This edition of Std 661 is an identical national adoption of ISO 13706, *Petroleum and natural gas industries—Air-cooled heat exchangers.* Pages: 115

6th Edition | February 2006 | Effective Date: February 1, 2006
Product Number: CX66106 | Price: $235.00

Std 662, Part 1/ISO 15547-1:2005
Plate Heat Exchangers for General Refinery Services, Part 1—Plate-and-Frame Heat

Exchangers Petroleum petrochemical and natural gas industries—Plate heat exchangers—Part 1: Plate-and-frame heat exchangers

Gives requirements and recommendations for the mechanical design, materials selection, fabrication, inspection, testing, and preparation for shipment of plate-and-frame heat exchangers for use in petroleum, petrochemical and natural gas industries. It is applicable to gasketed, semi-welded and welded plate-and frame heat exchangers.

This edition of 662-1 is an identical national adoption of ISO 15547-1, *Exchangers Petroleum petrochemical and natural gas industries—Plate heat exchangers—Part 1: Plate-and-frame heat exchangers*. Pages: 34

1st Edition | February 2006 | Effective Date: February 27, 2006
Product Number: CX662101| Price: $128.00

Std 662, Part 2/ISO 15547-2:2005
Plate Heat Exchangers for General Refinery Services, Part 2—Brazed Aluminum Plate-fin Heat

Exchangers Petroleum and natural gas industries—Plate heat exchangers—Part 2: Brazed aluminum plate-fin heat exchangers

Gives requirements and recommendations for the mechanical design, materials selection, fabrication, inspection, testing, and preparation for shipment of brazed aluminum plate-fin heat exchangers for use in petroleum, petrochemical and natural gas industries.

This edition of 662-2 is an identical national adoption of ISO 15547-2, *Exchangers Petroleum and natural gas industries—Plate heat exchangers—Part 2: Brazed aluminum plate-fin heat exchangers*. Pages: 34

1st Edition | February 2006 | Effective Date: February 27, 2006
Product Number: CX662201 | Price: $128.00

INSTRUMENTATION AND CONTROL MANUALS

RP 551
Process Measurement Instrumentation

Provides procedures for the installation of the more generally used measuring and control instruments and related accessories. Pages: 58

1st Edition | May 1993 | Effective Date: May 1, 1993
Reaffirmed: February 20, 2007 | Product Number: C55100 | Price: $121.00

RP 552
Transmission Systems

Reviews the recommended practices for the installation of electronic and pneumatic measurement and control-signal transmission systems. Transmission systems permit operation of one or more large or small process units from a remote control center. Pages: 39

1st Edition | October 1994 | Reaffirmed: February 20, 2007
Product Number: C55201 | Price: $105.00

RP 553
Refinery Control Valves

Provides recommended criteria for the selection, specification and application of piston and diaphragm actuated control valves. It also outlines control valve design considerations, discusses control valve sizing, noise, fugitive emissions, and defines types of commonly used control valves and their actuators. Pages: 26

1st Edition | September 1998 | Reaffirmed: February 20, 2007
Product Number: C55301 | Price: $94.00

RP 554, Part 1
Process Control Systems, Part 1—Process Control Systems Functions and Functional Specification Development

Covers performance requirements and considerations for the section, specification, installation and testing of process instrumentation and control systems. Control centers as used in the petroleum industry are also covered. This practice is not intended to be used as a purchase specification, but makes recommendations from minimum requirements and can be used to provide guidance for the development of detailed designs and specifications. Pages: 32

2nd Edition | July 2007 | Effective Date: July 1, 2007
Product Number: C55402 | Price: $134.00

RP 554, Part 2
Process Control Systems-Process Control System Design

Addresses the processes required to successfully implement Process Control Systems for Refinery and Petrochemical Services. The major topic addressed in Part 2 is, practices to select and design the installation for hardware and software required to meet the functional and integration requirements. Pages: 65

1st Edition | October 2008 | Effective Date: October 15, 2008
Product Number: C554201 | Price: $134.00

RP 554, Part 3
Process Control Systems-Project Execution and Process Control System Ownership

Addresses the processes required to successfully implement Process Control Systems for Refinery and Petrochemical Services. The major topic addressed in Part 3 is project organization, skills and management required to execute a Process Control project and then to own and operate a Process Control Systems. Pages: 40

1st Edition | October 2008 | Effective Date: October 15, 2008
Product Number: C554301 | Price: $103.00

API 555
Process Analyzers

(ANSI/API 555-2001)

Addresses the considerations in the application of analyzers and associated systems, installation, and maintenance. Process monitors that measure and transmit information about chemical composition, physical properties, or chemical properties are known as process analyzer systems. Process analyzers are now used widely in the refining industry for (a) monitoring and controlling product quality, (b) implementing advanced control strategies in improving process operations, (c) enhancing area safety, and (d) continuous emission monitoring and environmental measurement of air and water quality. Pages: 225

2nd Edition | November 2001 | Reaffirmed: February 20, 2007
Product Number: C55502 | Price: $141.00

RP 556
Fired Heaters & Steam Generators

Written to aid in the installation of the more generally used measuring, control, and analytical instruments; transmission systems; and related accessories to achieve safe, continuous, accurate and efficient operation with minimum maintenance. Although the information has been prepared primarily for petroleum refineries, much of it is applicable without change in chemical plants, gasoline plants, and similar installations. Pages: 40

1st Edition | May 1997 | Product Number: C55601 | Price: $111.00

■ This publication is a new entry in this catalog. ◆ This publication is related to an API licensing, certification, or accreditation program.

RP 557
Guide to Advanced Control Systems

Addresses the implementation and ownership of advanced control systems for refinery purposes. The document also described commonly used practices for the opportunity identification, justification, project management, implementation and maintenance of advanced control system applications in refinery service. Pages: 28

1st Edition | December 2000 | Reaffirmed: February 20, 2007
Product Number: C55701 | Price: $94.00

TECHNICAL DATA BOOK PETROLEUM REFINING

Electronic Version of the API Technical Data Book

Improve the overall design and operations in today's highly complex petroleum refinery process systems with the API Technical Database. Version 1.0 of the API Technical Database replaces the printed format of the popular API Tech Data Books with a modern Windows interface that is so unique it is patented. This single screen approach provides access to the latest API physical property estimation methods and the software is critically reviewed and approved by the API Technical Data Committee. Included is a database of property data for nearly 900 components, characterization of petroleum fractions, and petroleum fraction distillation interconversions. Users can quickly determine petroleum fraction physical property data such as critical properties, vapor pressure, density, liquid enthalpy, gas enthalpy, heat of vaporization, liquid heat capacity, gas heat capacity, surface tension, liquid viscosity, gas viscosity, liquid thermal conductivity, gas thermal conductivity, and heat of combustion. Temperature-dependant properties can be tabulated and graphed over any range, and distillation interconversions are displayed graphically. This data can then be exported for use in simulation and engineering software programs.

Contact EPCON International at 281-389-9400 or visit the EPCON website at: www.epcon.com

TECHNICAL DATA BOOK PETROLEUM REFINING RELATED ITEMS

TR 997
Comprehensive Report of API Crude Oil Characterization Measurements

A consortium of API member companies has sponsored a research program consisting of a series of projects on the characterization of crude oils. The goal of this program was to obtain complete sets of assay and thermophysical property data on a few widely varying crude oil refining and refining facilities. This report provides descriptions of the test procedures, discussions of their accuracy, and comprehensive compilation of the data for the crude oils measured under this program. Pages: 129

1st Edition | August 2000 | Product Number: C99701 | Price: $204.00

Reports issued by Research Project 49
1951

API Research Project 49, Reference Clay Minerals, issued a series of eight reports, as follows:

No. 1, Glossary of Mineral Names

No. 2, Reference Clay Localities-United States

No. 3, Differential Thermal Analysis of Reference Clay Mineral Specimens

No. 4, Reference Clay-Europe

No. 5, Occurrence and Microscopic Examination of Reference Clay Mineral Specimens

No. 6, Electron Micrographs of Reference Clay Minerals

No. 7, Analytical Data on Reference Clay Minerals

No. 8, Infrared Spectra of Clay Minerals

CHARACTERIZATION AND THERMODYNAMICS

Thermodynamic Properties and Characterization of Petroleum Fractions
February 1988

API Monograph Series

Each publication discusses the properties of solid, liquid, and gaseous phases of one or a few closely related, industrially important compounds in a compact, convenient, and systematic form. In addition to the basic physical properties, each publication covers density, molar volume, vapor pressure, enthalpy of vaporization, surface tension, thermodynamic properties, viscosity, thermal conductivity, references to properties of mixtures, and spectrographic data.

Publ 705, Tetralin, 1978

Publ 706, cis- and trans-Decalin, 1978

Publ 707, Naphthalene, 1978

Publ 708, Anthacene and Phenanthrene 9, 1979

Publ 709, Four-Ring Condensed Aromatic Compounds, 1979

Publ 710, Pyridine and Phenylpyridines, 1979

Publ 711, Quinoline, 1979

Publ 712, Isoquinoline, 1979

Publ 713, Indanols, 1980

Publ 714, Indan and Indene, 1980

Publ 715, Acenaphthylene, Acenaphthene, Fluorene, and Fluoranthene, 1981

Publ 716, Carbazole, 9-Methylcarbazole, and Acridine, 1981

Publ 717, Thiphene, 2,3- and 2,5-Dihydrothiophene, and Tetrahydrothiophene, 1981

Publ 718, Aniline, 1982

Publ 719, Indole, 1982

Publ 720, 2-, 3-, and 4-Methylaniline, 1983

Publ 721, Benzofuran, Dibenzofuran, and Benzonaphthofurans, 1983

Publ 722, Isopropylbenzene, and 1-Methyl-2-, -3-, and -4-Isopropylbenzene, 1984

Publ 723, tert-Butyl methyl ether, 1984

Publ 724, 1- and 2-Methylnaphthalene and Dibenzanthracenes, 1985

TR 934-C
Materials and Fabrication of 1-$^1/_4$CR - $^1/_2$Mo Steel Heavy Wall Pressure Vessels for High Pressure Hydrogen Service Operating at or Below 825 °F (441 °C)

1st Edition | May 2008 | Product Number: C934C01 | Price: $103.00

MATERIALS ENGINEERING PUBLICATIONS

RP 571 ◆
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry

Provides background information on damage that can occur to equipment in the refining process. It is intended to supplement Risk Based Inspection (RP 580 and Publ 581) and Fitness-for-Service (RP 579) technologies developed in recent years by API to manage existing refining equipment integrity. It is also an excellent reference for inspection, operations, and maintenance personnel. Covers over 60 damage mechanism. Each write-up consists of a general description of the damage, susceptible materials, of construction, critical factors, inspection method selection guidelines, and control measures. Wherever possible, pictures are included and references are provided for each mechanism. In addition, generic process flow diagrams have been included that contain a summary of the major damage flow mechanism expected for typical refinery process units. Pages: 257

1st Edition | December 2003 | Product Number: C57101 | Price: $227.00

RP 571 ◆
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Chinese

Chinese translation of RP 571.

1st Edition | December 2003 | Product Number: C57101C | Price: $238.00

RP 571 *
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry —German

The German translation of RP 571.

1st Edition | December 2003 | Product Number: C57101G | Price: $238.00

RP 582 ■
Recommended Practice Welding Guidelines for the Chemical, Oil, and Gas Industries

Provides supplementary guidelines and practices for welding and welding related topics for shop and field fabrication, repair and modification of the following:

- pressure-containing equipment such as pressure vessels, heat exchangers, piping, heater tubes, and pressure boundaries of rotating equipment and attachments welded thereto;
- tanks and attachments welded thereto;
- nonremovable internals for process equipment;
- structural items attached and related to process equipment;
- other equipment or component item when referenced by an applicable purchase document.

This document is general in nature and is intended to augment the welding requirements of ASME BPVC Section IX and similar codes, standards, specifications and practices such as those listed in Section 2. The intent of this document is to be inclusive of chemical, oil and gas industry standards, although there are many areas not covered herein, e.g. pipeline welding and offshore structural welding are intentionally not covered.

This document is based on industry experience and any restrictions or limitations may be waived or augmented by the purchaser. Pages: 28

2nd Edition | December 2009 | Product Number: C58202 | Price: $120.00

TR 932-A
The Study of Corrosion in Hydroprocess Reactor Effluent Air Cooler Systems

Provides technical background for controlling corrosion in hydroprocesses reactor effluent systems based on Industry experience and consensus practice. Information for this report has been gathered from open literature, private company reports, and interviews with representatives of major refining companies. The findings in this report are the basis for the guidance in Bulletin 932-B.

September 2002 | Product Number: C932A0 | Price: $146.00

Publ 932-B
Design, Materials, Fabrication, Operation, and Inspection Guidelines for Corrosion Control in Hydroprocessing Reactor Effluent Air Cooler (REAC) Systems

Provides guidance to engineering and plant personnel on equipment and piping design, material selection, fabrication, operation, and inspection practices to manage corrosion and fouling in the wet sections of hydroprocessing reactor effluent systems. RP 932-B is applicable to process streams in which NH4Cl and NH4HS salts can form and deposit in equipment and piping, or dissolve in water to form aqueous solutions of these salts. An understanding of the variables impacting corrosion and fouling in these systems is necessary to improve the reliability, safety, and environmental impact associated with them. Within the refining industry, continuing equipment replacements, unplanned outages, and catastrophic incidents illustrate the current need to better understand the corrosion characteristics and provide guidance on all factors that can impact fouling and corrosion in REAC systems.

1st Edition | June 2004 | Product Number: C932B1 | Price: $166.00

RP 934-A
Materials and Fabrication of 2 1/4Cr-1Mo, 2 1/4Cr-1Mo-1/4V, 3Cr-1Mo, and 3Cr-1Mo-1/4V Steel Heavy Wall Pressure Vessels for High-temperature, High-pressure Hydrogen Service

Applies to new heavy wall pressure vessels in petroleum refining, petrochemical and chemical facilities in which hydrogen or hydrogen-containing fluids are processed at elevated temperature and pressure. It is based on decades of industry operating experience and the results of experimentation and testing conducted by independent manufactures, fabricators and users of heavy wall pressure vessels for this service. Pages: 19

2nd Edition | May 2008 | Product Number: C934A02 | Price: $103.00

TR 935
Thermal Conductivity Measurement Study of Refractory Castables

Compares the differences between measurement techniques used to develop thermal conductivity of refractory castables. The following procedures were examined: Water Calorimeter, Calorimeter-Pilkington Method, Hot Wire Method, Comparative Thermal Conductivity Method, and Panel Test. The refractory industry uses various methods for measuring and reporting thermal conductivity. The accuracy of reporting and understanding thermal conductivity are vital to developing the most cost effective, efficient, and reliable equipment. The study makes no attempt to rank, classify or assign accuracy to each of the measurement techniques. Pages: 22

1st Edition | September 1999 | Product Number: C93501 | Price: $58.00

Std 936 ◆
Refractory Installation Quality Control Specification—Inspection & Testing Monolithic Refractory Linings & Materials

Provides installation quality control procedures for monolithic refractory linings and may be used to supplement owner specifications. Materials, equipment, and personnel are qualified by the methods described, and applied refractory quality is closely monitored based on defined procedures and acceptance criteria. The responsibilities of inspection personnel who monitor and direct the quality control process are also defined.

3rd Edition | November 2008 | Product Number: C93603 | Price: $129.00

Publ 937-A
Study to Establish Relations for the Relative Strength of API 650 Cone Roof, Roof-to-Shell and Shell-to-Bottom Joints

The purpose of this study is to investigate the relative strengths of the roof-to-shell and shell-to-bottom joints, with the goal of providing suggestions for frangible roof design criteria applicable to smaller tanks. Pages: 68

1st Edition | August 2005 | Product Number: C937A0 | Price: $118.00

TR 938-A
An Experimental Study of Causes and Repair of Cracking of 1 1/4Cr-1/2Mo Steel Equipment

Gives the results of an experimental study conducted to provide the petroleum industry with solutions to recurring incidents of cracking in the application of welded 1 1/4 Cr-1/2 Mo steel for hydrogen processing equipment. Pages: 220

1st Edition | May 1996 | Product Number: C93801 | Price: $159.00

* These translated versions are provided for the convenience of our customers and are not officially endorsed by API. The translated versions shall neither replace nor supersede the English-language versions, which remain the official Standards. API shall not be responsible for any discrepancies or interpretations of these translations. Translations may not include any Addenda or Errata to the document. Please check the English-language versions for any updates to the documents.

Publ 938-B
Use of 9Cr-1Mo-V (Grade 91) Steel in the Oil Refining Industry

Provides guidelines on the proper specifications for base metal and welding consumables and successful fabrication, including welding and heat treatment requirements for use of 9Cr-1Mo-V alloy steel in the oil refinery services. This includes guidelines for preheat, postweld heat treatment, procedure qualification, and mechanical and nondestructive testing. It covers the basic material and metallurgical properties of 9Cr-1Mo-V steel, including a summary of the physical and mechanical properties, corrosion and oxidation resistance, indicating possible corrosion and/or mechanical failure mechanisms and how to avoid them. The appropriate base metal heat treatment is also given. This document also defines hardness limits for the base material and welds in order to avoid cracking failures due to wet sulfide stress corrosion cracking or due to other possible failure mechanisms. A discussion of both proper and improper refinery service applications for these steels is also provided Pages: 40

1st Edition | June 2008 | Product Number: C938B01 | Price: $105.00

TR 938-C
Use of Duplex Stainless Steels in the Oil Refining Industry

The economical combination of strength and corrosion resistance of duplex stainless steels (DSS) has enabled their increasing use in the refining industry. DSS most commonly used today are classified under new grades and have led to improved welding practices. Covers potential environmental-related failure mechanisms and preventative measures to avoid them; typical material and fabrication specification requirements used by refiners; and examples of applications of DSS within refineries. The report also lists the chemistries and UNS numbers of various common DSS, including some first generation DSS for comparison. Pages: 36

1st Edition | May 2005 | Product Number: C938C1 | Price: $105.00

TR 939-A
Research Report on Characterization and Monitoring of Cracking in Wet H_2S Service

Demonstrates the ability to characterize and monitor various aspects of crack propagation in pressurized process equipment exposed to wet hydrogen sulfide environments. It represents one of several significant industry-wide efforts to study and to better understand this phenomenon. Pages: 136

1st Edition | October 1994 | Product Number: C93901 | Price: $151.00

TR 939-B
Repair and Remediation Strategies for Equipment Operating in Wet H_2S Service

Presents data relative to the fabrication requirements for 2-$^1/_4$ 3Cr alloy steel heavy wall pressure vessels for high temperature, high pressure hydrogen services. It summarizes the results of industry experience, experimentation, and testing conducted by independent manufacturers, fabricators, and users of heavy wall pressure vessels. This recommended practice applies to equipment in refineries, petrochemical, and chemical facilities in which hydrogen or hydrogen containing fluids are processed at elevated temperature and pressure. Pages: 236

1st Edition | June 2002 | Product Number: C939B0 | Price: $166.00

RP 939-C ■
Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries

Applicable to hydrocarbon process streams containing sulfur compounds, with and without the presence of hydrogen, which operate at temperatures above approximately 450 °F (230 °C) up to about 1000 °F (540 °C). A threshold limit for sulfur content is not provided because within the past decade significant corrosion has occurred in the reboiler/fractionator sections of some hydroprocessing units at sulfur or H^2S levels as low as 1 ppm. Nickel base alloy corrosion is excluded from the scope of this document. While sulfidation can be a problem in some sulfur recovery units, sulfur plant combustion sections and external corrosion of heater tubes due to firing sulfur containing fuels in heaters are specifically excluded from the scope of this document. Pages: 35

1st Edition | May 2009 | Product Number: C939C01 | Price: $110.00

TR 939-D
Stress Corrosion Cracking of Carbon Steel in Fuel Grade Ethanol—Review, Experience Survey, Field Monitoring, and Laboratory Testing

Addresses stress corrosion cracking (SCC) in carbon steel equipment used in distribution, transportation, storage, and blending of denatured fuel ethanol. API, with assistance from the Renewable Fuels Association (RFA), conducted research on the potential for metal cracking and product leakage in certain portions of the fuel ethanol distribution system. TR 939-D contains a review of existing literature, results of an industry survey on cracking events and corrosion field monitoring, information on mitigation and prevention Pages: 172

2nd Edition | May 2007 | Product Number: C939D0 | Price: $155.00

Bull 939-E
Identification, Repair, and Mitigation of Cracking of Steel Equipment in Fuel Ethanol Service

Usage of fuel ethanol as an oxygenate additive in gasoline blends is increasing both in the United States and internationally. This document discusses stress corrosion cracking (SCC) of carbon steel tanks, piping and equipment exposed to fuel ethanol as a consequence of being in the distribution system, at ethanol distribution facilities, or end user facilities where the fuel ethanol is eventually added to gasoline. Such equipment includes but is not limited to:

- storage tanks,
- piping and related handling equipment, and
- pipelines that are used in distribution, handling, storage and blending of fuel ethanol.

However, data for pipelines in ethanol service is limited and caution should be used when applying guidelines from this document which have been derived mainly from applications involving piping and tanks in ethanol storage and blending facilities. SCC of other metals and alloys is beyond the scope of this document as is the corrosion of steel in this service. Pages: 37

1st Edition | November 2008 | Product Number: C939E01 | Price: $136.00

RP 941
Steels for Hydrogen Service at Elevated Temperatures and Pressures in Petroleum Refineries and Petrochemical Plants

Summarizes the results of experimental tests and actual data acquired from operating plants to establish practical operating limits for carbon and low alloy steels in hydrogen service at elevated temperatures and pressures. The effects on the resistance of steels to hydrogen at elevated temperature and pressure that result from high stress, heat treating, chemical composition, and cladding are discussed. This RP does not address the resistance of steels to hydrogen at lower temperatures [below about 400 °F (204 °C)], where atomic hydrogen enters the steel as a result of an electrochemical mechanism. This RP applies to equipment in refineries, petrochemical facilities, and chemical facilities in which hydrogen or hydrogencontaining fluids are processed at elevated temperature and pressure. The guidelines in this RP can also be applied to hydrogenation plants such as those that manufacture ammonia, methanol, edible oils, and higher alcohols. Pages: 32

7th Edition | August 2008 | Product Number: C94107 | Price: $121.00

TR 941
The Technical Basis Document for API RP 941

Even before the first edition of API Publication 941, *Steels for Hydrogen Service at Elevated Temperatures and Pressures in Petroleum Refineries and Petrochemical Plants* appeared in 1970, there had been fundamental questions regarding the technical basis for the materials performance curves contained in the document (1-6). Based upon sparse laboratory data combined with plant experience, with only a few exceptions, the curves have

done an exceptionally good job at safely directing the refining industry in selecting materials based upon operating temperature, hydrogen partial pressure, and the metallurgy of the equipment being considered.

1st Edition | September 2008 | Product Number: C09410 | Price: $192.00

RP 945
Avoiding Environmental Cracking in Amine Units

Discusses environmental cracking problems of carbon steel equipment in amine units. This publication provides guidelines for carbon steel construction materials, including, fabrication, inspection, and repair, to help assure safe and reliable operation. The steels referred to in this document are defined by the ASTM designation system, or equivalent materials contained in other recognized codes or standards. This document is based on current engineering practices and insights from recent industry experience. Pages: 25

3rd Edition | June 2003 | Reaffirmed: November 5, 2008
Product Number: C94503 | Price: $98.00

Publ 946
The Effect of Outgassing Cycles on the Hydrogen Content in Petrochemical Reactor-Vessel Steels

1st Edition | January 1981 | Product Number: D90600

TR 950
Survey of construction Materials and corrosion in Sour Water Strippers—1978

1st Edition | January 1983

Publ 959
Characterization Study of Temper Embrittlement of Chromium-Molybdenum Steels

1st Edition | January 1982 | Product Number: C95900 | Price: $152.00

API Coke Drum Survey 1996
Final Report

In 1996 a survey was sent by the API Subcommittee on Inspection; Coke Drum Task Group, to companies operating coke drums in the United States and abroad. This was the third survey of similar nature conducted by API. Fifty-four surveys were returned representing 17 operating companies and a total of 145 drums. The purpose of the survey was to collect data covering a broad range of issues including: 1. General Information 2. Design 3. Operating Information 4. Inspection Practices 5. Deterioration Experience 6. Repair Procedures Three of the six areas, Operation Information, Inspection Practices and Deterioration Experience were not covered in previous industry surveys. Additionally, this survey requested more detailed information than previous surveys. Pages: 61

October 2003 | Product Number: C096C1 | Price: $119.00

Impact of Gasoline Blended with Ethanol on the Long-Term Structural Integrity of Liquid Petroleum Storage Systems and Components

Summarizes the results of a literature review conducted for the American Petroleum Institute on the impact of gasoline blended with ethanol on the long-term structural integrity of liquid petroleum storage systems and components. It is anticipated that the use of ethanol in motor fuels will continue to increase. This has generated interest about the potential long-term structural effects of ethanol on liquid petroleum storage systems, including underground storage tanks (USTs), underground piping, and associated components. The objective of the literature review is to determine the state of industry knowledge and research on the effects of ethanol / gasoline blends on the long-term structural integrity of UST systems and components. This review is intended to assist decision-makers on further research requirements and needed changes or supplements to existing standards for underground storage system components used for storing and dispensing gasoline blended with ethanol.

Appendix A may be purchased separately as an electronic database file. The database synopsis' and bibliographic information for all articles reviewed for the project. The report is organized by article index numbers. Reference numbers cited in this report refer to the article index number.

January 2003 | Executive Summary | Price: $63.00
Appendix A—Literature Review | Price $123.00

PETROLEUM PRODUCTS AND PETROLEUM PRODUCT SURVEYS

Publ 4261
Alcohols and Ethers: A Technical Assessment of Their Application as Fuels and Fuel Components

Summarizes information from the technical literature on producing and applying alcohols and ethers as fuels and fuel components for the transportation sector. It assesses the technical advantages and disadvantages of alcohols and ethers with respect to hydrocarbon fuels. Since the amendment of the Clean Air Act in 1977, and subsequently in 1990, public interest in the role of oxygenates in transportation has significantly increased. This edition of API Publication 4261 has been updated and expanded to include a review of the oxygenate regulations and the technical literature that has been published since 1988. It provides a technical assessment suitable for policy discussions related to alcohols and ethers in transportation. Pages: 119

3rd Edition | June 2001 | Product Number: C42613 | Price: $157.00

Publ 4262
Methanol Vehicle Emissions

December 1990 | Product Number: F42620 | Price: $121.00

API/NPRA Survey
Final Report: 1996 API/NPRA Survey of Refining Operations and Product Quality

A survey of industry refining data for the period May 1 through August 31, 1996. The report includes information on domestically produced gasoline and diesel product quality as well as aggregate domestic refining capacity and average operating data. Pages: 190

1st Edition | July 1997 | Product Number: F10001 | Price: $63.00

Aviation Turbines Fuels, 2001 | Price: $90.00

Heating Oils, 2002 | Price: $100.00

Motor Gasolines, Winter 2001–2002 | Price: $120.00

Motor Gasolines, Summer 2001 | Price: $120.00

Diesel Fuel Oils, 2002 | Price: $100.00

Magnetic computer tapes of raw data are available upon request. Reports from previous years are also available.

Order these petroleum product surveys from:
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PROCESS SAFETY STANDARDS

RP 752 ■
Management of Hazards Associated with Location of Process Plant Buildings

Provides guidance for managing the risk from explosions, fires and toxic material releases to on-site personnel located in new and existing buildings intended for occupancy. This RP was developed for use at refineries, petrochemical and chemical operations, natural gas liquids extraction plants, natural gas liquefaction plants, and other onshore facilities covered by the OSHA Process Safety Management of Highly Hazardous Chemicals, 29 *CFR* 1910.119.

Buildings covered by this RP are rigid structures intended for permanent use in fixed locations. Tents, fabric enclosures and other soft-sided structures are outside the scope of this document.

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> "Buildings described in API RP 753, *Management of Hazards Associated with Location of Process Plant Portable Buildings*, First Edition, June 2007, as 'portable buildings specifically designed to resist significant blast loads' and intended for permanent use in a fixed location are covered in this document (API RP 752). All other portable buildings are covered by API RP 753." Pages: 34

3rd Edition | December 2009 | Product Number: K75203 | Price: $136.00

RP 753
Management of Hazards Associated with Location of Process Plant Portable Buildings

Provides guidance for reducing the risk to personnel located in portable buildings from potential explosion, fire and toxic release hazards.

While occupied permanent buildings (e.g. control rooms, operator shelters) located near covered process area are typically constructed to be blast and fire resistant, conventional portable buildings (i.e. light wood trailers) are typically not constructed to be blast and fire resistant. Past explosion accidents have demonstrated that occupants of conventional portable buildings are susceptible to injuries from structural failures, building collapse, and building debris and projectiles.

Guidance is provided based on the following principles:

- Locate personnel away from covered process areas consistent with safe and effective operations.
- Minimize the use of occupied portable buildings in close proximity to covered process areas.
- Manage the occupancy of portable building especially during periods of increased risk including unit start up or planned shutdown operations.
- Design, construct, install, and maintain occupied portable buildings to protect occupants against potential hazards.
- Manage the use of portable buildings as an integral part of the design, construction and maintenance operation of a facility. Pages: 22

1st Edition | June 2007 | Product Number: K75301 | Price: $136.00

PROCESS SAFETY—TRAINING COURSES

API RP 752 and 753: Facility Siting Regulations and Compliance
www.api-u.org/FacilitySitingCompliance.html

This course is a management-level overview and addresses the regulatory requirements for facility siting, a review of API RP 752 and RP 753, and an overview of the methods to satisfy the requirements. Anyone managing, performing, or reviewing facility siting needs should attend.

Facility Siting Update: Process Plant Building Hazard Management
www.api-u.org/FacilitySitingUpdate.html

Learn what you need to do to respond to the new recommended practice on *Location of Process Plant Portable Buildings*. Learn what issues are being addressed in revising API RP 752 and what you will need to prepare for in response. The first day is a management overview; the second day is a more technical course designed for the process safety professional who is performing facility siting studies and requires each student to bring a calculator.

Facility Siting Consequence Analysis Techniques
www.api-u.org/FacilitySitingTechniques.html

This course is a continuation of the API RP 752 and 753: Facility Siting Regulations and Compliance course and is designed for the process safety professional performing facility siting studies. Topics covered will include a review of common methodologies to calculate blast loads and building damage for a facility siting study for both permanent and portable buildings. A significant portion of the course will be spent performing example calculations. Note: each student will need to bring a calculator.

HEALTH, ENVIRONMENT AND SAFETY

Cumulative Impact of Environmental Regulations on the U.S. Petroleum Refining, Transportation and Marketing Industries
1st Edition | Product Number: C00015 | available at www.api.org

RP 751
Safe Operation of Hydrofluoric Acid Alkylation Units

Provides guidance to refiners on the safe operations of hydrofluoric acid (HF) alkylation units. Areas specifically covered in the document include hazards management, operating procedures, worker protection, materials & new construction, inspection and maintenance of HF units, transportation, inventory control, relief and utility systems and mitigation options. Provides additional information on elements of a comprehensive HF audit, HF exposure limits, corrosion & materials considerations specific to HF alkylation units, examples of tasks for each type of clothing class and procedures for unloading acid tank trucks & design features of an acid-truck unloading station. Refiners with HF alkylation units will find this document very helpful when performing a Process Hazards Analysis for compliance with OSHA Process Safety Management regulations. Pages: 46

3rd Edition | June 2007 | Product Number: C75103 | Price: $136.00

HEALTH, ENVIRONMENT AND SAFETY: AIR

Publ 337
Development of Emission Factors for Leaks in Refinery Components in Heavy Liquid Service

Estimating air pollutants from stationary sources is necessary for compiling emission inventories, determining emission fees, and meeting the conditions of various permits and compliances. This report provides revised emission factors applicable to refinery components in heavy liquid (HL) service, which were based on extensive field measurements. It also provides data analyses to determine whether the type of distillate or residual hydrocarbon in the stream would influence the emission factors. Pages: 68

August 1996 | Product Number: J33700 | Price: $71.00

HEALTH, ENVIRONMENT AND SAFETY: WATER

Publ 958
Pilot Studies on the Toxicity of Effluents from Conventional And Carbon enhanced Treatment of Refinery Wastewater-Phase III

January 1981

HEALTH, ENVIRONMENT AND SAFETY: SOIL AND GROUNDWATER

Publ 422
Groundwater Protection Programs for Petroleum Refining and Storage Facilities: A Guidance Document

Reflects continuing industry action and commitment to positively address groundwater protection by developing and implementing individual groundwater protection plans. Provides additional guidance to help petroleum facilities identify the types of issues that may need to be addressed in a groundwater protection plan. Intended to help refineries, terminals associated with transportation pipelines, product distribution terminals, and other downstream petroleum storage units develop groundwater protection plans that are tailored to their individual circumstances. Pages: 9

1st Edition | October 1994 | Product Number: C42201 | Price: $63.00

Publ 4760
LNAPL Distribution and Recovery Model (LDRM)

The API LNAPL Distribution and Recovery Model (LDRM) simulate the performance proven hydraulic technologies for recovering free-product petroleum liquid releases to groundwater. The LDRM provides information about LNAPL distribution in porous media and allows the user to estimate LNAPL recovery rates, volumes and times. Documentation for the LDRM is provided in 2 volumes. Volume 1—Distribution for the LDRM is porous media documents the LDRM and provides background information necessary to characterize the behavior of LNAPL in porous media with regard to performance of LNAPL liquid recovery technologies. Volume 2—User and Parameter Selection Guide provides step-by-step instructions for LDRM software. Four example problem applications are presented witch highlight model use, parameter estimation using the API LNAPL Parameters database, and limitations of scenario-based models

January 2007 | Software and documentation can be downloaded from API's web site: goundwater.api.org/lnapl

Publ 800
Literature Survey: Subsurface and Groundwater Protection Related to Petroleum Refinery Operations

This report is the principal product of an API-sponsored project to prepare a background basis for the development of further information on subsurface and groundwater protection at refineries. It contains an explanation of how the literature survey was conducted; annotations for pertinent articles; a discussion of applicable federal statutes and regulations; and annotations for pertinent regulatory programs under the 5 principal statutes that apply to refinery operations.

1st Edition | September 1988 | Product Number: C80000 | Price: $89.00

SECURITY

API Standard for Third Party Network Connectivity

Provides guidance for implementing secure third-party connections between the information technology systems and network of two companies that have a business relations and a common objective. The standard will provide suggestions for companies to establish third-party network connections while protecting their individual systems and data from unauthorized access or manipulation. Pages: 36

October 2007 | Product Number: TSTP01 | Price: $87.00

Security Guidance for the Petroleum Industry

API's Second Edition of "Security Guidance for the Petroleum Industry," is now in use at oil and gas facilities around the world to help managers decide how to deter terrorist attacks. Covering all segments of the industry (production, refining, transportation, pipeline, and marketing), this guidance builds on the existing solid foundation of design and operational regulations, standards, and recommended practices, which relate to facility design and safety, environmental protection, emergency response, and protection from theft and vandalism. Produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies, these guidelines, viewed as a living document, are broadly applicable to facility security in light of September 11, 2001, and provide the starting point for developing security plans at oil and natural gas facilities and operations. Pages: 169

2nd Edition | March 2003 | Product Number: OS0001 | Price: $185.00

Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

The American Petroleum Institute and the National Petrochemical & Refiners Association jointly developed a new methodology for evaluating the likelihood and consequences of terrorist attacks against refineries and petrochemical facilities. "Security Vulnerability Assessment Methodology for Petroleum and Petrochemical Facilities" is designed for companies to use in assessing vulnerabilities and potential damages from different kinds of terrorist attacks. In the post September 11 era, companies have reevaluated and enhanced security at their facilities. The methodology will provide officials with a new analytical tool to determine "the likelihood of an adversary successfully exploiting vulnerability and the resulting degree of damage or impact." This vulnerability assessment methodology was produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies. Pages: 155

October 2004 | Product Number: OSVA02 | Price: $185.00

SECURITY—TRAINING COURSES

Workshop on Industry Security Vulnerability Assessments (SVAs)
www.api-u.org/SVA.html

API presents the leading SVA training for the petroleum, petrochemical and chemical industries. The objective of an SVA is to identify security hazards, threats and vulnerabilities facing a facility and to evaluate the countermeasures to provide for the protection of the public, workers, national interests, the environment, and the company.

Workshop on USCG Regulations for Facility Security Officers (FSOs)
www.api-u.org/FSO.html

Learn about the requirements for Facility Security Officers released in the U.S. Coast Guard (USCG) Final Rule: Part 105, Subpart B. Course materials include a reference CD of over 30 helpful related documents including the regulation, NVICs, API's "Security Vulnerability Assessment for the Petroleum & Petrochemical Industries", and numerous DHS bulletins.

If you have any questions or comments regarding API standards, please visit www.api.org/standards.

NOTE: Free publications with an asterisk are subject to a $10.00 handling charge for each total order, plus actual shipping charges.

UPSTREAM SAFETY STANDARDS

API HF1 ■
Hydraulic Fracturing Operations-Well Construction and Integrity Guidelines

The purpose of this guidance document is to provide guidance and highlight industry recommended practices for well construction and integrity for wells that will be hydraulically fractured. The guidance provided here will help to ensure that shallow groundwater aquifers and the environment will be protected, while also enabling economically viable development of oil and natural gas resources. This document is intended to apply equally to wells in either vertical, directional, or horizontal configurations.

Maintaining well integrity is a key design principle and design feature of all oil and gas production wells. Maintaining well integrity is essential for the two following reasons.

1) To isolate the internal conduit of the well from the surface and subsurface environment. This is critical in protecting the environment, including the groundwater, and in enabling well drilling and production.

2) To isolate and contain the well's produced fluid to a production conduit within the well.

Although there is some variability in the details of well construction because of varying geologic, environmental, and operational settings, the basic practices in constructing a reliable well are similar. These practices are the result of operators gaining knowledge based on years of experience and technology development and improvement. These experiences and practices are communicated and shared via academic training, professional and trade associations, extensive literature and documents and, very importantly, industry standards and recommended practices. Pages: 24

1st Edition | October 2009 | Product Number: GHF101 | Price: $40.00
Free PDF available at www.api.org/Standards/epstandards

RP 49
Recommended Practice for Drilling and Well Service Operations Involving Hydrogen Sulfide

Recommendations set forth in this publication apply to oil and gas well drilling and servicing operations involving hydrogen sulfide. These operations include well drilling, completion, servicing, workover, downhole maintenance, and plug and abandonment procedures conducted with hydrogen sulfide present in the fluids being handled. Coverage of this publication is applicable to operations confined to the original wellbore or original total depth and applies to the selection of materials for installation or use in the well and in the well drilling or servicing operation(s). The presence of hydrogen sulfide in these operations also presents the possibility of exposure to sulfur dioxide from the combustion of hydrogen sulfide. Pages: 29

2nd Edition | May 2001 | Reaffirmed: March 1, 2007
Product Number: G04902 | Price: $85.00
Free PDF available at www.api.org/Standards/epstandards

RP 51R
Environmental Protection for Onshore Oil and Gas Production Operations and Leases

Provides environmentally sound practices, including reclamation guidelines, for domestic onshore oil and gas production operations. It is intended to be applicable to contractors as well as operators. Facilities within the scope of this document include all production facilities, including produced water handling facilities. Offshore and arctic areas are beyond the scope of this document. Operational coverage begins with the design and construction of access roads and well locations, and includes reclamation, abandonment, and restoration operations. Gas compression for transmission purposes or production operations, such as gas lift, pressure maintenance, or enhanced oil recovery (EOR) is included. Annex A provides guidance for a company to consider as a "good neighbor." Pages: 35

1st Edition | July 2009 | Product Number: G51R01 | Price: $50.00
Free PDF available at www.api.org/Standards/epstandards

RP 54
Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations

Includes procedures for promotion and maintenance of safe working conditions for employees engaged in rotary drilling operations and well servicing operations, including special services. Applies to rotary drilling rigs, well servicing rigs, and special services as they relate to operations on locations. Pages: 35

3rd Edition | August 1999 | Reaffirmed: March 1, 2007
Product Number: G54003 | Price: $121.00
Free PDF available at www.api.org/Standards/epstandards

RP 55
Conducting Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide

Covers recommendations for protection of employees and the public, as well as conducting oil and gas producing and gas processing plant operations where hydrogen sulfide is present in the fluids being produced. Pages: 40

2nd Edition | February 1995 | Reaffirmed: March 1, 2007
Product Number: G55002 | Price: $111.00
Free PDF available at www.api.org/Standards/epstandards

RP 67
Recommended Practice for Oilfield Explosives Safety

Applicable to explosives used in oil and gas well operations, more specifically, explosives used inside the wellborne. Guidance is provided for explosives transportation, on-site explosives loading and unloading operations, electrical wireline operations, tubing conveyed operations, self-contained activating tools, setting tools, sidewall sample taker tools, select fire perforating guns, and bullet perforating guns. Recommendations are presented regarding surface equipment and downhole equipment. Recommended training and minimum qualifications are presented for personnel who participate in handling and using explosives at the well site. Pages: 18

2nd Edition | May 2007 | Product Number: G09309 | Price: $82.00
Free PDF available at www.api.org/Standards/epstandards

RP 74
Recommended Practice for Occupational Safety for Onshore Oil and Gas Production Operation

Recommends practices and procedures for promoting and maintaining safe working conditions for personnel engaged in onshore oil and gas production operations, including special services. Pages: 23

1st Edition | October 2001 | Reaffirmed: March 1, 2007
Product Number: G74001 | Price: $59.00
Free PDF available at www.api.org/Standards/epstandards

RP 75
Development of a Safety and Environmental Management Program for Offshore Operations and Facilities

Provides guidance for use in preparing safety and environmental management programs (SEMP) for oil, gas, and sulphur operations and facilities located on the outer continental shelf (OCS). These guidelines are applicable to well drilling, servicing, and production; and pipeline facilities and operations that have the potential for creating a safety or environmental hazard at OCS platform sites. Eleven major program elements are included

for application to these facilities and operations. Identification and management of safety and environmental hazards are addressed in design, construction, startup, operation, inspection, and maintenance of new, existing, and modified facilities Pages: 41

3rd Edition | May 2004 | Product Number: G07503 | Price: $86.00
Free PDF available at www.api.org/Standards/epstandards

RP 75L
Guidance Document for the Development of a Safety and Environmental Management System for Onshore Oil and Natural Gas Production Operation and Associated Activities

This publication was written to provide general information and guidance for the development of a safety and environmental management system (SEMS) for onshore oil and natural gas operations, including drilling, production, and well servicing activities. Although there is an extensive amount of information that has been developed on the topic of safety and environmental management systems, this document focuses on this industry sector to help foster continuous improvement in our industry's safety and environmental performance. It is recognized that many onshore oil and natural gas companies have effective SEMS in place; however, the intent of this document is to provide an additional tool that can assist these and especially other operators in taking the next step toward implementing a complete system at a pace that complements their business plan. For those who already have a mature SEMS in place, this document can be used for continuous improvement of the system. Pages: 12

1st Edition | October 2007 | Product Number: G75L01 | Price: $33.00
Free PDF available at www.api.org/Standards/epstandards

RP 76
Contractor Safety Management for Oil and Gas Drilling and Production Operations

Intended to assist operators, contractors, and subcontractors (third parties) in the implementation of a contractor safety program and improve the overall safety performance while preserving the independent contractor relationship. It is intended for the Upstream segment of the petroleum industry; however, since the Operator requirements and the contracted work are diverse, this publication may not be applicable to all operations at each company or to all contract work performed in those operations. Many oil and gas exploration and production companies contract for equipment and personnel services for a wide range of activities, including drilling production, well servicing, equipment repair, maintenance, and construction. Certain activities of Contractors have the potential to take place either Contractor and/or Operator personnel and/or equipment at risk. It is important that operations are carried out in a safe manner. Operators and contractors need to provide safe work places and to protect the safety of their work places and to protect the safety of their workforces and the general public. When they work together to improve safety, both benefit. Pages: 60

2nd Edition | October 2007 | Product Number: G07602 | Price: $55.00
Free PDF available at www.api.org/Standards/epstandards

MULTI-SEGMENT PUBLICATIONS

RP 752 ■
Management of Hazards Associated with Location of Process Plant Buildings

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3rd Edition | December 2009 | Product Number: K75203 | Price: $136.00

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- Design, construct, install, and maintain occupied portable buildings to protect occupants against potential hazards.
- Manage the use of portable buildings as an integral part of the design, construction and maintenance operation of a facility. Pages: 22

1st Edition | June 2007 | Product Number: K75301 | Price: $136.00

Publ 770
A Manager's Guide to Reducing Human Errors- Improving Human Performance in the Process Industries

Intended for an audience of middle managers to senior executives who have different levels of knowledge about human factors engineering. It is designed to equip them with a basic understanding of the causes of human errors and to suggest ways for reducing human errors at individual facilities. It also describes how to incorporate human reliability analysis (HRA) into process safety management activities. Pages: 85

1st Edition | March 2001 | Product Number: K77001 | Price: $73.00

Human Factors in New Facility Design Tool

Describes a Human Factors Tool that may be used by operating plants as an aid to incorporate human factors principles in the design of equipment that will be operated and maintained by people.

The human factors principles described in this document are intended for new equipment designs; however, many ideas provided in this Tool may be used to improve the operating of existing plants where feasible.

This document focuses only on equipment design. Items such as human error, behavior-based safety, and operating procedure issues are not in the scope.

The Tool covers equipment that is common to both upstream producing and downstream manufacturing operations. Equipment associated with specific activities such as drilling rigs is not specifically addressed. Pages: 71

2nd Edition | October 2005 | Product Number: I0HF02 | Price: $144.00

Human Factors Tool for Existing Operations

The objectives of this tool include:

- providing a tool for operating crews to identify opportunities for latent conditions and human error, and
- improve how Process Hazards Analysis/Hazard Evaluation/Revalidation process address human factors.

The scope of this tool includes existing operations and equipment and human tasks. This tool is intended for use without specific training on human factors. This is a simple process for gathering a few operators and mechanics who are familiar with the equipment/process and who are qualified to identify where traps (latent conditions) in the equipment and tasks (error likely scenarios) exist that make it easy for people to do something wrong.

1st Edition | February 2006 | Product Number: I0HF03 | Price: $60.00

RP 2001
Fire Protection in Refineries

Covers basic concepts of refinery fire protection. It reviews the chemistry and physics of refinery fires; discusses how the design of refinery systems and infrastructure impact the probability and consequences of potential fires; describes fire control and extinguishing systems typically used in refineries; examines fire protection concepts that should be covered in operating and maintenance practices and procedures; and provides information on organization and training for refinery emergency responders. Many of the concepts, systems and equipment discussed in this document are covered in detail in referenced publications, standard or governmental requirements. Pages: 39

8th Edition | May 2005 | Product Number: K20018 | Price: $96.00

Std 2003
Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents

Presents the current state of knowledge and technology in the fields of static electricity, and stray currents applicable to the prevention of hydrocarbon ignition in the petroleum industry and is based on both scientific research and practical experience. The principles discussed in this recommended practice are applicable to other operations where ignitable liquids and gases are handled. Their use should lead to improved safety practices and evaluations of existing installations and procedures. Pages: 76

7th Edition | January 2008 | Product Number: K20037 | Price: $121.00

RP 2009
Safe Welding, Cutting and Hot Work Practices in the Petroleum and Petrochemical Industries

Provides guidelines for safely conducting welding, cutting or other hot work activities in refineries, gas plants, petrochemical plants and other facilitates in the petroleum and petrochemical industries. It provides specific guidance for evaluating procedures for certain types of work on equipment in service. It does not include guidance for compliance with regulations or codes; hot tapping; welding techniques, normal, "safe work" practices; or entry or work in inert environments. Pages: 23

7th Edition | February 2002 | Reaffirmed: August 1, 2007
Product Number: K20097 | Price: $76.00

RP 2027
Ignition Hazards Involved in Abrasive Blasting of Atmospheric Storage Tanks in Hydrocarbon Service

Identifies the ignition hazards involved in abrasive blasting of the exteriors of hydrocarbon storage tanks containing a mixture that is flammable or that can become flammable when air is added. It provides operational guidelines for procedures that significantly reduce ignition risks during abrasive blasting of hydrocarbon tanks that may contain a flammable vapor space. Pages: 4

3rd Edition | March 2002 | Reaffirmed: August 1, 2007
Product Number: C20273 | Price: $71.00

RP 2028
Flame Arresters in Piping Systems

Covers the use and limitations of flame arresters installed in piping systems in the petroleum and petrochemical industries. It provides a general overview of flame arresters currently in use and some potential concerns or limitations. Applicable combustion and flame propogation parameters are discussed including the distinction between arresting flames versus arresting detonations. Pages: 12

3rd Edition | February 2002 | Product Number: K20283 | Price: $57.00

RP 2030
Application of Fixed Water Spray Systems for Fire Protection in the Petroleum and Petrochemical Industries

Provides guidance for the petroleum industry and some petrochemical industry applications (for non-water-reactive petrochemicals with physical and combustion characteristics comparable to hydrocarbons) in determining where water spray systems might be used to provide protection from fire damage for equipment and structures. Pages: 27

3rd Edition | July 2005 | Product Number: K20303 | Price: $67.00

Publ 2201
Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries

Provides information to assist in safely conducting hot tapping operations on equipment in service in the petroleum and petrochemical industries. No document can address all situations nor answer all potential questions, however, the understanding of potential hazards, and application of this knowledge, can help reduce the probability and severity of incidents. Pages: 27

5th Edition | June 2003 | Product Number: K22015 | Price: $83.00

RP 2210
Flame Arresters for Vents of Tanks Storing Petroleum Products

Discusses the benefits and detriments associated with the use of flame arresters on vents utilized on atmospheric fixed-roof tanks. Pages: 4

3rd Edition | June 2000 | Product Number: K22103 | Price: $63.00

Publ 2214
Spark Ignition Properties of Hand Tools

Emphasizes that the use of nonferrous hand tools, sometimes referred to as nonsparking tools, is not warranted as a fire prevention measure in petroleum operations. Pages: 2

4th Edition | July 2004 | Product Number: K221404 | Price: $63.00

RP 2216
Ignition Risk of Hydrocarbon Vapors by Hot Surfaces in the Open Air

Provides information concerning the potential for ignition of hydrocarbons that are exposed to hot surfaces in the open air. Hydrocarbon liquids, when heated sufficiently, can ignite without the application of a flame or spark. The ignition of hydrocarbons by hot surfaces may occur when oil is released under pressure and sprays upon a hot surface or is spilled and lies upon a hot surface for a period of time. Understanding the mechanism and

dynamics of auto-ignition is an important step in preventing or controlling the ignition of hydrocarbons by hot surfaces in the open air. In addition to the information provided herein, appropriate industry standards and other information may assist users to understand the potential hazards of hydrocarbon auto-ignition (such as spontaneous combustion) not specifically covered by this publication and implement appropriate prevention and control measures. Pages: 5

2nd Edition | December 2003 | Product Number: K22160 | Price: $57.00

Std 2217A
Guidelines for Work in Inert Confined Spaces in the Petroleum and Petrochemical Industries

Provides guidelines for safely entering and working in and near confined spaces that have inert atmospheres and can aid employers in preparing specific procedures for working safely in inert confined spaces, recognizing that because of its unique nature, the hazards and requirements for inert entry are generally greater than for "normal" permit-required confined space (PRCS) entry. API 2217A applies to confined spaces that have been intentionally purged with an inert gas until: -the oxygen level in the vapor space is too low to support combustion, and -any gases in or flowing out of the confined space are below flammable or reactive levels.

Typical inert entry work in the petroleum and petrochemical industry includes work to service or replace catalyst in reactors. Pages: 25

4th Edition | July 2009 | Product Number: K2217A4 | Price: $85.00

Publ 2218
Fireproofing Practices in Petroleum and Petrochemical Processing Plants

Intended to provide guidelines for selecting, applying, and maintaining fire proofing materials that are designed to limit the extent of fire-related property loss in the petroleum and petrochemical industries. Pages: 35

2nd Edition | August 1999 | Product Number: K22182 | Price: $118.00

RP 2219
Safe Operation of Vacuum Trucks in Petroleum Service

Vacuum trucks are used in all segments of the petroleum industry with varied applications. Appropriate safe operating practices may vary because of different hazards associated with the materials to be moved and the facilities serviced. This Recommended Practice seeks to assist vacuum truck owners and operators in the development and implementation of practical and safe operating practices that will help identify hazards and reduce risks. Pages: 42

3rd Edition | November 2005 | Product Number: K22193 | Price: $108.00

Std 2220
Contractor Safety Performance Process

Provides guidance for petroleum and chemical industry facility owners and contractors for improving their contractor safety programs. These measures include procedure for contractor selection, training and job-site orientation; performance reviews; measurement and evaluation; and safety program checklists. Pages: 23

2nd Edition | March 2005 | Product Number: K222002 | Price: $80.00

RP 2221
Contractor and Owner Safety Program Implementation

Intended to assist refining and petrochemical industry facility owners and contractors implement (or improve) an effective contractor safety and health program.

2nd Edition | August 2004 | Product Number: K22212 | Price: $147.00

Publ 2384
2005 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

This summary reports on cases recordable in 2005 under the US Bureau of Labor Statistics' record keeping guidelines. The survey is based on data submitted to the American Petroleum Institute by oil and gas companies. The report includes information regarding injuries, illness, and fatalities, lost workday cases, and incidence rates by function.

May 2006 | Product Number: K23841 | Price: $100.00

Publ 2383
2004 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2005 | Product Number: K23831 | Price: $100.00

Publ 2382
2003 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

May 2005 | Product Number: K23821 | Price: $100.00

Publ 2381
2002 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

June 2003 | Product Number: K23811 | Price: $100.00

Publ 2380
2001 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2002 | Product Number: K23801 | Price: $100.00

Publ 2379
2000 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2001 | Product Number: K23790 | Price: $100.00

Publ 2378
1999 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

June 2000 | Product Number: K23781 | Price: $100.00

Publ 2377
1998 Summary of Occupational Injuries, Illness, and Fatalities in the Petroleum Industry

March 1999 | Product Number: K23771 | Price: $100.00

Publ 2376
1997 Summary of Occupational Injuries, Illness, and Fatalities in the Petroleum Industry

June 1998 | Product Number: K23761 | Price: $93.00

Publ 2375
1996 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

June 1997 | Product Number: K23751 | Price: $93.00

1995 Summary of U.S. Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

May 1996 | Product Number: K19983 | Price: $93.00

1994 Summary of U.S. Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

June 1995 | Product Number: K19984 | Price: $93.00

1993 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

June 1994 | Product Number: K19985 | Price: $93.00

1992 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

August 1993 | Product Number: K19986 | Price: $80.00

1991 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

September 1992 | Product Number: K19987 | Price: $80.00

1990 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

July 1991 | Product Number: K19988 | Price: $80.00

1989 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

January 1989 | Product Number: K19996 | Price: $57.00

Publ 2510A

Fire Protection Considerations for the Design and Operation of Liquefied Petroleum Gas (LPG) Storage Facilities

Supplements API Std 2510 and addresses the design, operation, and maintenance of liquefied petroleum gas (LPG) storage facilities from the standpoint of prevention and control of releases, fire protection design, and fire control measures. The history of LPG storage facility safety experience, facility design philosophy, operating and maintenance procedures, and various fire protection and fire-fighting approaches are presented. The storage facilities covered are LPG installations (storage vessels and associated loading/unloading/transfer systems) at marine and pipeline terminals, natural gas processing plants, refineries, petrochemical plants, and tank farms.

2nd Edition | December 1996 | Product Number: K2510A | Price: $98.00

STORAGE TANK SAFETY STANDARDS

Std 2015 ◆

Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks

(ANSI/API Std 2015-2001)

Provides safety practices for preparing, emptying, isolating, ventilating, atmospheric testing, cleaning, entry, hot work and recommissioning activities in, on and around atmospheric and low - pressure (up to and including 15 psig) aboveground storage tank that have contained flammable, combustible or toxic materials. This standard directs the user from decommissioning (removal from service) through recommissioning (return to service). This standard applies to stationary tanks used in all sectors of the petroleum and petrochemical plants, and terminals. Pages: 49

6th Edition | August 2001 | Reaffirmed: May 1, 2006
Product Number: K20156 | Price: $130.00

RP 2016 ◆

Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks

(ANSI/API RP 2016-2001)

Supplements the requirements of ANSI/API Std 2015, *Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks*, Sixth Edition. This RP provides guidance and information on the specific aspects of tank cleaning, in order to assist employers (owners/operators and contractors) to conduct safe tank cleaning operations in accordance with the requirements of ANSI/API Standard 2015. Pages: 98

1st Edition | August 2001 | Reaffirmed: May 1, 2006
Product Number: K20161 | Price: $186.00

RP 2021

Management of Atmospheric Storage Tank Fires

Provides experience-based information to enhance the understanding of fires in atmospheric storage tanks containing flammable and combustible materials. It presents a systematic management approach which can assist tank fire prevention. If fires do occur, this information can help responders optimize fire suppression techniques to reduce the severity of an incident and reduce the potential for escalation Pages: 83

4th Edition | May 2001 | Reaffirmed: May 1, 2006
Product Number: K20214 | Price: $130.00

RP 2023

Guide for Safe Storage and Handling of Heated Petroleum Derived Asphalt Products and Crude Oil Residua

Describes phenomena which can occur, and precautions to be taken in the storage and handling of asphalt products and residua derived from crude petroleum. It applies when these materials are stored in heated tanks at refineries and bulk storage facilities, and transported in tank vehicles. Pages: 44

3rd Edition | August 2001 | Product Number: K20233 | Price: $106.00

Publ 2026 ◆

Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service

Provides safety information for individuals responsible for performing maintenance or repairs that involve descent onto the floating roofs of petroleum storage tanks. Pages: 15

2nd Edition | April 1998 | Reaffirmed: June 1, 2006
Product Number: K20262 | Price: $60.00

Publ 2207 ◆

Preparing Tank Bottoms for Hot Work

Addresses only the safety aspects of hot work on petroleum storage tank bottoms. It discusses safety precautions for preventing fires, explosions and associated injuries. The term hot work as used in this publication, is defined as an operation that can produce a spark or flame hot enough to ignite flammable vapors. Pages: 32

6th Edition | December 2007 | Product Number: K22076 | Price: $83.00

RP 2350

Overfill Protection for Storage Tanks in Petroleum Facilities

Covers overfill protection for all aboveground storage tanks in petroleum facilities, including refineries, terminals, bulk plants and pipeline terminals that receive Class I (flammable) or Class II (combustible) liquids. It is not intended to include service station tanks, process tanks or tanks used in initial crude oil production activities.

3rd Edition | January 2005 | Product Number: K23503 | Price: $84.00

If you have any questions or comments regarding API standards, please visit www.api.org/standards.

PUBLICATIONS

Spec 12B ◆
Specification for Bolted Tanks for Storage of Production Liquids

Covers material, design, fabrication, and testing requirements for vertical, cylindrical, aboveground, closed and open top, bolted steel storage tanks with internal pressures approximately atmospheric at various sizes and capacities ranging from 100 to 10000 barrels. Tanks covered by this specification have been designed using established engineering calculations to determine minimum metal thickness and bolting specifications for each size tank filled with water. This specification is designed to provide the oil production industry with tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. Pages: 33

15th Edition | October 2008 | Effective Date: March 31, 2009
Product Number: G12B15 | Price: $94.00

Spec 12D ◆
Specification for Field Welded Tanks for Storage of Production Liquids

Covers material, design, fabrication, and testing requirements for vertical, cylindrical, aboveground, closed top, welded steel storage tanks with internal pressures approximately atmospheric at various sizes and capacities ranging from 500 to 10000 barrels. Tanks covered by this specification have been designed using established engineering calculations to determine minimum metal thickness and bolting specifications for each size tank filled with water. This specification is designed to provide the oil production industry with tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. Pages: 27

11th Edition | October 2008 | Effective Date: March 31, 2009
Product Number: G12D11 | Price: $94.00

Spec 12F ◆
Specification for Shop Welded Tanks for Storage of Production Liquids

Covers material, design, fabrication, and testing requirements for shop-fabricated vertical, cylindrical, aboveground, closed top, welded steel storage tanks with internal pressures approximately atmospheric at various sizes and capacities ranging from 90 to 750 barrels. Tanks covered by this specification have been designed using established engineering calculations to determine minimum metal thickness and bolting specifications for each size tank filled with water. This specification is designed to provide the oil production industry with tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. This specification is for the convenience of purchasers and manufacturers in ordering and fabricating tanks. Pages: 25

12th Edition | October 2008 | Effective Date: March 31, 2009
Product Number: G12F12 | Price: $94.00

Spec 12P ◆
Specification for Fiberglass Reinforced Plastic Tanks

Covers material, design, fabrication, and testing requirements for fiberglass reinforced plastic (FRP) tanks. Only shop-fabricated, vertical, cylindrical tanks are covered. Tanks covered by this specification are intended for above ground and atmospheric pressure service at various sizes and capacities ranging from 90 to 1500 barrels. Unsupported cone bottom tanks are outside the scope of this specification. Standard designs are based on a maximum working pressure equal to the hydrostatic head of the stored fluid plus 6 in. of water column (0.217 psig) and 2 in. of water column vacuum. Design criteria are dependent on method of construction. Filament winding, chop-spray and combinations of these methods (commonly referred to as chop-hoop) are covered. Tanks constructed using hand lay-up (contact molding) are to be designed to the same standard as chop-spray construction. Pages: 27

3rd Edition | October 2008 | Effective Date: March 31, 2009
Product Number: G12P03 | Price: $94.00

RP 12R1
Recommended Practice for Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service

This recommended practice should be considered as a guide on new tank installations and maintenance of existing tanks. It contains recommendations for good practices in (a) the collection of well or lease production, (b) gauging, (c) delivery to pipeline carriers for transportation, and (d) other production storage and treatment operations. This recommended practice is intended primarily for application to tanks fabricated to API Specifications 12F, 12D, 12F, and 12P when employed in on-land production service; but its basic principles are applicable to atmospheric tanks of other dimensions and specifications when they are employed in similar oil and gas production, treating, and processing services. It is not applicable to refineries, petrochemical plants, marketing bulk stations, or pipeline storage facilities operated by carriers. Pages: 49

5th Edition | August 1997 | Reaffirmed: April 2, 2008
Product Number: G12R15 | Price: $128.00

Publ 301
Aboveground Storage Tank Survey: 1989

This report presents a survey of petroleum aboveground storage tanks. Estimates are made of the number, capacity, and age of the tanks in each sector of the petroleum industry. Survey forms and statistical extrapolations methodology are included in the report. Pages: 44

1991 | Product Number: J30100 | Price: $61.00

Publ 306
An Engineering Assessment of Volumetric Methods of Leak Detection in Aboveground Storage Tanks

Provides the results of a leak detection project in aboveground storage tanks which utilized volumetric methods to detect leaks. A series of field tests were conducted on a 114-foot diameter tank that contained a heavy naphtha petroleum product. The analytical and experimental results of this project suggest that volumetric leak detection methods can be used to detect small leaks in aboveground storage tanks.

1991 | Product Number: J30600 | Price: $71.00

Publ 307
An Engineering Assessment of Acoustic Methods of Leak Detection in Aboveground Storage Tanks

This report provides the results of a leak detection project in aboveground storage tanks which utilized acoustic methods to detect leaks. A series of field tests were conducted on a 114-foot diameter tank that contained a heavy naphtha petroleum product. The analytical and experimental results of this project suggest that passive-acoustic leak detection methods can be used to detect small leaks in aboveground storage tanks.

1991 | Product Number: J30700 | Price: $71.00

Publ 315
Assessment of Tankfield Dike Lining Materials and Methods

To assess tankfield materials and methods of containment, API commissioned a review of environmental regulations as well as a survey of candidate liner materials and installation methods to explore the technology

base. The study was limited to diked areas surrounding storage tanks. Liner installations for secondary containment underneath tanks were excluded. Pages: 50

July 1993 | Product Number: J31500 | Price: $71.00

Publ 322
An Engineering Evaluation of Acoustic Methods of Leak Detection in Aboveground Storage Tanks

Describes a set of controlled experiments conducted on a 40-ft. diameter refinery tank to determine the nature of acoustic leak signals and ambient noise under a range of test conditions. The features of a leak detection test needed for high performance are explored. The report concludes that accurate and reliable leak detection of aboveground storage tanks can be achieved through the use of acoustic methods.

January 1994 | Product Number: J32200 | Price: $71.00

Publ 323
An Engineering Evaluation of Volumetric Methods of Leak Detection in Aboveground Storage Tanks

Two volumetric approaches to detecting leaks from aboveground storage tanks—precision temperature sensors and mass measurement approaches—are evaluated in this report. A set of controlled experiments on a 117-ft. diameter refinery tank is used to examine the effects of differential pressure on conventional level and temperature measurement systems. The features of a leak detection test needed for high performance are also explored.

January 1994 | Product Number: J32300 | Price: $71.00

Publ 325
An Evaluation of a Methodology for the Detection of Leaks in Aboveground Storage Tanks

This report describes the results of the fourth phase of a program to define and advance the state of the art of leak detection for aboveground storage tanks (ASTs). Three leak-detection technologies are examined—passive-acoustic, soil-vapor monitoring, and volumetric—over a wide range of tank types, petroleum fuels, and operational conditions. This study also assesses the applicability of a general leak detection methodology involving multiple tests and product levels as well as determines the integrity of 14 ASTs using two or more test methods.

May 1994 | Product Number: J32500 | Price: $87.00

Publ 327
Aboveground Storage Tank Standards: A Tutorial

This tutorial presents procedures and examples to help designers, owners, and operators of aboveground storage tanks understand and comply with API's Recommended Practices, Standards, and Specifications concerning leak prevention. These API documents provide requirements designed to minimize environmental hazards associated with spills and leaks. The tutorial also shows how the API inspection and maintenance requirements influence the design of such tanks. It does not attempt to address additional rules and requirements imposed by individual jurisdictions or states. Pages: 70

September 1994 | Product Number: J32700 | Price: $71.00

Publ 328
Laboratory Evaluation of Candidate Liners for Secondary Containment of Petroleum Products

This document provides comparative data on the physical properties of liner materials as a function of their controlled exposure to fuels and/or additives. Six membrane and two clay liners were tested. Project test results were used to rank the liners in terms of vapor permeation and relative changes in properties such as chemical resistance and liquid conductivity measured after immersion. Pages: 142

January 1995 | Product Number: J32800 | Price: $80.00

Publ 334
A Guide to Leak Detection for Aboveground Storage Tanks

Written for terminal managers, tank owners, operators, and engineers, this report provides useful background on leak detection technologies--volumetric, acoustic, soil-vapor monitoring, and inventory control--for aboveground storage tanks. Characteristics affecting the performance of each technology are discussed. Pages: 38

September 1992 | Product Number: J33400 | Price: $71.00

Publ 340
Liquid Release Prevention and Detection Measures for Aboveground Storage Facilities

Written for managers, facility operators, regulators, and engineers involved in the design and selection of facility components and prevention of liquid petroleum releases, this report presents an overview of available equipment and procedures to prevent, detect or provide environmental protection from such releases. Also presented are the advantages, disadvantages, and relative costs, as well as maintenance and operating parameters of various control measures. Pages: 116

October 1997 | Product Number: J34000 | Price: $80.00

Publ 341
A Survey of Diked-area Liner Use at Aboveground Storage Tank Facilities

In 1997, API conducted a survey designed to evaluate the effectiveness of diked-area liner systems and to document operational problems involved with their use. The survey data indicated that the effectiveness of liners in protecting the environment is limited because liner systems frequently fail. The data further showed that there are few releases from aboveground storage tanks that would be addressed by diked-area liners. Because there were few releases, the data do not directly demonstrate the effectiveness or ineffectiveness of liner systems in containing releases; however, it was concluded that measures that prevent aboveground storage tank releases are more effective in protecting the environment and are more cost-effective in the long run. Pages: 32

February 1998 | Product Number: J34100 | Price: $71.00

Publ 346
Results of Range-finding Testing of Leak Detection and Leak Location Technologies for Underground Pipelines

This study reviewed the current leak detection and leak location methods for pressurized underground piping commonly found at airports, refineries, and fuel terminals. Four methods for testing underground pipes of 6 to 18 inches in diameter and 250 feet to 2 miles in length were selected for field demonstration. These technologies were constant-pressure volumetric testing, pressure-decay testing, chemical tracer testing, and acoustic emission testing. No single leak detection system was found to work in all situations; site-specific conditions may affect any method, and combinations of methods may provide the most effective approach. Pages: 252

November 1998 | Product Number: J34600 | Price: $80.00

Publ 353
Managing Systems Integrity of Terminal and Tank Facilities

Although the risk management principles and concepts in this document are universally applicable, this publication is specifically targeted at integrity management of aboveground liquid petroleum storage facilities. The applicable petroleum terminal and tank facilities covered in this document are associated with distribution, transportation, and refining facilities as described in API Std 2610 and API Pub 340.

This document covers the issues of overall risk management, risk assessment, risk ranking, risk mitigation, and performance measures applicable to an overall integrity management program. The appendices

include two possible methodologies for conducting a risk assessment and a workbook that can be used to perform the risk assessment method outlined in Appendix A. Pages: 316

1st Edition | October 2006 | Product Number: J35300 | Price: $146.00

RP 575 ◆
Inspection of Atmospheric & Low Pressure Storage Tanks
(ANSI/API RP 575-2004)

Covers the inspection of atmospheric and low-pressure storage tanks that have been designed to operate at pressures from atmospheric to 15 psig. Includes reasons for inspection, frequency and methods of inspection, methods of repair, and preparation of records and reports. This recommended practice is intended to supplement API Std 653, which covers the minimum requirements for maintaining the integrity of storage tanks after they have been placed in service. Pages: 60

2nd Edition | April 2005 | Product Number: C57502 | Price: $126.00

Std 620
Design and Construction of Large, Welded, Low-Pressure Storage Tanks
(Purchase includes addenda to the current edition of the standard)

Covers large, field-assembled storage tanks of the type described in 1.2 that contain petroleum intermediates (gases or vapors) and finished products, as well as other liquid products commonly handled and stored by the various branches of the industry. The rules presented in this standard cannot cover all details of design and construction because of the variety of tank sizes and shapes that may be constructed. Where complete rules for a specific design are not given, the intent is for the Manufacturer (subject to the approval of the Purchaser's authorized representative) to provide design and construction details that are as safe as those which would otherwise be provided by this standard. Pages: 254

11th Edition | February 2008 | Product Number: C62011 | Price: $353.00

Std 650 ◆
Welded Tanks for Oil Storage
(Purchase includes addenda to the current edition of the standard.)

Establishes minimum requirements for material, design, fabrication, erection, and testing for vertical, cylindrical, aboveground, closed and open top wielded carbon or stainless steel storage tanks in various sizes and capacities for internal pressures approximating atmospheric pressure (internal pressures not exceeding the weight of the roof plates), but a higher internal pressure is permitted when addition requirements are met. This standard applies only to tanks whose entire bottom is uniformly supported and to tanks in non-refrigerated service that have a maximum design temperature of 93 °C (200 °F) or less. Pages: 376

11th Edition | June 2007 | Product Number: C65011 | Price: $425.00

RP 651 ◆
Cathodic Protection of Aboveground Storage Tanks
(ANSI/API RP 651-2006)

Presents procedures and practices for achieving effective corrosion control on aboveground steel storage tank bottoms through the use of cathodic protection. It is the intent of this recommended practice to provide information and guidance for the application of cathodic protection to existing and new storage tanks in hydrocarbon service. Specific cathodic protection designs are not provided. Certain practices recommended herein may also be applicable to tanks in other services. Corrosion control methods based on chemical control of the environment or the use of protective coatings are not covered in detail. Pages: 33

3rd Edition | January 2007 | Product Number: C65103 | Price: $102.00

RP 652 ◆
Lining of Aboveground Petroleum Storage Tank Bottoms
(ANSI/API RP 652-2005)

Provides guidance on achieving effective corrosion control by the application of tank bottom linings in aboveground storage tanks in hydrocarbon service. It contains information pertinent to the selection of lining materials, surface preparation, lining application, cure, and inspection of tank bottom linings for existing and new storage tanks. In many cases, tank bottom linings have proven to be an effective method of preventing internal corrosion of steel tank bottoms.

Provides information and guidance specific to aboveground steel storage tanks in hydrocarbon service. Certain practices recommended herein may also applicable to tanks in other services. This recommended practice is intended to serve only as a guide and detailed tank bottom lining specifications are not included. Pages: 15

3rd Edition | October 2005 | Product Number: C65203 | Price: $113.00

Std 653 ◆■
Tank Inspection, Repair, Alteration, and Reconstruction

Covers the inspection, repair, alteration, and reconstruction of steel aboveground storage tanks used in the petroleum and chemical industries. Provides the minimum requirements for maintaining the integrity of welded or riveted, nonrefrigerated, atmospheric pressure, aboveground storage tanks after they have been placed in service. Pages: 152

4th Edition | April 2009 | Product Number: C65304 | Price: $205.00

Publ 937
Evaluation of Design Criteria for Storage Tanks with Frangible Roof Joints

Describes research that evaluated the ability of the present API 650 tank design criteria to ensure the desired frangible joint behavior. Particular questions include: (1) evaluation of the area inequality as a method to predict the buckling response of the compression ring, (2) effect of roof slope, tank diameter, and weld size on the frangible joint, and (3) effect of the relative strength of the roof-to-shell joint compared to the shell-to-bottom joint. Pages: 73

1st Edition | April 1996 | Product Number: C93701 | Price: $131.00

Publ 937-A
Study to Establish Relations for the Relative Strength of API 650 Cone Roof, Roof-to-Shell and Shell-to-Bottom Joints

The purpose of this study is to investigate the relative strengths of the roof-to-shell and shell-to-bottom joints, with the goal of providing suggestions for frangible roof design criteria applicable to smaller tanks. Pages: 68

1st Edition | August 2005 | Product Number: C937A0 | Price: $118.00

TR 939-D
Stress Corrosion Cracking of Carbon Steel in Fuel Grade Ethanol—Review, Experience Survey, Field Monitoring, and Laboratory Testing

Technical Report 939-D, Second Edition, addresses stress corrosion cracking (SCC) in carbon steel equipment used in distribution, transportation, storage, and blending of denatured fuel ethanol. API, with assistance from the Renewable Fuels Association (RFA), conducted research on the potential for metal cracking and product leakage in certain portions of the fuel ethanol distribution system. TR 939-D contains a review of existing literature, results of an industry survey on cracking events and corrosion field monitoring, information on mitigation and prevention Pages: 172

2nd Edition | May 2007 | Product Number: C939D0 | Price: $155.00

RP 1604
Closure of Underground Petroleum Storage Tanks

Provides operating procedures that may be used for the abandonment, removal, storage, temporarily-outservice, and sale of used underground tanks that have contained gasoline or other flammable liquids Pages: 9

3rd Edition | March 1996 | Reaffirmed: November 1, 2001
Product Number: A16043 | Price: $73.00

RP 1615
Installation of Underground Petroleum Storage Systems

A guide to procedures and equipment that should be used for the proper installation of underground petroleum storage systems. For use by architects, engineers, tank owners, tank operators, and contractors. Applies to underground storage tank systems that store petroleum products at retail and commercial facilities. Pages: 53

5th Edition | March 1996 | Reaffirmed: November 1, 2001
Product Number: A16155 | Price: $118.00

RP 1631
Interior Lining and Periodic Inspection of Underground Storage Tanks

Provides minimum recommendations for the interior lining of existing steel and fiberglass reinforced plastic underground tanks used to store petroleum-based motor fuels and middle distillates. Recommendations and procedures to be followed by contractors, mechanics, and engineers are presented. Methods for vapor-freeing tanks, removing sediment, and cleaning interior surfaces of steel and fiberglass tanks are also presented, as are guidelines for identifying tanks that maybe lined. Pages: 25

5th Edition | June 2001 | Product Number: A16315 | Price: $83.00

RP 1632
Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems

Covers two methods of providing cathodic protection for buried steel petroleum storage and dispensing systems. Provides information specific to buried steel structures such as motor fuel storage tanks and delivery piping waste oil tanks, heating-oil tanks, and automobile lifts installed at service stations. As a companion document, the NACE Publication RP 02-85, *Corrosion Control of Underground Storage Tank Systems by Cathodic Protection*, may be purchased with RP 1632 as a set only. This document details cathodic protection guidance for engineers and technicians. Pages: 18

3rd Edition | January 1996 | Reaffirmed: June 1, 2002
Product Number: A16323 | For RP 1632 Only: Price: $63.00
For RP 1632 and NACE RP 02-85 as a Set: Price $94.00

RP 1650
Set of Six API Recommended Practices on Underground Petroleum Storage Tank Management

A complete set of API Recommended Practices 1604 (removal), 1615 (installation), 1621 (stock control), 1628 (spill clean-up), 1631 (interior lining), and 1632 (cathodic protection) in a vinyl binder. See description of individual recommended practices below. The 6 RPs are referenced as appropriate standards and guidance documents in recently-mandated federal technical standards for underground storage systems. The latest edition of each of the six standards will be included in the package.

Product Number: A16502 | Price: $287.00

Std 2000 /ISO 28300 ■
Venting Atmospheric and Low-pressure Storage Tanks
Petroleum, petrochemical and natural gas industries—Venting of atmospheric and low-pressure storage tanks

Covers the normal and emergency vapour venting requirements for aboveground liquid petroleum or petroleum products storage tanks and aboveground and underground refrigerated storage tanks, designed for operation at pressures from full vacuum through 103,4 kPa (ga) [15 psig]. Discussed in this standard are the causes of overpressure and vacuum; determination of venting requirements; means of venting; selection, and installation of venting devices; and testing and marking of relief devices.

Intended for tanks containing petroleum and petroleum products but it can also be applied to tanks containing other liquids; however, it is necessary to use sound engineering analysis and judgment whenever this International Standard is applied to other liquids.

This standard does not apply to external floating-roof tanks.

This edition of Std 2000 is the identical national adoption of ISO 28300, *Petroleum, petrochemical and natural gas industries—Venting of atmospheric and low-pressure storage tanks*. Pages: 76

6th Edition | November 2009 | Product Number: CX20006 | Price: $143.00

Std 2015 ◆
Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks
(ANSI/API Std 2015-2001)

Provides safety practices for preparing, emptying, isolating, ventilating, atmospheric testing, cleaning, entry, hot work and recommissioning activities in, on and around atmospheric and low-pressure (up to and including 15 psig) aboveground storage tank that have contained flammable, combustible or toxic materials. This standard directs the user from decommissioning (removal from service) through recommissioning (return to service). This standard applies to stationary tanks used in all sectors of the petroleum and petrochemical plants, and terminals. Pages: 49

6th Edition | August 2001 | Reaffirmed: May 1, 2006
Product Number: K20156 | Price: $130.00

RP 2016 ◆
Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks
(ANSI/API RP 2016-2001)

Supplements the requirements of ANSI/API Standard 2015, *Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks*, Sixth Edition. This RP provides guidance and information on the specific aspects of tank cleaning, in order to assist employers (owners/operators and contractors) to conduct safe tank cleaning operations in accordance with the requirements of ANSI/API Standard 2015. Pages: 98

1st Edition | August 2001 | Reaffirmed: May 1, 2006
Product Number: K20161 | Price: $186.00

RP 2021
Management of Atmospheric Storage Tank Fires

Provides experience-based information to enhance the understanding of fires in atmospheric storage tanks containing flammable and combustible materials. It presents a systematic management approach which can assist tank fire prevention. If fires do occur, this information can help responders optimize fire suppression techniques to reduce the severity of an incident and reduce the potential for escalation Pages: 83

4th Edition | May 2001 | Reaffirmed: May 1, 2006
Product Number: K20214 | Price: $130.00

Publ 2026 ◆
Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service

Provides Safety information for individuals responsible for performing maintenance or repairs that involve descent onto the floating roofs of petroleum storage tanks. Pages: 15

2nd Edition | April 1998 | Reaffirmed: June 1, 2006
Product Number: K20262 | Price: $60.00

RP 2207 ◆
Preparing Tank Bottoms for Hot Work

Addresses only the safety aspects of hot work on petroleum storage tank bottoms. It discusses safety precautions for preventing fires, explosions and associated injuries. The term hot work as used in this publication, is defined as an operation that can produce a spark or flame hot enough to ignite flammable vapors. Pages: 32

6th Edition | December 2007 | Product Number: K22076 | Price: $83.00

RP 2350
Overfill Protection for Storage Tanks in Petroleum Facilities

This document covers overfill protection for all aboveground storage tanks in petroleum facilities, including refinieris, terminals, abulk plants and plipline terminals that receive Class I (flammable) or Class II (combustible) liquids. It is not intended to include service station tanks, process tanks or tanks used in initial crude oil production activities.

3rd Edition | January 2005 | Product Number: K23503 | Price: $84.00

Std 2510
Design and Construction of LPG Installations

Provides minimum requirements for the design and construction of installations for the storage and handling of LPG at marine and pipeline terminals, natural gas processing plants, refineries, petrochemical plants, and tank farms. This standard covers storage vessels, loading and unloading systems, piping and related equipment. Pages: 22

8th Edition | May 2001 | Product Number: C25108 | Price: $100.00

Std 2610
Design, Construction, Operation, Maintenance & Inspection of Terminal and Tank Facilities
(ANSI/API 2610-2005)

Covers the design, construction, operation, inspection, and maintenance of petroleum terminal and tank facilities associated with marketing, refining, pipeline, and other similar activities. Covers site selection and spacing, pollution prevention and waste management, safe operations, fire prevention and protection, tanks, dikes and berms, mechanical systems (pipe, valves, pumps and piping systems), product transfer, corrosion protection, structures, utilities and yard, and removals and decommissioning. Pages: 53

2nd Edition | May 2005 | Product Number: C26102 | Price: $118.00

Impact of Gasoline Blended with Ethanol on the Long-Term Structural Integrity of Liquid Petroleum Storage Systems and Components
Executive Summary and Literature Review

Summarizes the results of a literature review conducted for the American Petroleum Institute on the impact of gasoline blended with ethanol on the long-term structural integrity of liquid petroleum storage systems and components.

It is anticipated that the use of ethanol in motor fuels will continue to increase. This has generated interest about the potential long-term structural effects of ethanol on liquid petroleum storage systems, including underground storage tanks (USTs), underground piping, and associated components.

The objective of the literature review is to determine the state of industry knowledge and research on the effects of ethanol /gasoline blends on the long-term structural integrity of UST systems and components. This review is intended to assist decision-makers on further research requirements and needed changes or supplements to existing standards for underground storage system components used for storing and dispensing gasoline blended with ethanol.

Appendix A may be purchased separately as an electronic database file. The database synopsis' and bibliographic information for all articles reviewed for the project. The report is organized by article index numbers. Reference numbers cited in this report refer to the article index number.

Executive Summary | 2003 | Price: $63.00
Appendix A—Literature Review | 2003 | Price $123.00

MANUAL OF PETROLEUM MEASUREMENT STANDARDS

The following Petroleum Measurement Standards have application in Storage Tanks:

Chapter 2.2A
Measurement and Calibration of Upright Cylindrical Tanks by the Manual Strapping Method

Procedures for calibrating upright cylindrical tanks used primarily for the storage of petroleum liquids. Chapter 2.2A addresses necessary measurement procedures to determine total and incremental tank volumes and procedures for computing volumes. Both metric and customary units are included. The metric units reflect what is available in commercial equipment. The standard also provides guidelines for recalibration and computerization of capacity tables. Chapter 2.2A should be used in conjunction with Chapter 2.2B. These two standards combined supersede the previous API Standard 2550, *Measurement and Calibration of Upright Cylindrical Tanks*. Pages: 58

1st Edition | February 1995 | Reaffirmed: February 1, 2007
Product Number: H022A1 | Price: $121.00

Chapter 2.2B
Calibration of Upright Cylindrical Tanks Using the Optical Reference Line Method

Describes measurement and calculation procedures for determining the diameters of upright, welded (lap/butt) cylindrical tanks, or vertical cylindrical tanks, with a smooth outside surface and either floating or fixed roofs. The optical reference line method is an alternative to the manual tank strapping method for determining tank diameter. Chapter 2.2B should be used in conjunction with API Standard 2.2A. Pages: 8

1st Edition | March 1989 | Reaffirmed: December 1, 2007
Product Number: H30023 | Price: $80.00

Chapter 2.2C/ISO 7507-3:1993
Calibration of Upright Cylindrical Tanks Using the Optical-Triangulation Method
(ANSI/API MPMS 2.2C-2002)

Describes the calibration of vertical cylindrical tanks by means of optical triangulation using theodolites. The method is an alternative to other methods such as strapping (*MPMS* Chapter 2.2A) and the optical-reference-line method (*MPMS* Chapter 2.2B).

This edition of Chapter 2.2C is the national adoption of ISO 7507-3:1993. Pages: 19

1st Edition | January 2002 | Reaffirmed: May 1, 2008
Product Number: H022C1 | Price: $80.00

Chapter 2.2D/ISO 7507-4:1995
Calibration of Upright Cylindrical Tanks Using the Internal Electro-optical Distance Ranging Method

Petroleum and liquid petroleum products—Calibration of vertical cylindrical tanks—Part 4: Internal electro-optical distance ranging method
(ANSI/API MPMS 2.2D-2003)

Specifies a method for the calibration of upright cylindrical tanks having diameters greater than 5 m by means of internal measurements using an electro-optical distance-ranging instrument, and for the subsequent compilation of tank capacity tables.

This edition of Chapter 2.2D is the National Adoption of ISO 7507-4:1995. Pages: 13

1st Edition | August 2003 | Reaffirmed: February 11, 2009
Product Number: H022D1 | Price: $80.00

Chapter 2.2E/ISO 12917-1:2002
Petroleum and Liquid Petroleum Products—Calibration of Horizontal Cylindrical Tanks—Part 1: Manual Methods
(includes Errata, dated November 2009)
(ANSI/API *MPMS* 2.2E-2004)

Specifies manual methods for the calibration of nominally horizontal cylindrical tanks, installed at a fixed location. It is applicable to horizontal tanks up to 4 m (13 ft) in diameter and 30 m (100 ft) in length. The methods are applicable to insulated and non-insulated tanks, either when they are above-ground or underground. The methods are applicable to pressurized tanks, and to both knuckle-dish-end and flat-end cylindrical tanks as well as elliptical and spherical head tanks. This Chapter is applicable to tanks inclined by up to 10 % from the horizontal provided a correction is applied for the measured tilt. For tanks over and above these dimensions and angle of tilt, appropriate corrections for tilt and appropriate volume computations should be based on the "Coats" equation.

This edition of Chapter 2.2E is the national adoption of ISO 12917-1:2002. Pages: 18

1st Edition | April 2004 | Reaffirmed: October 16, 2009
Product Number: HX202E01 | Price: $85.00

Chapter 2.2F/ISO 12917-2:2002
Petroleum and Liquid Petroleum Products—Calibration of Horizontal Cylindrical Tanks—Part 2: Internal Electro-optical Distance-ranging Method
(ANSI/API *MPMS* 2.2F-2004)

Specifies a method for the calibration of horizontal cylindrical tanks having diameters greater than 2 m (6 ft) by means of internal measurements using an electro-optical distance-ranging instrument, and for the subsequent compilation of tank-capacity tables. This method is known as the internal electro-optical distance-ranging (EODR) method.

This edition of Chapter 2.2F is the National adoption of ISO 12917-2:2002. Pages: 14

1st Edition | April 2004 | Reaffirmed: October 16, 2009
Product Number: HH202F01 | Price: $74.00

Std 2555
Liquid Calibration of Tanks

Describes the procedure for calibrating tanks, or portions of tanks, larger than a barrel or drum by introducing or withdrawing measured quantities of liquid. Pages: 14

1st Edition | September 1966 | Reaffirmed: March 11, 2009
Product Number: H25550 | Price: $94.00

RP 2556
Correcting Gauge Tables for Incrustation

Incrustation is defined in this publication as any material that adheres to the internal vertical sidewall surfaces of a tank when the tank is otherwise empty. The tables given in this recommended practice show the percent of error of measurement caused by varying thicknesses of uniform incrustation in tanks of various sizes. Pages: 3

2nd Edition | August 1993 | Reaffirmed: September 26, 2008
Product Number: H25560 | Price: $73.00

Chapter 3.1A
Standard Practice for the Manual Gauging of Petroleum and Petroleum Products

Describes the following: (a) the procedures for manually gauging the liquid level of petroleum and petroleum products in non-pressure fixed-roof, floating-roof tanks and marine tank vessels, (b) procedures for manually gauging the level of free water which may be found with the petroleum or petroleum products, (c) methods used to verify the length of gauge tapes under field conditions and the influence of bob weights and temperature on the gauge tape length, and (d) the influences that may affect the position of gauging reference point (either the datum plate or the reference gauge point). Throughout this standard the term petroleum is used to denote petroleum, petroleum products, or the liquids normally associated with the petroleum industry. The method used to determine the volume of tank contents determined from gauge readings is not covered in this standard. The determination of temperature, API gravity, and suspended sediment and water of the tank contents are not within the scope of this standard. Pages: 25

2nd Edition | August 2005 | Product Number: H301A02 | Price: $91.00

Chapter 3.1A-SP
Standard Practice for the Manual Gauging of Petroleum and Petroleum Products—Spanish

The Spanish translation of Chapter 3.1A.

2nd Edition | August 2005 | Product Number: H3010ASP | Price: $96.00

Chapter 3.1B
Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Tanks by Automatic Tank Gauging

Covers level measurement of liquid hydrocarbons in stationary, aboveground, atmospheric storage tanks using automatic tank gauges (ATGs). This publication discusses automatic tank gauging in general, calibration of ATGs for custody transfer and inventory control, and the requirements for data collection, transmission, and receiving. The appendices discuss the operation and installation of the most commonly used ATG equipment and of the less commonly used, electronic ATGs. Pages: 17

2nd Edition | June 2001 | Reaffirmed: October 1, 2006
Product Number: H301B2 | Price: $94.00

Chapter 3.3
Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Pressurized Storage Tanks by Automatic Tank Gauging

Provides guidance on the installation, calibration, and verification of automatic tank gauges (ATGs) used in custody transfer for measuring the level of liquid hydrocarbons having a Reid vapor pressure of 15 psi (103 kilopascals) or greater, stored in stationary, pressurized storage tanks. This standard also provides guidance on the requirements for data collection, transmission, and receiving. Pages: 10

1st Edition | June 1996 | Reaffirmed: October 1, 2006
Product Number: H03031 | Price: $80.00

Chapter 3.4
Standard Practice for Level Measurement of Liquid Hydrocarbons on Marine Vessels by Automatic Tank Gauging

Provides guidance on the selection, installation, calibration, and verification of automatic tank gauges (ATGs) for measuring the level of liquid hydrocarbons having a Reid vapor pressure less than 15 pounds per square inch absolute (103 kPa), transported aboard marine vessels (tankers and barges). This standard also provides guidance on the requirements for data collection, transmission, and receiving. This standard supersedes all applicable sections of API Standard 2545. Pages: 10

1st Edition | April 1995 | Reaffirmed: March 1, 2006
Product Number: H03041 | Price: $80.00

Chapter 12.1.1
Calculation of Static Petroleum Quantities
Part 1—Upright Cylindrical Tanks and Marine Vessels
(includes Chapter 12 Addendum dated August 2007)

Guides the user through the steps necessary to calculate static liquid quantities, at atmospheric conditions, in upright, cylindrical tanks and marine tank vessels. The standard defines terms employed in the calculation of static petroleum quantities. The standard also specifies equations that allow the values of some correction factors to be computed. Fundamental to this process is the understanding that in order for different parties to be able to reconcile volumes, they must start with the same basic information (tank capacity table, levels, temperatures, and so forth) regardless of whether the information is gathered automatically or manually. This standard does not address the calculation of clingage, nonliquid material, small quantities (such as onboard quantities, quantities remaining on board, and wedge formula, where material is not touching all bulkheads on marine vessels), and vapor space calculations. Pages: 34

2nd Edition | November 2001 | Reaffirmed: February 28, 2008
Product Number: H12112 | Price: $91.00

Chapter 12.1.1-SP
Calculation of Static Petroleum Quantities
Part 1—Upright Cylindrical Tanks and Marine Vessels—Spanish

The Spanish translation of Chapter 12.1.1.

2nd Edition | October 2001 | Product Number: H120101SP | Price: $96.00

Chapter 16.2
Mass Measurement of Liquid Hydrocarbons in Vertical Cylindrical Storage Tanks by Hydrostatic Tank Gauging

Provides guidance on the installation, commissioning, maintenance, validation, and calibration of hydrostatic tank gauging (HTG) systems for the direct measurement of static mass of liquid hydrocarbons in storage tanks. This first edition is applicable to hydrostatic tank gauging systems that use pressure sensors with one port open to the atmosphere. It is also applicable for use on vertical cylindrical atmospheric storage tanks with either fixed or floating roofs. (Based entirely on ISO 11223-1, Part 1) Pages: 20

1st Edition | November 1994 | Reaffirmed: February 1, 2007
Product Number: H16021 | Price: $94.00

Publ 2558
Wind Tunnel Testing of External Floating-Roof Storage Tanks

Presents the results of a wind tunnel study to determine the local wind velocities, wind directions, and roof pressures on external floating roof tanks.

1st Edition | June 1993 | Product Number: H25580 | Price: $189.00

Chapter 19.1
Evaporative Loss From Fixed-roof Tanks
(includes Addendum August 2008)
(previously Publication 2518)

Contains an improved method for estimating the total evaporative losses or the equivalent atmospheric hydrocarbon emissions from fixed-roof tanks that contain multicomponent hydrocarbon mixture stocks (such as petroleum liquid stocks like crude oils) or single-component hydrocarbon stocks (such as petrochmeical stocks like ethanol).

3rd Edition | March 2002 | Reaffirmed: January 5, 2007
Product Number: H19013 | Price: $122.00

Chapter 19.1A
Evaporation Loss From Low-pressure Tanks
(previously Bulletin 2516)

Breathing, working, and leakage losses encountered in low-pressure tanks (atmospheric to 15 psig) are discussed in this bulletin, which also provides equations for calculating these values. Pages: 12

1st Edition | March 1962 | Reaffirmed: February 1, 2006
Product Number: H25160 | Price: $94.00

Chapter 19.1D
Documentation File for API Manual of Petroleum Measurement Standards Chapter 19.1—Evaporative Loss From Fixed-roof Tanks
(includes Erratum dated June 1994)

Presents information on the development of theoretical equations; comparisons with test data; a sensitivity analysis of the loss equation; and other pertinent information that was developed during the preparation of API *MPMS* Chapter 19.1. Pages: 190

1st Edition | March 1993 | Product Number: H30553 | Price: $166.00

Chapter 19.2
Evaporative Loss From Floating-roof Tanks
(previously Publications 2517 and 2519)

Contains methods for estimating the total evaporative losses or the equivalent atmospheric hydrocarbon emissions from external floating-roof tanks (EFRTs) and freely vented internal floating-roof tanks (IFRTs), as well as for tanks with external-type floating roofs that also have a freely vented fixed roof. This type of tank is referred to as a covered floating-roof tank (CFRT) in this document. Pages: 83

2nd Edition | September 2003 | Reaffirmed: August 15, 2008
Product Number: H19022 | Price: $159.00

Chapter 19.3, Part A
Wind Tunnel Test Method for the Measurement of Deck-fitting Loss Factors for External Floating-roof Tanks

Describes the procedures to establish evaporative loss factors for deck fittings on external floating-roof tanks. The test method involves measuring the weight loss of a test assembly over time. The standard specifies the test apparatus, instruments, test procedures and calculation procedures to be used. It also addresses the variables to be measured, format for reporting the test values and their associated uncertainty. Pages: 27

1st Edition | June 1997 | Reaffirmed: March 1, 2007
Product Number: H1903A | Price: $118.00

Chapter 19.3, Part B
Air Concentration Test Method—Rim-seal Loss Factors for Floating-roof Tanks

Describes the procedures to establish evaporative rim-seal loss factors for rim seals used on external floating-roof tanks. The test method involves passing a controlled flow rate of air through a test chamber that contains a test liquid and a test rim seal, and measuring the concentration of the test liquid vapor in the air streams entering and leaving the test chamber. The standard specifies the test apparatus, instruments, test procedures, and

calculation procedures to be used. It also addresses the variables to be measured, format for reporting the test values, and their associated uncertainty. Pages: 30

1st Edition | August 1997 | Reaffirmed: July 24, 2007
Product Number: H1903B | Price: $118.00

Chapter 19.3, Part C
Weight Loss Test Method for the Measurement of Rim-seal Loss Factors for Internal Floating-roof Tanks

Provides a uniform method for measuring evaporative loss from rim seals used on aboveground storage tanks. This information can be utilized to establish product specific loss factors in terms of loss rate and seal gap area. Pages: 29

1st Edition | July 1998 | Reaffirmed: October 1, 2007
Product Number: H1903C | Price: $118.00

Chapter 19.3, Part D
Fugitive Emission Test Method for the Measurement of Deck-seam Loss Factors for Internal Floating-roof Tanks

Establishes a uniform method for measuring evaporative deck-seam loss factors and deck-joint loss factors of mechanically-joined deck seams that are used on internal floating-roof tanks. These deck-seam loss factors and deck-joint loss factors are to be determined in terms of their loss rate at specified pressure differences across the deck seam or deck joint for certification purposes. Pages: 31

1st Edition | June 2001 | Reaffirmed: December 3, 2007
Product Number: H1903D | Price: $118.00

Chapter 19.3, Part E
Weight Loss Test Method for the Measurement of Deck-fitting Loss Factors for Internal Floating-roof Tanks

Describes the test methods to be used to establish evaporative loss factors for deck fittings on internal floating-roof tanks. This chapter specifies the test apparatus, instruments, test procedures, and calculation procedures to be used. The standard also addresses the requirements for reporting test report values. Pages: 30

1st Edition |May 1997| Reaffirmed: December 3, 2007
Product Number: H1903E | Price: $118.00

Chapter 19.3, Part H
Tank Seals and Fittings Certification—Administration

Provides guidance for the administration of the former API Tank Seals and Fittings Certification Program. The document includes detailed methods for monitoring and analysis of tests conducted on individual devices and describes the steps in the certification process. Pages: 53

1st Edition | March 1998 | Reaffirmed: February 23, 2009
Product Number: H1903H | Price: $118.00

Chapter 19.4
Recommended Practice for Speciation of Evaporative Losses (includes Errata dated March 2007)

Contains recommended methods for estimating specific organic compound emissions from storage tanks, and marine vessel transfer operations handling multi-component hydrocarbon mixtures (such as crude oils and gasoline) associated with petroleum operations. Pages: 77

2nd Edition | September 2005 | Product Number: H19042 | Price: $118.00

PUBLICATIONS

Spec 6A ◆
Specification for Wellhead and Christmas Tree Equipment
(includes Errata 3, dated June 2006; Errata 4, dated August 2007; Addendum 1, dated February 2008; Addendum 2, dated December 2008; Addendum 3, dated December 2008; Addendum 4, dated December 2008; Errata 5, dated May 2009)

Specifies requirements and gives recommendations for the performance, dimensional and functional interchangeability, design, materials, testing, inspection, welding, marking, handling, storing, shipment, purchasing, repair and remanufacture of wellhead and christmas tree equipment for use in the petroleum and natural gas industries. This Standard does not apply to field use, field testing or field repair of wellhead and christmas tree equipment. This standard is applicable to the following specific equipment: wellhead equipment (casing head housings, casing head spools, tubing head spools, cross-over spools, multi-stage head housings and spools); connectors and fittings (cross-over connectors, tubing head adapters, top connectors, tees and crosses, fluid-sampling devices, adapter and spacer spools); casing and tubing hangers (mandrel hangers, slip hangers); valves and chokes (single valves, multiple valves, actuated valves, valves prepared for actuators, check valves, chokes, surface and underwater safety valves and actuators, back-pressure valves); loose connectors (weld neck connectors, blind connectors, threaded connectors, adapter and spacer connectors, bullplugs, valve-removal plugs); and other equipment (actuators, hubs, pressure boundary penetrations, ring gaskets, running and testing tools, wear bushings). This Standard defines service conditions, in terms of pressure, temperature and material class for the well-bore constituents, and operating conditions. This Standard establishes requirements for five product specification levels (PSL). These five PSL designations define different levels of technical quality requirements.

This edition of API Spec 6A is the modified national adoption of ISO 10423:2003. An informative annex is included covering the requirements of the API Monogram Program for equipment covered in the specification. Pages: 412

19th Edition | July 2004 | Effective Date: February 1, 2005
Product Number: GX06A19 | Price: $252.00

Std 6A718 ■
Nickel Base Alloy 718 (UNS N07718) for Oil and Gas Drilling and Production Equipment

Provides requirements for Nickel Base Alloy 718 (UNS N07718) that are intended to supplement the existing requirements of API Spec 6A and ISO 10423. These additional requirements include detailed process control requirements and detailed testing requirements. The purpose of these additional requirements is to ensure that the Nickel Base Alloy 718 used in the manufacture of API Spec 6A or ISO 10423 pressure-containing and pressure-controlling components is not embrittled by the presence of an excessive level of deleterious phases. This standard is intended to apply to pressure containing and pressure controlling components covered by API Spec 6A and ISO 10423, but is not invoked by API Spec 6A and ISO 10423. This standard is applicable when invoked by the equipment manufacturer or the equipment purchaser. Pages: 18

2nd Edition | December 2009 | Product Number: G6A7182 | Price: $85.00

Spec 6AV1 ◆
Specification for Verification Test of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service
(Includes Errata dated December 1996)

The purpose of this specification is to establish requirements to:

- Verify the basic performance requirements (PR1) standard service surface safety valves (SSV) and underwater safety valves (USV) valve design.
- Verify the basic SSVAJSV actuator design.
- Verify the basic PR2 sandy service SSVNSV valve design; and,
- To demonstrate the verification testing covered by this specification that is required to qualify specific valve bore sealing mechanism manufactured under API Spec 6A for PR2 sandy service safety valves.

Included are minimum acceptable standards for verification testing of SSVs AJSVs for two performance requirement levels. To qualify, a SSVNSV valve must pass the verification test specified in Section 4. The two performance requirement levels are:

- PRI Standard Service—This performance requirement level of SSV/USV is intended for use on oil or gas wells that do not exhibit the detrimental effects of sand erosion or fouling; and
- PR2 Sandy Service—This performance level of SSVNSV is intended for use on oil or gas wells where a substance such as sand could be expected to cause a SSVAJSV valve failure.

This valve must also meet the requirements of performance level PRI Standard Service. Pages: 14

1st Edition | February 1996 | Reaffirmed: April 30, 2008
Product Number: G06AV1 | Price: $73.00

Spec 6D/ISO 14313:2007 ◆
Specification for Pipeline Valves
Petroleum and natural gas industries—Pipeline transportation systems—Pipeline valves

Specifies requirements and provides recommendations for the design, manufacturing, testing and documentation of ball, check, gate and plug valves for application in pipeline systems meeting ISO 13623 or similar requirements for the petroleum and natural gas industries. This Specification is not applicable to subsea pipeline valves, as they are covered by a separate Specification (API Spec 6DSS). This Specification is not for application to valves for pressure ratings exceeding PN 420 (Class 2 500).

This edition of API Specification 6D is the identical national adoption of ISO 14313:2007, *Petroleum and natural gas industries—Pipeline transportation systems—Pipeline valves*. Pages: 79

23rd Edition | March 2008 | Effective Date: October 1, 2008
Product Number: GX6D23 | Price: $127.00

RP 6DR
Repair and Remanufacture of Pipeline Valves

This recommended practice (RP) provides guidelines for the repair and remanufacture of steel ball, check, gate, and plug valves normally used in pipeline applications, as defined by API Spec 6D. This RP covers repair or remanufacturing of end user's (owner's) valves for continued service in the owner's production applications. Repaired or remanufactured valves may not meet API and/or the OEM standard requirements for new valves. The owner is responsible for the correct application of valves repaired or remanufactured per this document. It does not cover repair or remanufacture of used or surplus valves intended for resale. Furthermore, field repair is outside the scope of this document. Pages: 9

1st Edition | February 2006 | Product Number: G06DR1 | Price: $73.00

Spec 6DSS/ISO 14723:2009 ◆■
Specification for Subsea Pipeline Valves
Petroleum and natural gas industries—Pipeline transportation systems—Subsea pipeline valves

Specifies requirements and gives recommendations for the design, manufacturing, testing and documentation of ball, check, gate and plug valves for subsea application in offshore pipeline systems meeting the requirements of ISO 13623 for the petroleum and natural gas industries. This Standard is not applicable to valves for pressure ratings exceeding PN 420 (Class 2500).

This edition of API Spec 6DSS is the identical national adoption of ISO 14723, *Petroleum and natural gas industries—Pipeline transportation systems—Subsea pipeline valves*. This specification contains the API Monogram Annex as part of the U.S. national adoption. Pages: 72

2nd Edition | December 2009 | Effective Date: June 1, 2010
Product Number: GX6DSS2 | Price: $160.00

Spec 6FA
Fire Test for Valves
(Includes Erratas, December 2006, and December 2008)

It is the purpose of this document to establish, the requirements for testing and evaluating the pressure-containing performance of API 6A and 6D valves when exposed to fire. The performance requirements of this document are intended to establish standard limits of acceptability regardless of size or pressure rating. This document establishes acceptable levels for leakage through the test valve and also external leakage after exposure to a fire for a 30 minute time period. The burn period has been established on the basis that it represents the maximum time required to extinguish most fires. Fires of greater duration are considered to be of a major magnitude with consequences greater than those anticipated in this test. Pages: 7

3rd Edition | April 1999 | Reaffirmed: July 1, 2006
Product Number: G06FA3 | Price: $94.00

Spec 6FA
Fire Test for Valves—Russian

Russian translation of Specification 6FA.

3rd Edition | April 1999 | Product Number: G06FA3R | Price: $99.00

Spec 6FC ■
Specification for Fire Test for Valves With Automatic Backseats

Establishes the requirements for testing and evaluating the pressure-containing performance of API Specs 6A and 6D automatic backseating valves when exposed to fire. The performance requirements of this document are intended to establish standard limits of acceptability regardless of size or pressure rating. This document establishes acceptable levels for leakage through the test valve and also external leakage after exposure to a fire for a 30-minute time period, both before and after reworking the stuffing box. The burn period has been established on the basis that it represents the maximum time required to extinguish most fires. Fires of greater duration are considered to be of a major magnitude with consequences greater than those anticipated in this test. Pages: 9

4th Edition | March 2009 | Product Number: G06FC3 | Price: $94.00

Spec 6FD
Specification for Fire Test for Check Valves

Establishes the requirements for testing and evaluating the pressure containing performance of API Specs 6A and 6D check valves when exposed to fire. The performance requirements of this document are intended to establish standard limits of acceptability regardless of size or pressure rating. This document establishes acceptable levels of leakage through the test valve and also external leakage after exposure to a fire for a 30-minute time period. The burn period has been established on the basis that it represents the maximum time required to extinguish most fires. Fires of greater duration are considered to be of a major magnitude with consequences greater than those anticipated in this test. Pages: 9

1st Edition | February 1995 | Reaffirmed: September 1, 2008
Product Number: G06FD1 | Price: $86.00

Spec 14A/ISO 10432:2004 ◆
Specification for Subsurface Safety Valve Equipment
Petroleum and natural gas industries—Downhole equipment—Subsurface safety valve equipment

Provides the minimum acceptable requirements for subsurface safety valves (SSSVs). It covers subsurface safety valves including all components that establish tolerances and/or clearances which may affect performance or interchangeability of the SSSVs. It includes the interface connections to the flow control or other equipment, but does not cover the connections to the well conduit.

This edition of API Spec 14A is the identical national adoption of ISO 10432, *Petroleum and natural gas industries—Downhole equipment—Subsurface safety valve equipment*. Pages: 79

11th Edition | October 2005 | Effective Date: May 1, 2006
Product Number: GX14A11 | Price: $166.00

RP 14B/ISO 10417:2004
Design, Installation, Repair and Operation of Subsurface Safety Valve Systems
Petroleum and natural gas industries—Subsurface safety valve systems—Design, installation, operation and redress

Establishes requirements and provides guidelines for configuration, installation, test, operation and documentation of subsurface safety valve (SSSV) systems. In addition, this Standard establishes requirements and provides guidelines for selection, handling, redress and documentation of SSSV downhole production equipment.

This edition of API RP 14B is the identical national adoption of ISO 10417, *Petroleum and natural gas industries—Subsurface safety valve systems—Design, installation, operation and redress*. Pages: 31

5th Edition | October 2005 | Product Number: GX14B05 | Price: $111.00

RP 14B/ISO 10417:2004
Design, Installation, Repair and Operation of Subsurface Safety Valve Systems—Russian

Russian translation of Recommended Practice 14B.

5th Edition | October 2005 | Product Number: GX14B05 | Price: $117.00

RP 14H
Recommended Practice for Installation, Maintenance and Repair of Surface Safety Valves and Underwater Safety Valves Offshore

One of the means of assuring positive wellstream shutoff is the use of the wellhead surface safety valve (SSV) or underwater safety valve (USV). It is imperative that the SSV/USV be mechanically reliable. It should therefore be operated, tested and maintained in a manner to assure continuously reliable performance. The purpose of this recommended practice is to provide guidance for inspecting, installing, operating, maintaining, and onsite repairing SSVs/USVs manufactured according to API Spec 6A (17th Edition or later), Clause 10.20 or API Spec 14D (withdrawn). Included are procedures for testing SSVs/USVs. This document covers guidelines for inspecting, installing, maintaining, onsite repairing, and operating SSVs/USVs. Nothing in this document is to be construed as a fixed rule without regard to sound engineering judgment nor is it intended to override applicable federal, state or local laws. Pages: 15

5th Edition | August 2007 | Product Number: G14H05 | Price: $115.00

RP 591
Process Valve Qualification Procedure

Provides recommendations for evaluation of a manufacturer's valve construction and quality assurance program for the purpose of determining a manufacturer's capability to provide new valves manufactured in accordance with the applicable API standards listed in Section 2.

Qualification of valves under this recommended practice is "manufacturing facility specific" and does not cover valves manufactured by other manufacturing facilities, whether owned by the same manufacturer or a third party. Pages: 16

4th Edition | December 2008 | Product Number: C59104 | Price: $89.00

Std 594 ◆
Check Valves: Flanged, Lug, Wafer and Butt-welding

Covers design, materials, face-to-face dimensions, pressure-temperature ratings, and examination, inspection, and test requirements for gray iron, ductile iron, steel, and alloy single and dual plate check valves. Valve configurations include wafer, wafer-lug, and double-flanged type with facings that will permit installation between ASME and MSS flanges that conform to the standards and specifications listed in the Refinery Service Value Standards. Pages: 11

6th Edition | September 2004 | Product Number: C59406 | Price: $89.00

Std 594
Check Valves: Flanged, Lug, Wafer and Butt-welding—Russian

Russian translation of Standard 594.

6th Edition | September 2004 | Product Number: C59406R | Price: $93.00

Std 598 ■
Valve Inspection and Testing

Covers inspection, examination, supplementary examinations, and pressure test requirements for resilient-seated, nonmetallic-seated (e.g. ceramic), and metal-to-metal-seated valves of the gate, globe, plug, ball, check, and butterfly types. Pages: 11

9th Edition | September 2009 | Product Number: C59809 | Price: $84.00

Std 599 ◆
Metal Plug Valves-Flanged, Threaded and Welding Ends

Covers steel, nickel base and other alloy plug valves with flanged or butt-welding ends and ductile iron plug valves with flanged ends in sizes NPS 1/2 through NPS 24 and threaded or socket-welding ends for sizes NPS 1/2 through NPS 2. Valve bodies conforming to ASME B16.34 may have one flange and one butt-welding end. Pages: 9

6th Edition | October 2007 | Product Number: C59906 | Price: $78.00

Std 600 ■◆
Steel Gate Valves—Flanged and Butt-welding Ends, Bolted Bonnets

Specifies the requirements for a heavy-duty series of bolted bonnet steel gate valves for petroleum refinery and related applications where corrosion, erosion and other service conditions would indicate a need for full port openings, heavy wall sections and large stem diameters. Pages: 22

12th Edition | March 2009 | Effective Date: September 1, 2009
Product Number: C60012 | Price: $115.00

Std 602 ◆
Steel Gate, Globe, and Check Valves for Sizes DN 100 and Smaller for the Petroleum and Natural Gas Industries

This international standard specifies the requirements for a series of compact steel gate, globe and check valves for petroleum and natural gas industry applications.

It is applicable to valves of:

- nominal pipe sizes NPS 1/4, NPS 3/8, NPS 1/2, NPS 3/4, NPS 1, NPS 1 1/4, NPS 1 1/2, NPS 2, NPS 2 1/2, NPS 3, and NPS 4;
- corresponding to nominal sizes DN 8, DN 10, DN 15, DN 20, DN 25, DN 32, DN 40, DN 50, DN 65, DN 80, and DN 100.

It is also applicable to pressure designations of Class 150, Class 300, Class 600, Class 800 and Class 1500.

Class 800 is not a listed class designation, but is an intermediate class number widely used for socket welding and threaded end compact valves.

It includes provisions for the following valve characteristics.

- Outside screw with rising stems (OS & Y), in sizes 1/4 NPS 4 (8 DN 100) and pressure designations including Class 800.
- Inside screw with rising stems (ISRS), in sizes 1/4 NPS 2 1/2 (8 DN 65) and pressure designations of classes 800.
- Socket welding or threaded ends, in sizes 1/4 NPS 2 1/2 (8 DN 65) and pressure designations of Class 800 and Class 1500.
- Flanged or butt-welding ends, in sizes 1/2 NPS 4 (15 DN 100) and pressure designations of Class 150 through Class 1500, excluding flanged end Class 800.
- Bonnet Joint Construction
- Bolted, welded and threaded with seal weld for classes 1500 and union nut for classes 800.
- Standard and full-bore body seat openings.
- Materials, as specified.
- Testing and inspection.

This publication is applicable to valve end flanges in accordance with ASME B16.5, valve body ends having tapered pipe threads to ASME B1.20.1 or ISO 7-1, valve body ends having socket weld ends to ASME B16.11 and butt-weld connections per the requirements described within this standard. It is applicable to extended body construction in sizes 1/2 NPS 2 (15 DN 50) and pressure designations of Class 800 and Class 1500, and to bellows and bellows assembly construction as may be adaptable to gate or globe valves in sizes 1/4 NPS 2 (8 DN 50). It covers bellows stem seal type testing requirements. Pages: 50

9th Edition | October 2009 | Effective Date: March 31, 2010
Product Number: C60209 | Price: $106.00

Std 603 ◆
Corrosion-Resistant, Bolted Bonnet Gate Valves--Flanged and Butt-Welding Ends

Specifies the requirements for corrosion-resistant bolted bonnet gate valves meeting the requirements of ASME B16.34, Standard Class, for valves having flanged or butt-weld ends in sizes NPS 1/2 through 24, corresponding to nominal pipe sizes in ASME B36.10M, and Classes 150, 300, and 600.

Covers requirements for corrosion resistant gate vales for use in process piping applications. Covered are requirements for outside-screw-and-yoke (OS&Y) valves with rising stems, non-rising hand-wheels, bolted bonnets, and various types of gate configurations. Pages: 12

7th Edition | June 2007 | Product Number: C60307 | Price: $72.00

Std 603 *
Corrosion-Resistant, Bolted Bonnet Gate Valves—Flanged and Butt-Welding Ends—Russian

Russian translation of Standard 603.

7th Edition | June 2007 | Product Number: C60307R | Price: $76.00

* These translated versions are provided for the convenience of our customers and are not officially endorsed by API. The translated versions shall neither replace nor supersede the English-language versions, which remain the official Standards. API shall not be responsible for any discrepancies or interpretations of these translations. Translations may not include any Addenda or Errata to the document. Please check the English-language versions for any updates to the documents.

Std 607/ISO 10497
Testing of Valves-Fire Type-testing Requirements

Specifies fire type-testing requirements and a fire type-test method for confirming the pressure-containing capability of a valve under pressure during and after the fire test. It does not cover the testing requirements for valve actuators other than manually operated gear boxes or similar mechanisms when these form part of the normal valve assembly. Other types of valve actuators (e.g. electrical, pneumatic or hydraulic) may need special protection to operate in the environment considered in this valve test, and the fire testing of such actuators is outside the scope of this Standard. Pages: 16

5th Edition | June 2005 | Product Number: CX60705 | Price: $74.00

Std 607/ISO 10497 *
Testing of Valves-Fire Type-testing Requirements-Russian

Russian translation of Standard 607.

5th Edition | June 2005 | Product Number: CX60705R | Price: $78.00

Std 608 ◆
Metal Ball Valves—Flanged, Threaded and Butt-Welding Ends

Covers metal ball valves used in on-off service that have butt-welding of flanged ends for nominal pipe size NPS 1/2 through NPS 12 and threaded or socket-welding ends for sizes NPS 1/2 through NPS 2, corresponding to the nominal pipe sizes in ASME B36.10M. Also covers additional requirements for ball valves that are otherwise in full conformance to the requirements of ASME B16.34, Standard Class. Pages: 17

4th Edition | December 2008 | Effective Date: June 1, 2009
Product Number: C60804 | Price: $95.00

Std 609 ◆■
Butterfly Valves: Double-flanged, Lug- and Wafer-type

Covers design, materials, face-to-face dimensions, pressure-temperature ratings, and examination, inspection and test requirements for gray iron, ductile iron, bronze, steel, nickel-based alloy, or special alloy butterfly valves that provide tight shutoff in the closed position. The following two categories of butterfly valves are included. Category AóManufacturerís rated cold working pressure (CWP) butterfly valves, usually with a concentric disc and seat configuration. Sizes covered are NPS 2 to NPS 48 for valves having ASME Class 125 or Class 150 flange bolting patterns. Category B—ASME Class and pressure-temperature rated butterfly valves that have an offset seat and either an eccentric or a concentric disc configuration. These valves may have a seat rating less than the body rating. For lug and wafer, Class 150, 300, and 600, sizes covered are NPS 3 to NPS 24. For double flanged long pattern, Class 150, 300, and 600, sizes covered are NPS 3 to NPS 36. For double flanged short pattern, Class 150 and 300, sizes covered are NPS 3 to NPS 48. For double-flanged short pattern, Class 600, sizes covered are NPS 3 to NPS 24. Pages: 30

7th Edition | October 2009 | Effective Date: March 31, 2010
Product Number: C60907 | Price: $89.00

RP 621
Reconditioning of Metallic Gate, Globe, and Check Valves

Provides guidelines for reconditioning heavy wall (API 600 type) carbon steel, ferritic alloy (up to 9 % Cr), stainless steel, and nickel alloy gate, globe, and check valves for ASME pressure classes 150, 300, 400, 600, 900, 1500, and 2500. Guidelines contained in this RP apply to flanged and butt weld cast or forged valves. Pages: 18

2nd Edition | December 2005 | Product Number: C62102 | Price: $123.00

RP 621 *
Reconditioning of Metallic Gate, Globe, and Check Valves-Russian

Russian translation of Recommended Practice 621.

2nd Edition | December 2005 | Product Number: C62102R | Price: $129.00

Std 622
Type Testing of Process Valve Packing for Fugitive Emissions

Specifies the requirements for comparative testing of block valve stem packing for process applications where fugitive emissions are a consideration. Packing(s) shall be suitable for use at –20 °F to 1000 °F (–29 °C to 538 °C). Factors affecting fugitive emissions performance that are considered by this Standard include temperature, pressure, thermal cycling, mechanical cycling and corrosion. Pages: 23

1st Edition | August 2006 | Product Number: C62201 | Price: $123.00

* These translated versions are provided for the convenience of our customers and are not officially endorsed by API. The translated versions shall neither replace nor supersede the English-language versions, which remain the official Standards. API shall not be responsible for any discrepancies or interpretations of these translations. Translations may not include any Addenda or Errata to the document. Please check the English-language versions for any updates to the documents.

Note that member discounts do not apply to material available from sources other than the American Petroleum Institute through IHS.

Exploration and Production

PUBLICATIONS

The following publications may be ordered from IHS.

Introduction to Oil and Gas Production
(Book 1 in the Vocational Training Series)

Serves as a primer for oil and gas operations. It covers the origins and accumulation of oil and gas, the well, well treatment and wellhead, artificial lift, well testing, separation, treatment and storage, gauging and metering, production, offshore production and structures, corrosion, enhanced recovery, production personnel, tools and equipment, pipe, valves and fittings, reports and records, state and federal regulations, environmental, health and safety concerns, economic considerations, and future trends. Pages: 120

5th Edition | June 1996 | Reaffirmed: March 1, 2007
Product Number: GVT015 | Price: $152.00

Subsurface Salt Water Injection and Disposal
(Book 3 in the Vocational Training Series)

A handbook for the planning, installation, operation, and maintenance of subsurface disposal systems. Design criteria and formulas are given for gathering systems, treating plants, and injection facilities. Alternative equipment and methods are discussed and illustrated. Economic considerations are presented. Pages: 47

3rd Edition | January 1995 | Reaffirmed: March 1, 2007
Product Number: GVT033 | Price: $94.00

Wireline Operations and Procedures
(Book 5 in the Vocational Training Series)

A handbook outlining to operators of oil and gas wells what applications are possible with wireline tools and equipment. Also a guide for field personnel. Surface equipment, service tools (standard and special), and subsurface equipment (both permanent and removable) are described and illustrated. Their various applications are included. Also presented is a general discussion of special problems which wireline operations and procedures may serve to eliminate, minimize, or control, and methods by which this may be accomplished. Pages: 60

3rd Edition | January 1994 | Reaffirmed: March 1, 2007
Product Number: GVT053 | Price: $118.00

Gas Lift
(Book 6 in the Vocational Training Series)

Familiarizes field personnel with basic gas lift principles; operating procedures for adjusting, regulating, operating, and troubleshooting gas-lift equipment; and well conditions. Covers conventional practices and concepts. Illustrated with drawings of typical gas-lift installations and related equipment, as well as actual charts illustrating operation of and problems encountered in gas-lifted wells. Pages: 143

3rd Edition | January 1994 | Reaffirmed: March 1, 2007
Product Number: GVT063 | Price: $152.00

RP T-1
Orientation Programs for Personnel Going Offshore for the First Time

Serves as a guide to developing orientation standards and programs applicable to all employees and visitors going offshore. Orientation programs ensure that all new personnel know what is expected of them during their first trip offshore, as well as what they may expect to encounter during this trip. Employers have the option to institute broader procedures commensurate with their own policies and standards. Pages: 4

4th Edition | October 1995 | Reaffirmed: March 1, 2007
Product Number: GT1004 | Price: $57.00

RP T-2 ◆
Qualification Programs for Offshore Production Personnel Who Work with Safety Devices

Provides guidelines for the qualification of personnel engaged in installing, inspecting, testing, and routinely maintaining surface and subsurface devices that are used to insure safety and to prevent pollution during the production of oil and gas on offshore platforms. The guidelines provide expected candidate performance levels, instructional content and recommendations for testing. The guidelines are divided into instructional and testing phases. Pages: 3

2nd Edition | December 2001 | Reaffirmed: March 1, 2007
Product Number: GT7002 | Price: $57.00

RP T-4
Training of Offshore Personnel in Nonoperating Emergencies

Represents an industry guide for the training of workers who work offshore. It presents recommendations for training these personnel in handling nonoperating emergencies, such as fires, transportation emergencies, platform abandonment procedures, use of survival crafts, and water survival guidelines. Pages: 3

2nd Edition | November 1995 | Reaffirmed: June 1, 2000
Product Number: GT4002 | Price: $57.00

RP T-6
Recommended Practice for Training and Qualification of Personnel in Well Control Equipment and Techniques for Wireline Operations on Offshore Locations

Provides criteria for the qualification of wireline personnel in well control equipment operations and techniques. Although it does include recommendations for training wireline personnel on general rig well control equipment and theory, it should be noted that the main focus for training should be those operations using a lubricator as the primary well control mechanism. Wireline personnel classifications to which this RP is applicable are the Helper/Assistant and Operator/Supervisor. Pages: 2

1st Edition | October 2002 | Reaffirmed: March 1, 2007
Product Number: GT0601 | Price: $57.00

RP T-7
Training of Personnel in Rescue of Person in Water

Applies to personnel who work offshore. It represents an industry guide for training personnel in techniques for rescuing persons from the water and using survival devices. It broadly identifies rescue devices, describes their operations, and presents recommendations for training personnel. Training recommendations are designed to develop personnel rescue proficiency while minimizing an individual's exposure to injury or loss of life. Pages: 8

2nd Edition | October 1995 | Reaffirmed: March 1, 2007
Product Number: GT7002 | Price: $55.00

API Upward Knowbility™

API University is dedicated to providing excellence in oil and natural gas industry training. We offer a wide variety of instructor-led courses developed and taught by the most knowledgeable industry experts. Whether you want a public course or a customized course at your facility, API University has training any way you want it, anywhere you want it.

Classroom Courses

Equipment, Design, Maintenance

TANKS

Introduction To 650 and 653 Aboveground Storage Tanks
www.api-u.org/introAST.html

This training program will provide a comprehensive introduction to API standards 650 and 653, highlighting the most recent revisions and upcoming changes. The attendees are introduced to API 620, a tank construction standard that deals with field built tanks that are primarily designed to be used with higher storage pressures and colder storage temperature.

Training on Aboveground FRP and Plastic Storage Tanks
www.api-u.org/PlasticAST.html

Many tank owners believe that since The EPA's SPCC Program makes little mention of the tank's "material of construction" then perhaps FRP and Plastic tanks are exempt from tank integrity inspection.

Training on the Inspection of Steel Aboveground Storage Tanks (ASTs)
www.api-u.org/steelAST.html

Many small tank owners believe that API 653 does not apply to their tanks and this is very unfortunate since using this standard to inspect their tanks may lead to longer "usable tank life." Many API 653 Certified Tank Inspectors have been using 653 to inspect small tanks and have saved their customers hundreds of dollars.

Safe Tank Entry Workshop
www.api-u.org/safe_tank_entry.html

Learn to enter and work safely in aboveground petroleum storage tanks in accordance with API 2015 and 2016 in the safe tank entry workshop offered by nfpa and the american petroleum institute. This 2-day, interactive seminar uses video, case studies, group discussions and hands-on activities to help you learn the proper practices and procedures.

INSPECTION OF REFINERY EQUIPMENT

Fitness-For-Service (FFS) based on API RP 579
www.api-u.org/ffs.html

The instructors, who are also the principal authors of RP 579, give their insights into the background and logic behind the assessment procedures. In addition, both courses include other highlights: discussion of damage mechanisms and the importance of identification; various detailed inspection techniques for damage mechanisms, with focus on flaw characterization (this is not covered in the 1 1/2-day course). Overview of remaining life assessment, remediation, and methods to extend the life of damaged equipment, Presentation of practical examples of FFS procedures, Details on how to assess damage/flaws that are not directly covered in API 579.

Risk-Based Inspection (RBI) based on API RP 580/581
www.api-u.org/rbi.html

Using semi-quantitative and quantitative approaches, the course covers technical content that is both broad and deep. Class discussions are an effective way for students to gain insights about the focus of various rbi methods and parameters to include in an effective analytical program.

Damage Mechanisms In Refining based on API RP 571
www.api-u.org/damage_mechanisms.html

This course, which Is taught by the primary authors of API's Recommended Practice 571, includes many special features: an overview of basic metallurgy applicable to refinery construction materials, a description of common refining processes on the process flow diagram level, highlighting where various damage mechanisms are usually observed, an analysis of typical nde methods and their ability to detect and characterize equipment damage, detailed discussions of the more than 60 damage mechanisms that are found in refineries covered by RP 571, examples of equipment damage and failures, as well as learning exercises for students.

PRESSURE RELIEVING SYSTEMS

Pressure Relieving Systems based on API RP 520/521
www.api-u.org/pressure_relief.html

API's 3-day course, taught by the Equity Engineering Group, Inc. provides real-world case studies about incidents involving pressure relief valves (prv). There also are classroom exercises that illustrate procedures for determining relief rates and valve size.

VALVES AND WELLHEAD EQUIPMENT

Overview of API Spec 6A
www.api-u.org/6A.html

API 6A has been revised in many significant ways. New products have been added to the scope; requirements have been changed. The specification is now primarily in the ISO metric system with traditional dimensions in parentheses or annexes. Additionally, the specification addresses the rules of the new NACE Standard, MR0175-2003.

Overview of API Specification 6D
www.api-u.org/6D.html

Each section of the current edition of Specification 6D is covered in detail, followed by a section-by-section coverage of API 6DSS highlighting the common requirements and the differences between the two specifications. The relationship of these specifications and ASME B16.34, Steel Valves, and API Specification 6A / ISO 10423, Wellhead and Christmas Tree Equipment, will be clarified.

SECURITY, SAFETY, REGULATIONS, QUALITY

Workshop on Industry Security Vulnerability Assessments (SVAs)
www.api-u.org/SVA.html

API presents the leading SVA training for the petroleum, petrochemical and chemical industries. The objective of an SVA is to identify security hazards, threats and vulnerabilities facing a facility and to evaluate the countermeasures to provide for the protection of the public, workers, national interests, the environment, and the company.

Workshop on USCG Regulations for Facility Security Officers (FSOs)
www.api-u.org/FSO.html

Learn about the requirements for Facility Security Officers released in the U.S. Coast Guard (USCG) Final Rule: Part 105, Subpart B. Course materials include a reference CD of over 30 helpful related documents including the regulation, NVICs, API's *Security Vulnerability Assessment for the Petroleum & Petrochemical Industries*, and numerous DHS bulletins.

API RP 752 and 753: Facility Siting Regulations and Compliance
www.api-u.org/FacilitySitingCompliance.html

This course is a management-level overview and addresses the regulatory requirements for facility siting, a review of API RP 752 and RP 753, and an overview of the methods to satisfy the requirements. Anyone managing, performing, or reviewing facility siting needs should attend.

Facility Siting Update: Process Plant Building Hazard Management
www.api-u.org/FacilitySitingUpdate.html

Learn what you need to do to respond to the new recommended practice on Location of Process Plant Portable Buildings. Learn what issues are being addressed in revising API RP 752 and what you will need to prepare for in response. The first day is a management overview; the second day is a more technical course designed for the process safety professional who is performing facility siting studies and requires each student to bring a calculator.

Facility Siting Consequence Analysis Techniques
www.api-u.org/FacilitySitingTechniques.html

This course is a continuation of the *API RP 752 and 753: Facility Siting Regulations and Compliance* course and is designed for the process safety professional performing facility siting studies. Topics covered will include a review of common methodologies to calculate blast loads and building damage for a facility siting study for both permanent and portable buildings. A significant portion of the course will be spent performing example calculations. Note: each student will need to bring a calculator.

API Specification Q1 Training for Quality Programs
www.api-u.org/Q1.html

In two information-packed days you'll get an overview of the requirements of API Spec Q1, what makes it so valuable, and why you need to know about these essential elements of the program.

PIPELINE

Oil and Gas Pipeline Fundamentals
www.api-u.org/PipelineFundamentals.html

This two day course; designed, produced, and taught by pipeline industry veteran Tom Miesner, former president of Conoco Pipe Line Company and author of Oil and Gas Pipelines in NonTechnical Language explains the industry and how pipelines work in straightforward language. “Limiting the use of equations while providing pictures, charts, graphs, and examples really made this course come alive for me,” said a recent class participant.

MECHANICAL EQUIPMENT

Rotor Repair based on API 687
www.api-u.org/rotorrepair.html

The API Rotor Repair Course, based on API Standard 687, covers the minimum requirements for the inspection and repair of rotating equipment rotors, bearings, and couplings used in the petroleum, chemical and gas industry services.

Specifying Reliable Cost Effective Machinery Designs
www.api-u.org/MechEquip.html

Take advantage of over 800 man years of expert experience in specifying, design, testing, installation and repair of rotating equipment by attending this new course covering the API Mechanical Equipment Standards. Learn the API mechanical equipment standard requirements, the reasons behind the requirements and how to knowledgably apply these specifications.

Executive Education

Presented by SMU-Cox

Developing a New Generation of Oil and Gas Leaders: Strategic Financial Skills
www.api-u.org/strategicfinancialskills.html

Hundreds of executives have chosen our Strategic Financial Skills program for its concentrated coverage of financial management techniques uniquely tailored to the complexities of their industry. This comprehensive weeklong program uses a hands-on approach to help you understand and master the energy sectorís financial essentials. Your instructors are senior teachers with significant experience in executive development, business, consulting and energy industry financial management. Youíll share ideas and discuss industry issues with participants from around the world in small discussion groups and lively classroom sessions. Youíll meet mid-level to senior-level professionals from many segments of the energy industry and a variety of functional areas within their companies. In a series of information-packed class sessions, you'll learn the essentials of the business side of the energy industry. By the end of the week, you'll have a working knowledge of the key areas of financial management.

Developing a New Generation of Oil and Gas Leaders: Strategic Leadership Skills
www.api-u.org/strategicleadershipskills.html

Research has shown that effective leaders have developed a pattern of success based on critical competencies that have been honed throughout their careers. In this program youíll be exposed to a highly creative faculty who will give you the tools to think and work differently as you move through the leadership roles and challenges of the oil and gas industry for the next decade.

Seminar for Senior Managers in the Oil and Gas Industry
www.api-u.org/seniormanagers.html

For more than 25 years, this high-powered seminar has brought together thousands of senior energy professionals from around the world to share ideas and strengthen their effectiveness with a broad-based business education. Your instructors are senior teachers with significant experience in executive development, business, consulting and energy industry practices. During the program, youíll explore both theory and practice and tackle key strategic, financial, leadership and operational issues. Youíll meet and share ideas with executives from around the world and have ample opportunities to network and make acquaintances. Much of your time will be spent discussing industry issuesóin small groups, in living classroom sessions, over meals and in recreational and social settings. The seminar is an intensive 10-day course of study that begins on Tuesday evening and concludes in the mid-afternoon on the second Thursday. This innovative format enables busy executives to participate without being out of the office for two full weeks.

E-Learning Courses

Presented and delivered by GP

ELECTRICAL MAINTENANCE

AC Curcuit Fundamentals
www.api-u.org/eLearning/ACCircuitFund.html

At the completion of this course, the student will be able to explain basic A.C. theory and describe the common connections used to build single-phase and three-phase A.C. circuits.

AC Curcuit Troubleshooting and Repair
www.api-u.org/eLearning/ACCircuitTroubleshooting.html

At the completion of this course, the student will be able to describe the basic steps for troubleshooting and repairing A.C. circuits.

Battery Chargers
www.api-u.org/eLearning/BatteryChargers.html

At the completion of this course, the student will be able to: describe the operational concepts associated with industrial battery chargers; explain the principles of rectifying A.C. power; describe the basic steps required for placing battery chargers in service; and describe the basic steps required for removing them from service.

Circuit Breakers—Low and Medium Voltage
www.api-u.org/eLearning/CuircuitBreakers.html

At the completion of this course, the student will be able to determine the current flow in a circuit, describe how to match overload devices with selected types of load, describe circuit breaker testing, and explain how to perform breaker contact inspections.

Control Devices
www.api-u.org/eLearning/ControlDevices.html

At the completion of this course, the student will be able to explain the function and operation of control device components, identify common electrical control device faults, and describe the basic steps for troubleshooting electrical control devices.

DC Circuit Fundamentals
www.api-u.org/eLearning/DCCircuitFund.html

At the completion of this course, the student will be familiar with electron theory as it relates to direct current (DC) electrical circuits. The student will be able to state Ohm's and Kirchoff's laws as they relate to DC circuits, determine circuit outputs from specified inputs in DC circuits, and be able to construct basic DC circuits.

DC Circuit Troubleshooting And Repair
www.api-u.org/eLearning/DCCircuitTroubleshooting.html

At the completion of this course, the student will be able to evaluate DC circuit performance, describe the major steps for troubleshooting DC circuits, and describe the major steps for performing repairs of DC circuits.

Freeze Protection
www.api-u.org/eLearning/FreezeProtection.html

At the completion of this course, the student will be able to describe: self-limiting (regulating) cables; constant wattage heating cables; and the concept of series resistance heating cables. The student will also be able to explain the use of heat transfer cement and tape, and describe how to troubleshoot, replace and repair freeze protection equipment.

Generator Basics
www.api-u.org/eLearning/GeneratorBasics.html

At the completion of this course, the student will be able to explain how A.C. generators produce A.C. voltage. The student will also be able to describe the operating characteristics of various types of generators, various generator applications, and the common types of generator construction.

Generator Maintenance
www.api-u.org/eLearning/GeneratorMaintenance.html

At the completion of this course, the student will be able to describe the basic steps required to perform internal cleaning, troubleshooting, disassembly and reassembly of generators.

Ground Detection
www.api-u.org/eLearning/GroundDetection.html

At the completion of this course, the student will be able to explain equipment grounding concepts, how to perform D.C. ground detection, how to use D.C. ground detection switches as supplied by a battery charger, and which D.C. breakers cannot be turned off during operation. The student will also be able to: identify unwanted circuit grounds; describe the process for eliminating ground faults; and describe the basic steps required for testing of proper equipment grounds.

Inverters
www.api-u.org/eLearning/Inverters.html

At the completion of this course, the student will be able to describe the operating principles of inverters and the function and operation of inverter components. The student will also be able to describe how to place inverters in service and remove them from service.

Limitorque Valves
www.api-u.org/eLearning/LimitorqueValves.html

At the completion of this course, the student will be able to explain how to stroke a Limitorque valve, describe common maintenance procedures on limit and torque switches, and describe the basic steps required to remove a Limitorque actuator from a valve.

Motor Basics
www.api-u.org/eLearning/MotorBasics.html

At the completion of this course, the student will be able to describe the basic types of motors and explain their operating characteristics.

Motor Maintenance
www.api-u.org/eLearning/MotorMain.html

At the completion of this course, the student will be able to describe basic steps for troubleshooting, cleaning, disassembling, and reassembling a motor, and performing operational checks when a motor is returned to service.

Prints and Drawings
www.api-u.org/eLearning/PrintsDrawings.html

At the completion of this course, the student will be able to describe the following types of drawings and diagrams: schematic, connection, logic, elementary, single-line, and P&ID.

Transformers
www.api-u.org/eLearning/Transformers.html

At the completion of this course, the student will be able to: describe transformer characteristics; list the essential parts of a simple transformer; state the relationship between primary and secondary voltages and transformer turns ratio; and define the terms potential transformer and current transformer. The student will also be able to: state the safety hazards related to transformers; describe transformer troubleshooting techniques; and be able to identify causes of transformer failure.

INDUSTRIAL MATH AND SCIENCE

Basic Math Operations
www.api-u.org/eLearning/BasicMathOperations.html

At the completion of this course, the student will be able to solve: arithmetic problems using addition, subtraction, multiplication, and division; and problems requiring conversion between decimals, fractions, and percentages. In addition, the student will be able to solve math problems requiring averages of a given number set, and problems with powers of ten notation.

Chemistry
www.api-u.org/eLearning/Chemistry.html

At the completion of this course, the student will be able to describe the fundamental principles of chemistry. The student will also be able to calculate the density of various materials and calculate specific gravity.

Geometry
www.api-u.org/eLearning/Geometry.html

At the completion of this course, the student will be able to: identify various geometric shapes and calculate their area; calculate the correct dimensions relating to the hypotenuse of a right triangle; and calculate the volume of various geometric shapes.

Tables And Graphs
www.api-u.org/eLearning/TablesGraphs.html

At the completion of this course, the student will be able to recognize and describe tables, charts, and graphs, and explain how to read the data represented by them.

INSTRUMENTATION AND CONTROL

Control Devices and Indicators
www.api-u.org/eLearning/ICControlDevicesIndicators.html

At the completion of this course, the student will be able to explain the terminology associated with controllers and control action. The student will also be able to describe the following: the operation of solenoid valves; the function of square root extractors; the operation and application of pressure regulators; the function of volume boosters; the operation of temperature and pressure switches; the function and operation of limit switches; the function of indicators and recorders; the basic types of final control actuators; and the basic types of valves. In addition, the student will be able to explain the basic steps used to troubleshoot and repair electronic control valves.

Digital Electronics
www.api-u.org/eLearning/DigitalElectronics.html

At the completion of this course, the student will be able to: describe the use of decimal, octal, binary, and hexadecimal numbering systems; explain the use of BCD and ASCII codes in digital electronic circuits; and describe positive and negative logic as related to digital electronic circuits. The student will also be able to determine the appropriate digital circuit outputs from specified inputs, and construct simple digital circuits. In addition, the student will be able to describe the basic steps for troubleshooting and repairing digital circuits.

Electronic Circuits
www.api-u.org/eLearning/ElectronicCircuits.html

At the completion of this course, the student will be able to explain the basic steps for constructing basic electronic circuits. The student will also be able to: identify the symptoms of defective operational amplifier circuits; determine the proper feedback circuits to achieve desired operational amplifier gain; and explain the basic steps for evaluating the performance of a power supply circuit. In addition, the student will be able to describe the proper techniques for soldering in electronic circuits.

Fire Protection Instrumentation
www.api-u.org/eLearning/FireProtectionInstrumentation.html

At the completion of this course, the student will be able to describe the instrumentation used in selected fire protection systems. In addition, the student will be able to describe the basic steps in troubleshooting and repair of selected fire protection instrumentation.

Fundamentals of Instrumentation and Control
www.api-u.org/eLearning/FundInstandControl.html

At the completion of this course, the student will be able to: define terminology associated with control instruments; describe block diagrams; distinguish between open and closed loop systems; and describe the function and operating characteristics of various sensing devices, transmitters, valve positioners, and final control elements.

Microprocessors
www.api-u.org/eLearning/Microprocessors.html

At the completion of this course, the student will be able to explain the purpose and function of the basic components of microprocessors. The student will be able to: describe the types and operation of memory circuits; explain the use of expansion buses and 8-bit buses used to interface microprocessors; and describe the theory of operation of microprocessor registers. In addition, the student will be able to describe the basic programming used by microprocessors and explain the basic steps for troubleshooting microprocessors.

PLCs
www.api-u.org/eLearning/PLCs.html

At the completion of this course, the student will be able to explain the functions, basic operation and applications of programmable logic controllers. The student will also be able to explain the meaning of PLC status indicator lights and the basic steps for troubleshooting PLCs. In addition, the student will be able to interpret and draft ladder logic with bit instructions.

Pneumatics—Controls
www.api-u.org/eLearning/PneumaticsControls.html

At the completion of this course, the student will be able to explain the operating characteristics of valve positioners and describe the basic steps required for calibrating and troubleshooting pneumatic control instruments. The student will be able to describe the operation of the Bailey Standatrol system and identify and state the function of the major components of Bailey pneumatic drives and positioners. In addition, the student will be able to describe: the basic steps required for removing meters from and returning meters to service; the basic steps required to disassemble, clean, and calibrate a Ledoux bell meter; and the basic steps required to disassemble, inspect, and set up inlet and exhaust valves on Standatrols. The student will also be able to explain the operating characteristics of I/P and P/I transducers and the basic steps required for calibrating transducers.

Pneumatics—Tubing
www.api-u.org/eLearning/PneumaticsTubing.html

At the completion of this course, the student will be able to describe the steps required to select the proper tubing and fittings for specific applications, taking pressure and chemical compatibility into consideration. The student will also be able describe the steps required to correctly install the following types of tubing fittings: soldered copper, copper compression, and sleeve. In addition, the student will be able to describe the steps required to flare tubing, the proper use of tubing benders, and the steps required to plan and install tubing supports and hangers.

Process Control and System Tuning
www.api-u.org/eLearning/ProcessControl.html

At the completion of this course, the student will be able to describe basic principles and types of process control and explain various methods of controller tuning.

Process Measurement
www.api-u.org/eLearning/ProcessMeasurement.html

At the completion of this course, the student will be able to explain the principles of pressure, temperature, level and flow measurement, describe the operation of devices that sense each process variable, and explain the basic steps for troubleshooting those devices.

Semiconductors
www.api-u.org/eLearning/Semiconductors.html

At the completion of this course, the student will be able to explain the purpose and function of the basic components of microprocessors. The student will be able to: describe the types and operation of memory circuits; explain the use of expansion buses and 8-bit buses used to interface microprocessors; and describe the theory of operation of microprocessor registers. In addition, the student will be able to describe the basic programming used by microprocessors and explain the basic steps for troubleshooting microprocessors.

Test Equipment and Calibration
www.api-u.org/eLearning/TestEquipCal.html

At the completion of this course, the student will be able to define basic instrumentation terms, identify various components in an instrumentation loop and explain their function. In addition, the student will be able to explain the use of multimeters, oscilloscopes, and portable power supplies. The student will also be able to describe the operation of temperature sensing devices and how to test them. Finally, the student will be able to explain the basic principles of calibration.

MECHANICAL MAINTENANCE

Air Compressors—Fundamentals
www.api-u.org/eLearning/AirCompressorsFund.html

At the completion of this course, the student will be able to describe the basic components and operation of common types of air compressors.

Air Compressors—Maintenance
www.api-u.org/eLearning/AirCompressorsMaint.html

At the completion of this course, the student will be able to describe the major steps in disassembling, inspecting, replacing defective parts, and reassembling air compressors.

Air Compressors—Positive Displacement—Overhauls
www.api-u.org/eLearning/AirCompressorsPosDisplacement.html

At the completion of this course, the student will be able to: describe the major steps involved in overhauling multi-stage piston air compressors; describe the basic construction and operation of wet and dry screw compressors; and describe the major steps involved in overhauling screw type air compressors.

Bearing Fundamentals
www.api-u.org/eLearning/BearingFund.html

At the completion of this course, the student will be able to describe bearing types, components and operating characteristics.

Bearing Lubrication
www.api-u.org/eLearning/BearingLub.html

At the completion of this course, the student will be able to explain types and uses of lubricants, and describe proper lubrication techniques for various bearings.

Bearing Maintenance
www.api-u.org/eLearning/BearingMain.html

At the completion of this course, the student will be able to describe the major steps in the removal, inspection, repair, replacement, and installation of sliding surface and rolling contact bearings.

Drive Belts
www.api-u.org/eLearning/DriveBelts.html

At the completion of this course, the student will be able to: identify drive belts used in the plant; describe the use of drive belts; identify sheaves used in the plant; describe the major steps required to perform drive belt adjustments; and describe the major steps required to replace drive belts.

Gaskets and O-Rings
www.api-u.org/eLearning/Gaskets.html

At the completion of this course, the student will be able to describe how to make gaskets and O-rings. In addition, the student will be able to explain how to remove, select, and install O-rings, gaskets, and packing.

Heat Exchanger Fundamentals
www.api-u.org/eLearning/HeatExchangerFund.html

At the completion of this course, the student will be able to explain the theory of how heat exchangers transfer heat, list common types of heat exchangers, and describe heat exchanger design characteristics.

Heat Exchanger Maintenance
www.api-u.org/eLearning/HeatExchangerMain.html

At the completion of this course, the student will be able to describe: the effects of fouling, corrosion, and erosion commonly found in heat exchangers; common techniques used to clean heat exchangers; basic steps used to inspect heat exchangers; steps used in performing common leak tests; and basic steps used to perform repairs.

Hydraulics—Fundamentals
www.api-u.org/eLearning/HydraulicsFund.html

At the completion of this course, the student will be able to: explain the basic principles of hydraulics; describe the major components common to most fluid power systems; and identify common hydraulic component symbols found on a hydraulic fluid flow diagram. In addition, the student will be able to identify fluids and additives used in hydraulic systems and describe their characteristics.

Hydraulics—Maintenance
www.api-u.org/eLearning/HydraulicsMain.html

At the completion of this course, the student will be able to: identify fluid power system problems and remedies; locate various components of a fluid power system; explain the types of repairs made to selected fluid power system components; describe the major steps required in the replacement of parts and components in fluid power systems; and explain basic fluid power system routine maintenance activities.

Machine Shop—Grinders, Saws And Drills
www.api-u.org/eLearning/Grinders.html

At the completion of this course, the student will be able to describe the procedure for dressing and truing a grinding wheel on a pedestal grinder and explain the proper use of a surface grinder. The student will also be able to describe the proper procedure to saw to layout lines using a band saw. In addition, the student will be able to: describe the major steps required to drill, countersink, counterbore, spotface, ream and tap holes on a drill press; and identify tap types and the different classifications of threads used for fasteners.

Machine Shop—Lathes
www.api-u.org/eLearning/Lathes.html

At the completion of this course, the student will be able to explain the function and proper use of the basic components of an engine lathe and its controls. The student will also be able to describe the steps required to: perform precision centering work; face the end surfaces and shoulders of a work specimen; perform drilling in a lathe; carry out straight and taper turning; cut steep tapers and chamfers; perform radius and fillet turning; mount, face and turn work on a mandrel; execute machine reaming; do parting and grooving; perform boring operations; knurl a work piece; cut internal and external unified standard screw threads; straighten a shaft; and grind radius, turning, facing, form, and threading tools.

Machine Shop - Layout/Bench Work
www.api-u.org/eLearning/LayoutBenchWork.html

At the completion of this course, the student will be able to perform a rough and a precision layout of a workpiece. The student will also be able to describe: how to saw stock with a hand hacksaw; the correct procedure for straight and draw filling of metal; how to size holes with a hand reamer; and hand methods of deburring parts, removing broken studs, tapping threads, and cutting threads using a threading die and tap. In addition, the student will be able to describe: how to cut threads by machine using a threading die; the procedure for broaching a keyway using an arbor press; and how to operate a powered keyway cutter.

Machine Shop—Vertical Milling Machines
www.api-u.org/eLearning/VerticalMilling.html

At the completion of this course, the student will be able to describe the basic components, controls, and operation of a vertical milling machine. The student will be able to describe the steps required to: locate, drill, bore and ream holes using the coordinated method; step drill holes accurately; mill a slot or pocket; counter sink, counter bore, and spot face work pieces; mill a square and hexagon on a work piece; machine a flat surface using a flying cutter; mill multi-level surfaces; and mill a fillet with a ball end mill.

Oil Analysis
www.api-u.org/eLearning/OilAnalysis.html

At the completion of this course, the student will be able to explain the basic principles of lubrication, including oil and grease characteristics, lubricant additives, lubricant selection, and lubricant storage and handling. The student will also be able to explain the fundamentals of lubrication sampling and the basic methods of maintaining oil and grease lubricated systems. In addition, the student will be able to: describe general lubricant problems and explain the basic principles of lubricant testing and analysis.

Piping
www.api-u.org/eLearning/Piping.html

At the completion of this course, the student will be able to identify and describe various pipe fittings, common pipe joining methods, and different types of pipe hangers and support systems. Students will also be able to identify piping symbols on piping and instrumentation drawings.

Precision Measurement
www.api-u.org/eLearning/PrecisionMeasurement.html

At the completion of this course, the student will be able to describe how to use the following measurement tools: steel rules, protractors, outside micrometers, inside micrometers, telescoping gauges, depth rules, depth micrometers, hole gauges, Vernier calipers, dial indicators, dial calipers, radius gauges, thickness gauges, taper gauges, wire gauges, sheet metal gauges, screw pitch gauges, thread micrometers, and go/no go gauges.

Pumps—Centrifugal—Fundamentals
www.api-u.org/eLearning/PumpsCentFund.html

At the completion of this course, the student will be able to describe basic centrifugal pump components and operation, including performance issues pertaining to centrifugal pumps.

Pumps—Centrifugal—Maintenance
www.api-u.org/eLearning/PumpsCentMain.html

At the completion of this course, the student will be able to describe the major steps required to disassemble, inspect, and reassemble centrifugal pumps.

Pumps—Centrifugal—Overhauls
www.api-u.org/eLearning/PumpsCentrifugalOverhauls.html

At the completion of this course, the student will be able to describe: the major steps required to overhaul horizontal single-stage centrifugal pumps; horizontal multi-stage centrifugal pumps; vertical single-stage centrifugal pumps; and vertical multi-stage centrifugal pumps.

Pumps—Positive Displacement—Fundamentals
www.api-u.org/eLearning/PumpsPosDisplacementFund.html

At the completion of this course, the student will be able to: explain the basic theory of operation of centrifugal and positive displacement pumps; list the major safety devices associated with positive displacement pumps; and list common applications for positive displacement pumps.

Pumps—Positive Displacement—Overhauls
www.api-u.org/eLearning/PumpsPosDisplacementOverhauls.html

At the completion of this course, the student will be able to describe the major steps involved in disassembling, inspecting and reassembling screw type positive displacement pumps and identify parts that are commonly replaced. The student will also be able to describe the major steps involved in overhauling gear, piston, diaphragm, lobe, vane, and liquid ring pumps.

Rigging and Lifting Practices
www.api-u.org/eLearning/RiggingLifting.html

At the completion of this course, the student will be able to describe common types of rigging and lifting equipment, and explain how to use the equipment safely. In addition to rigging equipment, the following are covered: manual lifting devices, electric powered lifting devices, air operated lifting devices, hydraulic lifting devices, mobile cranes, and boom trucks.

Scaffolds
www.api-u.org/eLearning/Scaffolds.html

At the completion of this course, the student will be able to: describe the most common types of scaffolds; describe the proper and safe use of scaffolding; and explain the major steps required to assemble and disassemble scaffolding and stays.

Shaft Alignment – Laser Aided
www.api-u.org/eLearning/ShaftAlignmentLaserAided.html

At the completion of this course, the student will be able to: describe the major types and functions of couplings; explain the basic terminology and principles of shaft alignment; and describe soft foot, the conditions that can cause it, as well as how to correct soft foot using a laser-based alignment system. In addition, the student will be able to explain the operation of a laser-based alignment system and how to troubleshoot some laser alignment problems.

Tools
www.api-u.org/eLearning/Tools.html

At the completion of this course, the student will be able to: identify common types of hand and power tools, and describe safety precautions associated with them. The student will also be able to identify common types of measuring tools and describe their uses. In addition, the student will be able to identify common types of fasteners, describe basic specification issues, and explain basic fastener usage and safety considerations.

Valve Fundamentals
www.api-u.org/eLearning/ValveFund.html

At the completion of this course, the student will be able to describe the major types of valves used in plants, their components, and their operating characteristics.

Valve Maintenance
www.api-u.org/eLearning/ValveMain.html

At the completion of this course, the student will be able to describe the major steps required in repairing valves and the basic steps in overhauling globe, gate, safety, relief, ball, plug, diaphragm, butterfly, check and control valves.

Welding—Arc
www.api-u.org/eLearning/WeldingArc.html

At the completion of this course, the student will be able to explain how to perform shielded metal arc welding on carbon steel plate and carbon steel pipe. The student will also be able to explain what the various welding positions are, their orientations, and the processes for welding in various positions. In addition, the student will be able to: explain the proper usage of polarities (D.C. power) and current flow in electric arc welding with covered electrodes; demonstrate the setup of electric arc welding equipment for S.M.A.W. welding in both polarities on steel plate; match electric arc welding filler metals to their application positions; and explain the setup of gas tungsten arc welding equipment for straight polarity welding with argon shielding gas.

Welding—Oxyacetylene
www.api-u.org/eLearning/WeldingOxyacetylene.html

At the completion of this course, the student will be able to explain the proper setup for oxyacetylene cutting equipment, demonstrate safe usage of oxyacetylene cutting equipment, and explain how to perform oxyacetylene cutting. The student will also be able to describe how to match filler metal requirements to base metals for fusion welding and explain how to perform oxyacetylene fusion welding on carbon steel. In addition, the student will also be able to explain how to perform oxyacetylene brazing on various metal alloys and describe how to braze weld various joint configurations.

Pipeline Operations

The American Petroleum Institute (API) and the National Center for Construction Education and Research (NCCER) have joined forces to create the Pipeline Training and Assessment Program (PTAP). The API Operator Qualification (OQ) Pipeline Training and Assessment Program (PTAP) consists of API Operator Qualification (OQ) Pipeline Curriculum and Skills Assessments to qualify pipeline personnel under the Department of Transportation's (DOT) regulation for Pipeline Operator Qualification (OQ). The Pipeline Skills Assessments link to Pipeline OQ Curriculum to help determine operator qualifications on selected Covered Tasks as identified by API and the Pipeline Industry.

The seven categories of the API OQ Pipeline curriculum are:

- Gas Pipeline Operations
- Liquid Pipeline Field Operations
- Liquid Pipeline Control Center Operations
- Pipeline Corrosion Control Levels One and Two
- Pipeline Electrical & Instrumentation Levels One through Three
- Pipeline Maintenance Levels One through Three
- Pipeline Mechanical Levels One through Three

Please note that each Level One curriculum begins with the same module: Introduction to the Pipeline Industry. As well, all Level One curricula contain an Abnormal Operating Conditions module. Also note that the Module titles are aligned with their coinciding Covered Tasks (CT) where applicable.

For more information regarding the API OQ Curriculum and Skills Assessments visit www.nccer.org or call NCCER's Customer Service at 1-888-NCCER20. For information on placing NCCER Pipeline Curriculum orders, visit www.crafttraining.com, or call Prentice Hall Customer Service at 1-800-922-0579.

CORE CURRICULUM

The API OQ Core Curriculum is the foundation for all construction, maintenance, and pipeline skills. NCCER strongly recommends that trainees successfully complete Core Curriculum before advancing to Level One of their chosen field. Thus, ordering information for the Core Curriculum (72.5 hours of training) is listed at the beginning of each of API OQ PTAP seven categories below.

Published: 1992 | Revised 2004

GAS PIPELINE OPERATIONS

197.5 Hours (includes 72.5 hours of Core Curriculum) | Published: 2002

CORE CURRICULUM

PERFECT-BOUND
Trainee Guide: $40.00 ISBN 0-13-109187-5
Annotated Instructor's Guide: $40.00 ISBN 0-13-109191-3
LOOSE-LEAF
Trainee Guide: $40.00 ISBN 0-13-109188-3
Annotated Instructor's Guide: $40.00 ISBN 0-13-109192-1
HARD-COVER
Trainee Guide: $45.00 ISBN 0-13-109189-1

Gas Pipeline Operations—PERFECT-BOUND

Includes all modules below

Trainee Guide: $100.00 ISBN 0-13-046671-9
Annotated Instructor's Guide: $100.00 ISBN 0-13-046672-7

MODULES

The following ISBN and pricing information is for ordering individual modules.

66101-02 Introduction to the Pipeline Industry

(*Pipeline Core*) (15 Hours) Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.

Trainee $20.00 ISBN 0-13-038223-X
Instructor $20.00 ISBN 0-13-038234-5

67102-02 Basic Pipeline Pneumatics and Equipment

(10 Hours) Introduces the basics of pneumatic equipment. Topics include pneumatic safety and the physical characteristics of gas. A discussion of compressors, valves, meters, and other pipeline equipment and an overview on pipeline design also are included.

Trainee $20.00 ISBN 0-13-038244-2
Instructor $20.00 ISBN 0-13-038251-5

67103-02 Pipeline Communications

(10 Hours) Stresses the importance of clear communication between pipeline employees. Topics include issuing work orders and callouts, communications between shifts, and communications with regulatory agencies and the general public. Focuses on the importance of communication to safety, customer service, and the company's reputation.

Trainee $20.00 ISBN 0-13-038245-0
Instructor $20.00 ISBN 0-13-038252-3

67104-02 Routine Field and Facility Operations

(*CT 43, 50, 51, 54, 56, 57, and 58*) (30 Hours) Provides an overview of the daily tasks performed in the field and the pipeline facility. Topics include performing routine facility inspections, operating valves and compressors, purging the pipeline, testing remote control shutdown devices, operating odorant equipment and monitoring odorant level (when applicable), uprating the pipeline MAOP, performing system startup and shutdown, and pigging.

Trainee $20.00 ISBN 0-13-038247-7
Instructor $20.00 ISBN 0-13-038254-X

67105-02 Routine Control Center Operations

(*CT 43, 50, 51, 54, 56, 57, and 58*) (30 Hours) Provides an overview of the daily tasks performed in a pipeline's control center, including the use of the SCADA system. Topics include manifold and compressor operations, system startup and shutdown, pigging, purging pipelines, testing remote control shutdown devices, uprating the MAOP, and operating odorant equipment and monitoring odorant level (when applicable).

Trainee $20.00 ISBN 0-13-038246-9
Instructor $20.00 ISBN 0-13-038253-1

67106-02 Quality Control and Measurement

(20 Hours) Focuses on the importance of quality control and accurate measurement as they affect safety, customer service, and the company's reputation. Topics include taking samples, performing product testing, and product testing and measurement tools.

Trainee $20.00 ISBN 0-13-038240-X
Instructor $20.00 ISBN 0-13-038257-4

67107-02 Abnormal Operating Conditions

(10 Hours) Provides an overview of the types of abnormal operating conditions (AOCs) that may occur on the pipeline or in company facilities. Appropriate responses to AOCs are covered with a focus on following company policy to protect lives and pipeline equipment. Also covered are the reports required by federal law.

Trainee $20.00 ISBN 0-13-038265-5
Instructor $20.00 ISBN 0-13-038275-2

LIQUID PIPELINE FIELD OPERATIONS

195 Hours (includes 72. 5 hours of Core Curriculum) | Published 2002

CORE CURRICULUM

PERFECT-BOUND
Trainee Guide: $40.00 ISBN 0-13-109187-5
Annotated Instructor's Guide: $40.00 ISBN 0-13-109191-3
LOOSE-LEAF
Trainee Guide: $40.00 ISBN 0-13-109188-3
Annotated Instructor's Guide: $40.00 ISBN 0-13-109192-1
HARD-COVER
Trainee Guide: $45.00 ISBN 0-13-109189-1

Liquid Pipeline Field Operations—PERFECT-BOUND
Includes all modules below
Trainee Guide: $100.00 ISBN 0-13-046669-7
Annotated Instructor's Guide: $100.00 ISBN 0-13-046660-3

MODULES

The following ISBN and pricing information is for ordering individual modules.

66101-02 Introduction to the Pipeline Industry

(*Pipeline Core*) (15 Hours) Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.
Trainee $20.00 ISBN 0-13-038223-X
Instructor $20.00 ISBN 0-13-038234-5

66102-02 Liquid Pipeline General Abnormal Operating Conditions

(*Pipeline Core*) (5 Hours) Introduces the Abnormal Operating Conditions (AOCs) that can occur on a pipeline or in a pipeline facility. Includes general procedures on how to recognize and react to AOCs and the necessary documentation and notifications that must be completed when responding to AOCs.
Trainee $20.00 ISBN 0-13-038224-8
Instructor $20.00 ISBN 0-13-038235-3

60102-02 Basic Pipeline Hydraulics and Equipment

(10 Hours) Explains pipeline hydraulics safety, basic principles of hydraulic systems, hydraulic properties of petroleum products, pipeline design factors, and basic pipeline equipment.
Trainee $20.00 ISBN 0-13-038226-4
Instructor $20.00 ISBN 0-13-038236-1

60103-02 Pipeline Communications

(7.5 Hours) Introduces the various channels of communications that must exist in pipeline operations, including internal communications with scheduling, operations, and maintenance, and external communications with contractors, the general public, regulatory agencies, and local, state, and federal government.
Trainee $20.00 ISBN 0-13-038227-2
Instructor $20.00 ISBN 0-13-038237-X

60104-02 Product Batch and Pig Tracking

(10 Hours) Describes how to track pipeline product line inventories; handle scheduled pipeline shipments; identify product interface changes; and launch, receive, and track pigs through the pipeline and facility.
Trainee $20.00 ISBN 0-13-038228-0
Instructor $20.00 ISBN 0-13-038238-8

60105-02 Routine Field and Facility Operations

(*CT 43.1, 43.2, and 43.4*) (25 Hours) Explains how to perform visual facility checks and verify tank capacity and availability. Provides procedures for operating valves; facility pumping equipment; pressure, flow, and temperature controllers; and terminal storage tanks. Also provides information relating to custody transfers, setting alarm parameters, performing start-up and shutdown procedures, performing batch switches, calculating facility over-and-short, and completing required operations documentation.
Trainee $20.00 ISBN 0-13-038229-9
Instructor $20.00 ISBN 0-13-038239-6

60106-02 Monitoring Pipeline Operations

(*CT 43.3*) (15 Hours) Explains how to monitor pipeline parameters, recognize and react to safety device alarms, purge product from the pipe, perform pipeline surveillance, and monitor weather conditions.
Trainee $20.00 ISBN 0-13-038220-5
Instructor $20.00 ISBN 0-13-038230-2

60107-02 Field Quality Control

(15 Hours) Introduces field quality control procedures including activation of tank mixing devices, collection of product samples, product testing, pipeline switching, product blending operations, and injection of appropriate additives.
Trainee $20.00 ISBN 0-13-038231-0
Instructor $20.00 ISBN 0-13-038242-6

60108-02 Field Measurement

(20 Hours) Introduces the techniques used in field measurement of products in the pipeline. Areas covered include measurement components, types of meters, measurement of custody transfers and receipts, verification of meter accuracy, waterdraw calibration techniques, and utilization of tank strappings.
Trainee $20.00 ISBN 0-13-038232-9
Instructor $20.00 ISBN 0-13-038243-4

LIQUID PIPELINE CONTROL CENTER OPERATIONS

195 Hours (includes 72.5 hours of Core Curriculum) | Published 2002

CORE CURRICULUM

PERFECT-BOUND
Trainee Guide: $40.00 ISBN 0-13-109187-5
Annotated Instructor's Guide: $40.00 ISBN 0-13-109191-3
LOOSE-LEAF
Trainee Guide: $40.00 ISBN 0-13-109188-3
Annotated Instructor's Guide: $40.00 ISBN 0-13-109192-1
HARD-COVER
Trainee Guide: $45.00 ISBN 0-13-109189-1

Liquid Pipeline Control Center Operations—
PERFECT-BOUND—Includes all modules below
Trainee Guide: $100.00 ISBN 0-13-046674-3
Annotated Instructor's Guide: $100.00 ISBN 0-13-046675-1

MODULES

The following ISBN and pricing information is for ordering individual modules.

66101-02 Introduction to the Pipeline Industry

(*Pipeline Core*) (15 Hours) Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.
Trainee $20.00 ISBN 0-13-038223-X
Instructor $20.00 ISBN 0-13-038234-5

65102-02 Control Center Abnormal Operating Conditions

(5 Hours) Introduces the trainee to the abnormal operating conditions that can occur on a pipeline or in a pipeline facility. Includes general procedures on how to recognize and react to abnormal operating conditions from the control center and the necessary documentation and notifications that must be completed when responding to abnormal operating conditions.

Trainee $20.00 ISBN 0-13-038267-1
Instructor $20.00 ISBN 0-13-038276-0

65103-02 Basic Pipeline Hydraulics and Equipment

(10 Hours) Explains pipeline hydraulics safety, basic principles of hydraulic systems, hydraulic properties of petroleum products, pipeline design factors, and basic pipeline equipment.

Trainee $20.00 ISBN 0-13-038259-0
Instructor $20.00 ISBN 0-13-038268-X

65104-02 Pipeline Communications

(7.5 Hours) Introduces the various channels of communication that must exist in pipeline operations, including internal communications with scheduling, operations, and maintenance, and external communications with contractors, the general public, regulatory agencies, and local, state, and federal government.

Trainee $20.00 ISBN 0-13-038261-2
Instructor $20.00 ISBN 0-13-038260-4

65105-02 Monitoring Pipeline Operations—Control Center

(*CT 43.3*) (30 Hours) Introduces the concepts, theories, and applications of the SCADA computer system. Explains how to monitor and prioritize the various alarms and functionalities of the SCADA system, perform pipeline system and pipeline station monitoring activities with the SCADA system, and document pipeline activities with the SCADA system.

Trainee $20.00 ISBN 0-13-038262-0
Instructor $20.00 ISBN 0-13-038271-X

65106-02 Routine Control Center Operations

(*CT 43.1, 43.2, and 43.4*) (35 Hours) Introduces the theories, concepts, and operation of tanks and explains how to perform pump and manifold operations. Also explains how to start up and shut down a pipeline system through the control center.

Trainee $20.00 ISBN 0-13-038263-9
Instructor $20.00 ISBN 0-13-038272-8

65107-02 Liquid Pipeline Measurement and Quality Control

(20 Hours) Explains how to activate tank mixing devices, perform product testing, and perform pipeline grade changes and tank capacity operations. Also explains how to use and inject appropriate additives, identify types of meters, maintain accurate measurement on all custody receipts, and the processes and techniques used to prove meters.

Trainee $20.00 ISBN 0-13-038264-7
Instructor $20.00 ISBN 0-13-038273-6

PIPELINE CORROSION CONTROL LEVEL ONE

160 Hours (includes 72.5 hours of Core Curriculum) | Published 2002

CORE CURRICULUM

PERFECT-BOUND
Trainee Guide: $40.00 ISBN 0-13-109187-5
Annotated Instructor's Guide: $40.00 ISBN 0-13-109191-3
LOOSE-LEAF
Trainee Guide: $40.00 ISBN 0-13-109188-3
Annotated Instructor's Guide: $40.00 ISBN 0-13-109192-1
HARD-COVER
Trainee Guide: $45.00 ISBN 0-13-109189-1

Pipeline Corrosion Control Level One—PERFECT-BOUND

Includes all modules below

Trainee Guide: $100.00 ISBN 0-13-046684-0
Annotated Instructor's Guide: $100.00 ISBN 0-13-046685-9

MODULES

The following ISBN and pricing information is for ordering individual modules.

66101-02 Introduction to the Pipeline Industry

(*Pipeline Core*) (15 Hours) Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.

Trainee $20.00 ISBN 0-13-038223-X
Instructor $20.00 ISBN 0-13-038234-5

66102-02 Liquid Pipeline General Abnormal Operating Conditions

(*Pipeline Core*) (5 Hours) Introduces the Abnormal Operating Conditions (AOCs) that can occur on a pipeline or in a pipeline facility. Includes general procedures on how to recognize and react to AOCs and the necessary documentation and notifications that must be completed when responding to AOCs.

Trainee $20.00 ISBN 0-13-038224-8
Instructor $20.00 ISBN 0-13-038235-3

61103-02 Locating Pipeline and Cable

(*CT 14.1 and 17.1*) (5 Hours) Identifies and explains One-Call notification systems and the methods used to locate pipe and cable. Also discusses the requirements for separations between underground structures, abnormal operating conditions (AOCs), and first responders.

Trainee $20.00 ISBN 0-13-038277-9
Instructor $20.00 ISBN 0-13-038287-6

61104-02 Measure Pit Depth and Wall Thickness

(*CT 8.1, 8.2, and 8.3*) (5 Hours) Explains how to use pit gauges to check pit depth, length, and profile. Describes how to take multiple readings for RSTRENG data and how to use ultrasonic meters to check pipewall thickness.

Trainee $20.00 ISBN 0-13-038278-7
Instructor $20.00 ISBN 0-13-038288-4

61105-02 Inspect Buried and Submerged Pipe When Exposed

(*CT 5.1, 5.2, and 5.3*) (5 Hours) Identifies and explains types of pipe coatings. Describes the different causes of coating damage. Covers inspecting pipe for corrosion and mechanical damage.

Trainee $20.00 ISBN 0-13-038279-5
Instructor $20.00 ISBN 0-13-038289-2

61106-02 Aboveground Pipe Coating and Inspection

(*CT 7.1, 7.2, 7.3, 7.5, 13.1, and 13.2*) (15 Hours) Describes aboveground pipe coating types and the causes of coating damage. Describes how to visually inspect aboveground pipe. Explains how to perform surface preparation and coating application for aboveground pipe.

Trainee $20.00 ISBN 0-13-038270-1
Instructor $20.00 ISBN 0-13-038280-9

61107-02 Apply and Repair External Coatings on Buried and Submerged Pipe

(*CT 13.1 and 13.*4) (10 Hours) Identifies and explains the desired qualities of buried pipe coatings. Explains surface preparation and coating application for buried/submerged pipe. Describes performing field coating repairs.

Trainee $20.00 ISBN 0-13-038281-7
Instructor $20.00 ISBN 0-13-038291-4

61108-02 Cathodic Protection Measurement

(*CT 1.1, 1.4, 1.5, 3.1, and 3.2*) (7.5 Hours) Explains the basic theory of cathodic protection and the methods used to provide protection. Describes the instrumentation and meters used in cathodic protection. Identifies and explains half cell inspection and measuring structure to soil potential.

Trainee $20.00 ISBN 0-13-038283-3
Instructor $20.00 ISBN 0-13-038292-2

61109-02 Test Station Repair

(*CT 2.1, 2.2, 2.3, and 2.4*) (5 Hours) Identifies and explains the types and construction of test stations. Describes how to repair aboveground and belowground test stations. Explains the methods used to attach test station wires to the pipe.

Trainee $20.00 ISBN 0-13-038284-1
Instructor $20.00 ISBN 0-13-038293-0

61110-02 Inspect Internal Pipe Surfaces

(*CT 12*) (7.5 Hours) Describes using ultrasonic gauges to check pipe wall thickness and pit gauges to check pit dimensions. Discusses how to establish pipe orientation and document the findings from wall thickness and pit dimension checks.

Trainee $20.00 ISBN 0-13-038285-X
Instructor $20.00 ISBN 0-13-038294-9

61111-02 Internal Corrosion Control

(*CT 10.1, 10.2, and 11*) (7.5 Hours) Explains how corrosion monitoring probes operate and the information that is collected. Describes using corrosion measurement tools and accurately recording the measurements obtained.

Trainee $20.00 ISBN 0-13-038286-8
Instructor $20.00 ISBN 0-13-038295-7

PIPELINE CORROSION CONTROL LEVEL TWO

Hours: 120 | Published 2002

Pipeline Corrosion Control Level Two—PERFECT-BOUND
Includes all modules below

Trainee Guide: $100.00 ISBN 0-13-046686-7
Annotated Instructor's Guide: $100.00 ISBN 0-13-046687-5

MODULES

The following ISBN and pricing information is for ordering individual modules.

61201-02 Install Cathodic Protection Systems

(*CT 9.2, 9.3, and 9.4*) (15 Hours) Describes requirements for planning a CP system, explains how to select components, and describes installation techniques for galvanic and impressed current systems. Includes rectifier installation.

Trainee $20.00 ISBN 0-13-038296-5
Instructor $20.00 ISBN 0-13-038302-3

61202-02 Maintain and Repair Rectifiers

(*CT 4*) (15 Hours) Describes the characteristics of CP rectifiers and the functions of rectifier components. Describes troubleshooting techniques for rectifiers and bonds, as well as repair and adjustment procedures for rectifiers.

Trainee $20.00 ISBN 0-13-038297-3
Instructor $20.00 ISBN 0-13-038303-1

61203-02 Mitigate Interference

(*CT 1.3 and 9.1*) (15 Hours) Identifies the sources of interference current in a CP system, including causes and testing. Describes mitigation and reduction techniques for a CP system, including bonds, coating, galvanic anodes, and electrical shields.

Trainee $20.00 ISBN 0-13-038298-1
Instructor $20.00 ISBN 0-13-038304-X

61204-02 Test and Repair Shorted Casings

(*CT 9.5*) (15 Hours) Explains testing casings, including causes of shorted casings, how to recognize them, and various tests for shorted casings condition. Explains the repair of shorted casings, including replacing components.

Trainee $20.00 ISBN 0-13-038299-X
Instructor $20.00 ISBN 0-13-038305-8

61205-02 Conduct Close Interval Survey

(*CT 1.2 and 1.4*) (15 Hours) Identifies common close interval survey equipment, including test lead reels, current interrupters, and data logger and reference electrodes. Describes continuous and interrupted close interval survey methods and the procedure for performing such a survey.

Trainee $20.00 ISBN 0-13-038301-5
Instructor $20.00 ISBN 0-13-038306-6

61206-02 Performing Coating Inspection

(*CT 7.7*) (15 Hours) Describes required pre-inspection activities, including surface preparation, degree of cleanliness, profile, and coating mixing, thickness, adhesion, and curing. Describes holiday and pinhole testing and causes of coating failures, including application problems, specifications, and diagnosis.

Trainee $20.00 ISBN 0-13-038248-5
Instructor $20.00 ISBN 0-13-038255-8

61207-02 Perform High-Pressure Blasting/Surface Preparation

(*CT 7.4 and 13.3*) (15 Hours) Explains basic abrasive blast system equipment and describes the characteristics of blast cleaning media. Explains preparation standards, including profiling and inspections. Describes chemical strippers.

Trainee $20.00 ISBN 0-13-038249-3
Instructor $20.00 ISBN 0-13-038256-6

61208-02 Apply Coatings Using Spray Applications

(*CT 7.6 and 13.5*) Describes types of paint and coating materials, including pigments, resins, solvents, and additives, including film-forming and generic coatings and powder coatings. Explains surface preparation, application, and testing. Describes air, electrostatic, and thermal spray systems.

Trainee $20.00 ISBN 0-13-038250-7
Instructor $20.00 ISBN 0-13-038269-8

PIPELINE ELECTRICAL & INSTRUMENTATION LEVEL ONE

287.5 Hours (includes 72.5 hours of Core Curriculum) | Published 2002

CORE CURRICULUM

PERFECT-BOUND
Trainee Guide: $40.00 ISBN 0-13-109187-5
Annotated Instructor's Guide: $40.00 ISBN 0-13-109191-3
LOOSE-LEAF
Trainee Guide: $40.00 ISBN 0-13-109188-3
Annotated Instructor's Guide: $40.00 ISBN 0-13-109192-1
HARD-COVER
Trainee Guide: $45.00 ISBN 0-13-109189-1

Pipeline Electrical & Instrumentation Level One—PERFECT-BOUND—Includes all modules below

Trainee Guide: $100.00 ISBN 0-13-046688-3
Annotated Instructor's Guide: $100.00 ISBN 0-13-046689-1

MODULES

The following ISBN and pricing information is for ordering individual modules.

66101-02 Introduction to the Pipeline Industry

(*Pipeline Core*) (15 Hours) Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.

Trainee $20.00 ISBN 0-13-038223-X
Instructor $20.00 ISBN 0-13-038234-5

66102-02 Liquid Pipeline General Abnormal Operating Conditions

(*Pipeline Core*) (5 Hours) Introduces the Abnormal Operating Conditions (AOCs) that can occur on a pipeline or in a pipeline facility. Includes general procedures on how to recognize and react to AOCs and the necessary documentation and notifications that must be completed when responding to AOCs.

Trainee $20.00 ISBN 0-13-038224-8
Instructor $20.00 ISBN 0-13-038235-3

64102-02 Pipeline E&I Safety

(*Pipeline Core*) (15 Hours) Describes the types and uses of personal protective equipment and covers hazard communications. Identifies and explains lockout/tagout and MSDS requirements. Covers safety related tools, safety rules and regulations, and work site hazards.

Trainee $20.00 ISBN 0-13-038376-7
Instructor $20.00 ISBN 0-13-038385-6

64103-02 Trade Math

(40 Hours) Identifies and explains instrumentation formulas and equations. Explains how to calculate load and ampacity. Also describes conductors and performing pipeline-specific E&I calculations.

Trainee $20.00 ISBN 0-13-038377-5
Instructor $20.00 ISBN 0-13-038386-4

64104-02 Electrical Theory

(40 Hours) Offers a general introduction to the electrical concepts used in Ohm's law as applied to DC series circuits. Includes atomic theory, electromotive force, resistance, and electric power equations. Also introduces series, parallel, and series-parallel circuits. Covers resistive circuits, Kirchoff's voltage and current laws, and circuit analysis.

Trainee $20.00 ISBN 0-13-038378-3
Instructor $20.00 ISBN 0-13-038387-2

64105-02 Tools of the Trade

(15 Hours) Identifies and explains the types of hand tools used in the pipeline E&I trade. Also explains trade-specific power tools, test equipment, and communication equipment.

Trainee $20.00 ISBN 0-13-038379-1
Instructor $20.00 ISBN 0-13-038388-0

64106-02 Pipeline Operations

(40 Hours) Describes pipeline system hydraulics and ANSI ratings and standards. Explains station control systems and recognizing and responding to AOCs. Also covers pigging operations and proving process meters.

Trainee $20.00 ISBN 0-13-038370-8
Instructor $20.00 ISBN 0-13-038389-9

64107-02 Pipeline E&I Drawings

(30 Hours) Identifies and explains drawing classifications and written specifications. Describes the uses of electrical drawings and piping and instrumentation drawings. Also covers special drawings and documentation as well as pipeline maps and alignment sheets.

Trainee $20.00 ISBN 0-13-038382-1
Instructor $20.00 ISBN 0-13-038380-5

64108-02 Understanding the *National Electrical Code*®

(7.5 Hours) Provides a navigational road map for using the *NEC*®. Introduces trainees to the layout of the *NEC*® and the types of information found within the code book. Presents an easy-to-follow procedure for finding information in the *NEC*®.

Trainee $20.00 ISBN 0-13-038383-X
Instructor $20.00 ISBN 0-13-038391-0

64109-02 Fasteners and Anchors

(7.5 Hours) Introduces the hardware and systems used to mount and support boxes, receptacles, and other electrical components. Covers the various types of anchors and supports, their applications, and safe installation.

Trainee $20.00 ISBN 0-13-038384-8
Instructor $20.00 | ISBN 0-13-038392-9

PIPELINE ELECTRICAL & INSTRUMENTATION LEVEL TWO

265 Hours | Published 2002

Pipeline Electrical & Instrumentation Level Two—PERFECT-BOUND—Includes all modules below

Trainee Guide: $100.00 ISBN 0-13-046691-3
Annotated Instructor's Guide: $100.00 ISBN 0-13-046692-1

MODULES

The following ISBN and pricing information is for ordering individual modules.

64201-02 Electrical Installations in Classified Areas

(40 Hours) Explains Class I, II, III, and IV pipeline areas. Describes intrinsically safe devices and systems and their ratings. Also covers allowable conduits and fittings, and explosion-proof enclosures. Explains safe work practices in classified areas, including barriers, PPE, monitoring requirements, and gas detectors.

Trainee $20.00 ISBN 0-13-038393-7
Instructor $20.00 ISBN 0-13-038404-6

64202-02 Use of Meters and Test Equipment

(15 Hours) Explains general, personal, and test equipment for E&I safety. Explains measuring current, voltage, and resistance and the types of meters used. Includes specialty instruments such as calibrators, simulators, and gauges. Includes sections on oscilloscope operation, waveform characteristics, and measurement techniques.

Trainee $20.00 ISBN 0-13-038394-5
Instructor $20.00 ISBN 0-13-038405-4

64203-02 Grounding

(30 Hours) Explains grounding basics, system types, *NEC*® requirements, equipment grounding, and how to bond service equipment. Includes discussion of effective grounding paths, conductors, separately derived systems, grounding at more than one building, and systems over 1,000 volts. Describes how to test grounding and measure earth resistance, three-point testing, and tank grounding.

Trainee $20.00 ISBN 0-13-038395-3
Instructor $20.00 ISBN 0-13-038406-2

64204-02 Process Control Theory

(40 Hours) Explains process characteristics and control systems. Describes control loop components and control loops and modes. Includes discussion of the types of control applications, including temperature, pressure, flow, and level control.

Trainee $20.00 ISBN 0-13-038396-1
Instructor $20.00 ISBN 0-13-038408-9

64205-02 Supervisory Control Systems

(15 Hours) Explains pipeline supervisory control systems, PLCs, HMIs, and RTUs. Describes data highways and protocols, including data transfer methods, and SCADA-related communications, including transfer media, wireless radios, and Ethernet, and transmission and interface methods.

Trainee $20.00 ISBN 0-13-038397-X
Instructor $20.00 ISBN 0-13-038409-7

64206-02 Switches and Transmitters

(*CT 25, 30, 31*) (15 Hours) Discusses pipeline pressure, flow, level, and temperature switches and pneumatic, electronic, and optical transmitters. Explains how to test, repair, inspect, and maintain switches and transmitters. Describes pigs and sphere detectors and recorders. Explains DOT coverage and regulations.

Trainee $20.00 ISBN 0-13-038398-8
Instructor $20.00 ISBN 0-13-038400-3

64207-02 Controllers

(*CT 26*) (15 Hours) Explains control and PID loops and verifying and setting protection parameters. Includes information on proper procedures and potential AOCs. Explains how to troubleshoot and tune open and closed loops.

Trainee $20.00 ISBN 0-13-038390-2
Instructor $20.00 ISBN 0-13-038411-9

64208-02 Valve Actuators

(*CT 19.5*) (15 Hours) Explains valve actuator components, including switches, power mechanisms, and heaters. Describes valve actuator types, symbols and schematics, uses, and actuator interfaces. Describes setting valve limits, and installing, repairing, and maintaining actuators.

Trainee $20.00 ISBN 0-13-038401-1
Instructor $20.00 ISBN 0-13-038412-7

64209-02 Product Measurement

(*CT 44.1 and 44.2*) (40 Hours) Explains custody transfer and how to test, repair, install, and maintain custody transfer equipment and devices. Covers testing, repairing, installing, and maintaining prover equipment, process measurement equipment, and flow measurement equipment.

Trainee $20.00 ISBN 0-13-038402-X
Instructor $20.00 ISBN 0-13-038413-5

64210-02 Analytical Equipment

(*CT 55*) (40 Hours) Identifies many types of pipeline analytical equipment. Explains the maintenance of hydrogen sulfide and sulfur analyzers. Explains how to maintain chromatographs, moisture analyzers, vapor and combustible gas detectors, continuous emissions monitoring systems, and centrifuges.

Trainee $20.00 ISBN 0-13-038403-8
Instructor $20.00 ISBN 0-13-038415-1

PIPELINE ELECTRICAL & INSTRUMENTATION LEVEL THREE

185 Hours | Published 2003

Pipeline Electrical & Instrumentation Level Three—PERFECT-BOUND—Includes all modules below

Trainee Guide: $100.00 ISBN 0-13-101082-4
Annotated Instructor's Guide: $100.00 ISBN 0-13-101083-2

MODULES

The following ISBN and pricing information is for ordering individual modules.

64301-02 Transformers

(25 Hours) Describes power systems, explains transformer construction, taps, installation requirements, and connections. Describes power distribution, instruments, control, and isolation transformer types. Explains transformer maintenance and testing.

Trainee $20.00 ISBN 0-13-103140-6
Instructor $20.00 ISBN 0-13-103148-1

64302-02 Switchgear and MCCs

(25 Hours) Explains power factor and medium versus low-voltage cable and MCCs. Describes types of switchgear and cables, feeders, bussing, and bracing. Includes testing and maintenance on switchgear and MCCs and associated components.

Trainee $20.00 ISBN 0-13-103141-4
Instructor $20.00 ISBN 0-13-103149-X

64303-02 Low-Voltage and Standby Power

(25 Hours) Explains pipeline system standby generators, batteries, chargers, inverters, converters, and rotary and static UPSs. Also addresses the maintenance and testing of each.

Trainee $20.00 ISBN 0-13-103142-2
Instructor $20.00 ISBN 0-13-103150-3

64304-02 Power Quality

(25 Hours) Explains power quality and types of defects, power systems, protection, and conditioning equipment. Discusses types of electrical noise and related problems, and possible solutions. Explains static electricity and its effect, system verification testing, and equipment maintenance.

Trainee $20.00 ISBN 0-13-103143-0
Instructor $20.00 ISBN 0-13-103152-X

64305-02 Prime Movers

(32.5 Hours) Describes various electric motors and drives and their components. Discusses their maintenance and testing. Explains engine types, cooling and lubrication systems, turbine operation, fuel sources, and controls.

Trainee $20.00 ISBN 0-13-103145-7
Instructor $20.00 ISBN 0-13-103153-8

64306-02 Facility Auxiliary Systems

(22.5 Hours) Includes information on pipeline facility buildings and related systems. Systems covered include: fire, security, vapor recovery, injection, water treatment, cathodic protection, and blending systems.

Trainee $20.00 ISBN 0-13-103146-5
Instructor $20.00 ISBN 0-13-103154-6

64307-02 SCADA

(30 Hours) Explains pipeline operations systems, including control, communications, SCADA, and PLC. Explains redundant systems and control system troubleshooting.

Trainee $20.00 ISBN 0-13-103147-3
Instructor $20.00 ISBN 0-13-103155-4

PIPELINE MAINTENANCE LEVEL ONE

157.5 Hours (includes 72.5 hours of Core Curriculum) | Published 2002

CORE CURRICULUM

PERFECT-BOUND
Trainee Guide: $40.00 ISBN 0-13-109187-5
Annotated Instructor's Guide: $40.00 ISBN 0-13-109191-3
LOOSE-LEAF
Trainee Guide: $40.00 ISBN 0-13-109188-3
Annotated Instructor's Guide: $40.00 ISBN 0-13-109192-1
HARD-COVER
Trainee Guide: $45.00 ISBN 0-13-109189-1

Pipeline Maintenance Level One—PERFECT-BOUND
Includes all modules below

Trainee Guide: $100.00 ISBN 0-13-046676-X
Annotated Instructor's Guide: $100.00 ISBN 0-13-046677-8

MODULES

The following ISBN and pricing information is for ordering individual modules.

66101-02 Introduction to the Pipeline Industry

(*Pipeline Core*) (15 Hours) Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.

Trainee $20.00 ISBN 0-13-038233-X
Instructor $20.00 ISBN 0-13-038234-5

66102-02 Liquid Pipeline General Abnormal Operating Conditions

(*Pipeline Core*) (5 Hours) Introduces the Abnormal Operating Conditions (AOCs) that can occur on a pipeline or in a pipeline facility. Includes general procedures on how to recognize and react to AOCs and the necessary documentation and notifications that must be completed when responding to AOCs.

Trainee $20.00 ISBN 0-13-038224-8
Instructor $20.00 ISBN 0-13-038235-3

62103-02 Release Identification and Response

(7.5 Hours) Describes company environmental manuals and the DNR and EPA regulations. Explains the NRC and Coast Guard responsibilities and spill prevention. Identifies and explains soil contamination, release reporting and containment, hydrostatic testing, flaring/venting, and trash handling.

Trainee $20.00 ISBN 0-13-038307-4
Instructor $20.00 ISBN 0-13-038314-7

62104-02 Tools of the Trade

(10 Hours) Explains use and care of the hand and power tools that are used in the pipeline industry. Describes the use of welding equipment and meters and testers. Also explains nondestructive testing and the uses of hydraulic cranes and heavy excavating equipment.

Trainee $20.00 ISBN 0-13-038309-0
Instructor $20.00 ISBN 0-13-038315-5

62105-02 Pipeline Documentation

(15 Hours) Identifies and explains the alignment sheets used in the pipeline industry including maps, P&IDs, and electrical drawings. Also describes the types of documentation and document management required in the industry.

Trainee $20.00 ISBN 0-13-038311-2
Instructor $20.00 ISBN 0-13-038317-1

62106-02 Preventing Pipeline Damage

(*CT 14 and 28*) (15 Hours) Describes the One-Call system and how it is used to prevent pipeline damage. Identifies and explains the methods used to prevent third-party and employee-caused pipeline damage. Explains the importance of public awareness. Includes placing and maintaining permanent line markers and providing security for pipeline facilities.

Trainee $20.00 ISBN 0-13-038312-0
Instructor $20.00 ISBN 0-13-038318-X

62107-02 Excavating and Backfilling

(*CT 17, 32, and 39*) (17.5 Hours) Explains OSHA requirements and methods for locating and marking pipelines. Identifies the permits required and the procedures for exposing pipe and performing damage inspection. Describes reporting defects, water inspections, and backfilling.

Trainee $20.00 ISBN 0-13-038313-9
Instructor $20.00 ISBN 0-13-038319-8

PIPELINE MAINTENANCE LEVEL TWO

155 Hours | Published 2002

Pipeline Maintenance Level Two—PERFECT-BOUND
Includes all modules below

Trainee Guide: $100.00 ISBN 0-13-046678-6
Annotated Instructor's Guide: $100.00 ISBN 0-13-046679-4

MODULES

The following ISBN and pricing information is for ordering individual modules.

62201-02 Right-of-Way Inspection

(*CT 15 and 16*) (20 Hours) Discusses procedures for inspections of pipeline right of way. Explains navigable water crossing inspection. Contains information on methods of patrol for pipeline right of way inspections on land, including reportable observations and reporting protocol.

Trainee $20.00 ISBN 0-13-038310-4
Instructor $20.00 ISBN 0-13-038328-7

62202-02 Facility Inspection

(*CT 27*) (17.5 Hours) Covers inspection of pipeline facilities, including security systems and other building systems. Also discusses inspections of tanks and tank farms.

Trainee $20.00 ISBN 0-13-038321-X
Instructor $20.00 ISBN 0-13-038329-5

62203-02 Valve Inspection

(*CT 20*) (22.5 Hours) Introduces and explains the operation of different types of valves. Includes information on valves that start and stop flow, regulate flow and pressure, relieve pressure, and regulate direction of flow. Discusses procedures for inspecting valves and performing some basic preventative maintenance on valves.

Trainee $20.00 ISBN 0-13-038322-8
Instructor $20.00 ISBN 0-13-038320-1

62204-02 Pipeline Coating Inspection

(*CT 5*) (20 Hours) Explains different types of pipeline coatings available, and some methods of application. Introduces some basic pipeline coating problems, and inspection of pipeline coating.

Trainee $20.00 ISBN 0-13-038323-6
Instructor $20.00 ISBN 0-13-038331-7

62205-02 Pipe Inspection and Nondestructive Testing

(*CT 38.1, 38.2, and 38.3*) (25 Hours) Outlines methods of pipe inspection for liquid petroleum pipelines. Discusses requirements for visual inspections of pipe, pipe components, and welds on pipe. Also discusses different methods of nondestructive testing and evaluation on pipelines, including liquid penetrant, magnetic particle, ultrasonic, and radiographic tests. Procedures for verifying nondestructive weld tests and verifying that the weld meets mandated requirements are also given.

Trainee $20.00 ISBN 0-13-038325-2
Instructor $20.00 ISBN 0-13-038333-3

62206-02 Pipeline Maintenance

(*CT 18 and 52*) (32.5 Hours) General discussion of some basic pipeline maintenance issues. Includes information and procedures on locating underground structures on the pipeline, maintaining the pipeline route, excavating utilities and pipeline components safely and properly, applying coating, tightening flanges, running maintenance pigs, and performing leak surveys on liquid and gas pipelines.

Trainee $20.00 ISBN 0-13-038326-0
Instructor $20.00 ISBN 0-13-038334-1

62207-02 Hydrostatic Testing

(*CT 41*) (17.5 Hours) Explains the principles and requirements of hydrostatic testing on pipelines. Explains necessary preparations for testing, and describes the testing procedures.

Trainee $20.00 ISBN 0-13-038327-9
Instructor $20.00 ISBN 0-13-038335-X

PIPELINE MAINTENANCE LEVEL THREE

227.5 Hours | Published 2002

Pipeline Maintenance Level Three—PERFECT-BOUND
Includes all modules below

Trainee Guide: $100.00 ISBN 0-13-101077-8
Annotated Instructor's Guide: $100.00 ISBN 0-13-101078-6

MODULES

The following ISBN and pricing information is for ordering individual modules.

62301-02 General Maintenance and Winterizing Pipeline Equipment

(7.5 Hours) Explains preventive and predictive maintenance and general maintenance on rotating machinery. Explains gas compressors and maintaining pumps and prime movers.

Trainee $20.00 ISBN 0-13-103156-2
Instructor $20.00 ISBN 0-13-103166-X

62302-02 Pipeline Damage Inspection

(*CT 34 and 35*) (10 Hours) Identifies sources and types of damage, including construction, third-party, natural events, and blasting. Explains checking pipe clearance and repairing wide cracks and foam damage.

Trainee $20.00 ISBN 0-13-103157-0
Instructor $20.00 ISBN 0-13-103167-8

62303-02 Performing In-Line Inspections

(*CT 29*) (15 Hours) Explains the preparation for pigging, types of pigs and associated tools, and running pigs. Includes following up on collected data, such as interpreting findings.

Trainee $20.00 ISBN 0-13-103158-9
Instructor $20.00 ISBN 0-13-103168-6

62304-02 Pipeline Repair

(*CT 9.5, 37, 40.1, 40.2, 40.3, 40.4, 40.5, 40.7, and 40.91*) (40 Hours) Covers the proper procedures for several pipeline repairs. Includes information on installing various types of pipe sleeves, cutting and replacing sections of pipe, performing taps of two inches or smaller, and repairing shorted casings. Also discusses issues related to support structures for aboveground pipe.

Trainee $20.00 ISBN 0-13-103159-7
Instructor $20.00 ISBN 0-13-103170-8

62305-02 Relocating and Lowering Pipelines

(*CT 33 and 34*) (15 Hours) Explains preparations for moving pipelines, both in-service and out-of-service, procedures for moving pipelines, inspecting the line, and backfilling the excavation.

Trainee $20.00 ISBN 0-13-103160-0
Instructor $20.00 ISBN 0-13-103171-6

62306-02 Hot Tapping and Stoppling®—2.5" and Larger

(*CT 40.6, 40.8, 40.9, and 40.91*) (15 Hours) Discusses hot tapping procedures, including safety issues, selection of equipment, and preparation for tapping. Gives instructions for installing tapping machines, and stoppling procedures. Also contains information on other line plugging methods.

Trainee $20.00 ISBN 0-13-103161-9
Instructor $20.00 ISBN 0-13-103172-4

62307-02 Tank Repair

(40 Hours) Explains complete tank repair, including flange tightening, nondestructive testing, electrically insulated fittings and flanges, welding, bottom repair, bottom replacement, moving, arc burn and weld repair, roof installation, shell plate replacement, aluminum and steel floating roof demolition, building a floating roof, floating roof in-service seal replacement, and nozzles, manways, and sumps.

Trainee $20.00 ISBN 0-13-103162-7
Instructor $20.00 ISBN 0-13-103173-2

62308-02 Maintenance Welding on Pipelines

(*CT 42*) (25 Hours) Explains repairing arc burns, defective welds, direct pass defects, butt welds, and previously repaired welds. Includes weld or cylinder of pipe replacement, general welding procedures, and dealing with problems. Also discusses the requirements for inspection of maintenance welds on pipelines.

Trainee $20.00 ISBN 0-13-103163-5
Instructor $20.00 ISBN 0-13-103174-0

62309-02 Performing Pipeline Disconnection Procedures

(*CT 36*) (20 Hours) Identifies equipment and procedures required to safely perform disconnection procedures and hazards that may be encountered. Explains performing safe disconnects, purging pipeline segments, and sealing disconnected pipeline.

Trainee $20.00 ISBN 0-13-103164-3
Instructor $20.00 ISBN 0-13-103175-9

62310-02 Vault Maintenance and Confined Space Entry

(*CT 59*) (15 Hours) Identifies the safety requirements and the hazards of confined space entry. Explains vault inspections.

Trainee $20.00 ISBN 0-13-103165-1
Instructor $20.00 ISBN 0-13-103176-7

62401-03 Radiographic Testing of Pipeline Welds

(*CT 38.4*) (25 hours) Provides specific training for certified SNT-TC-1A Level II radiographic technicians who perform radiographic testing of pipeline welds in accordance with the requirements of API 1104. Gives an overview of x-ray and gamma ray theory, reviews radiation safety procedures, and covers the exposure, processing, and interpretation of radiographic film. Recognition of specific discontinuities using copies of radiographic images is featured.

NOTE: This module is NOT included in the perfect-bound version of Pipeline Maintenance Level Three. It is sold as a stand-alone module.

Trainee $20.00 ISBN 0-13-106800-8
Instructor $20.00 ISBN 0-13-106801-6

PIPELINE MECHANICAL LEVEL ONE

197.5 Hours (Includes 72.5 hours of Core Curriculum) | Published 2002

CORE CURRICULUM

PERFECT-BOUND
Trainee Guide: $40.00 ISBN 0-13-109187-5
Annotated Instructor's Guide: $40.00 ISBN 0-13-109191-3
LOOSE-LEAF
Trainee Guide: $40.00 ISBN 0-13-109188-3
Annotated Instructor's Guide: $40.00 ISBN 0-13-109192-1
HARD-COVER
Trainee Guide: $45.00 ISBN 0-13-109189-1

Pipeline Mechanical Level One—PERFECT-BOUND
Includes all modules below

Trainee Guide: $100.00 ISBN 0-13-046670-0
Annotated Instructor's Guide: $100.00 ISBN 0-13-046681-6

MODULES

The following ISBN and pricing information is for ordering individual modules.

66101-02 Introduction to the Pipeline Industry

(*Pipeline Core*) (15 Hours) Introduces the pipeline industry, including pipeline products and flow paths, maps and drawings used in the industry, and basic pipeline operations. Also covers hydraulics, pipeline equipment, electrical power systems, and corrosion control. Regulations, documentation, and pipeline industry occupations are also described.

Trainee $20.00 ISBN 0-13-038223-X
Instructor $20.00 ISBN 0-13-038234-5

66102-02 Liquid Pipeline General Abnormal Operating Conditions

(*Pipeline Core*) (5 Hours) Introduces the Abnormal Operating Conditions (AOCs) that can occur on a pipeline or in a pipeline facility. Includes general procedures on how to recognize and react to AOCs and the necessary documentation and notifications that must be completed when responding to AOCs.

Trainee $20.00 ISBN 0-13-038224-8
Instructor $20.00 ISBN 0-13-038235-3

63103-02 Pipeline Mechanic Hand and Power Tools

(10 Hours) Introduces various hand and power tools used to maintain and install pipeline equipment. Explains basic hand and power tool safety and procedures for selecting, inspecting, using, and maintaining the tools.

Trainee $20.00 ISBN 0-13-038336-8
Instructor $20.00 ISBN 0-13-038343-0

63104-02 Piping and Mechanical Blueprint Reading

(15 Hours) Explains how to read plot plans, P&IDs, piping isometric drawings, detail sheets, and machine drawings. Also explains the common components and symbols used in various types of drawings.

Trainee $20.00 ISBN 0-13-038337-6
Instructor $20.00 ISBN 0-13-038344-9

63105-02 Tubing, Threaded Pipe, and Hoses

(30 Hours) Introduces a variety of tubing, tubing materials, tools, and work practices used in the pipeline industry. Identifies the various materials used in threaded piping systems and explains the types and uses of various screwed fittings. Also covers identification of hoses and hose fittings and standard installation practices.

Trainee $20.00 ISBN 0-13-038338-4
Instructor $20.00 ISBN 0-13-038345-7

63106-02 Fasteners

(10 Hours) Identifies and explains installation procedures for threaded, nonthreaded, and insulation fasteners used in the pipeline industry.

Trainee $20.00 ISBN 0-13-038339-2
Instructor $20.00 ISBN 0-13-038346-5

63107-02 Identify, Install, and Maintain Valves

(*CT 19.1 through 19.4*) (15 Hours) Identifies the various types of valves used in the pipeline industry and covers storage and handling, installation, and preventive maintenance procedures for these valves.

Trainee $20.00 ISBN 0-13-038330-9
Instructor $20.00 ISBN 0-13-038347-3

63108-02 Identify Types of Valve Actuators/Operators

(15 Hours) Identifies the various types of manual, electric, hydraulic, and pneumatic valve actuators used in the pipeline industry and covers storage and handling, installation, and preventive maintenance procedures for these actuators.

Trainee $20.00 ISBN 0-13-038341-4
Instructor $20.00 ISBN 0-13-038348-1

63109-02 Installing Seals and Gaskets

(10 Hours) Covers the applications, removal procedures, and installation procedures for dynamic and static seals and O-rings used in the pipeline industry. Also identifies gaskets and gasket materials and explains the procedures for laying out, cutting, and installing gaskets.

Trainee $20.00 ISBN 0-13-038342-2
Instructor $20.00 ISBN 0-13-038340-6

PIPELINE MECHANICAL LEVEL TWO

155 Hours | Published 2002

Pipeline Mechanical Level Two—PERFECT-BOUND
Includes all modules below

Trainee Guide: $100.00 ISBN 0-13-046682-4
Annotated Instructor's Guide: $100.00 ISBN 0-13-046683-2

MODULES

The following ISBN and pricing information is for ordering individual modules.

63201-02 Introduction to Pneumatic Systems

(10 Hours) Explains pneumatic system safety, characteristics of gases and how they are compressed, pneumatic transmission of energy, and compressor operation.

Trainee $20.00 ISBN 0-13-038351-1
Instructor $20.00 ISBN 0-13-038363-5

63202-02 Introduction to Hydraulic Systems

(10 Hours) Explains hydraulic system safety and the basic principles of hydraulics, including Pascal's law and Bernoulli's principle. Explains the function of fluids, parts, pumps, and motors.

Trainee $20.00 ISBN 0-13-038352-X
Instructor $20.00 ISBN 0-13-038364-3

63203-02 Specialty and Precision Tools

(15 Hours) Introduces different types of specialty tools and precision measuring tools and explains how to select, inspect, use, and care for these tools.

Trainee $20.00 ISBN 0-13-038353-8
Instructor $20.00 ISBN 0-13-038366-X

63204-02 Inspect and Repair Valves

(*CT 20, 21.2, and 21.3*) (20 Hours) Identifies and explains the different valve inspection requirements. Describes routine walk-around inspections, external integrity inspections, functional test requirements, and the procedures to leak test a valve. Also describes how to disassemble a valve, perform internal inspection requirements, and reassemble a valve.

Trainee $20.00 ISBN 0-13-038354-6
Instructor $20.00 ISBN 0-13-038367-8

63205-02 Maintain and Repair Pressure Limiting Devices and Relief Valves

(*CT 22, 23.1, 23.2, and 24*) (20 Hours) Identifies types of relief valves and pressure limiting devices. Explains how to inspect, test, and calibrate tank relief valves, pipeline relief valves, and pressure limiting devices.

Trainee $20.00 ISBN 0-13-038355-4
Instructor $20.00 ISBN 0-13-038368-6

63206-02 Introduction to Metering Devices and Provers

(10 Hours) Identifies and explains the use of various types of pipeline meters including positive displacement, turbine, ultrasonic, mass-flow, vortex, and orifice. Identifies and explains the use of provers including tank provers, traditional pipe provers, and small volume pipe provers.

Trainee $20.00 ISBN 0-13-038357-0
Instructor $20.00 ISBN 0-13-038369-4

63207-02 Introduction to Pumps

(10 Hours) Identifies and explains various types of main-line and feeder line pumps including centrifugal, rotary, reciprocating, and metering pumps. Explains net positive suction head and cavitation. Outlines general procedures for pump installation.

Trainee $20.00 ISBN 0-13-038358-9
Instructor $20.00 ISBN 0-13-038360-0

63208-02 Introduction to Gas Compressors

(10 Hours) Identifies and explains the various types of gas compressors used in the transmission of gas through pipelines. Also explains the function and operation of compressors and identifies the auxiliary equipment used with compressors.

Trainee $20.00 ISBN 0-13-038359-7
Instructor $20.00 ISBN 0-13-038371-6

63209-02 Install and Maintain Bearings

(15 Hours) Identifies and explains various types of friction and antifriction bearings, bearing materials, and bearing designation. Gives procedures to remove, troubleshoot, and install bearings.

Trainee $20.00 ISBN 0-13-038350-3
Instructor $20.00 ISBN 0-13-038373-2

63210-02 Install Mechanical Seals

(20 Hours) Explains the function and advantages of mechanical seals. Identifies parts and types of mechanical seals. Includes procedures for removing, inspecting, and installing mechanical seals.

Trainee $20.00 ISBN 0-13-038361-9
Instructor $20.00 ISBN 0-13-038374-0

63211-02 Maintain and Repair Drivers

(15 Hours) Identifies types of drivers that provide power to rotating equipment on pipelines. Explains how to inspect and replace drivers, replace bearings and seals, and perform preventative maintenance.

Trainee $20.00 ISBN 0-13-038362-7
Instructor $20.00 ISBN 0-13-038375-9

PIPELINE MECHANICAL LEVEL THREE

160 Hours | Published 2002

Pipeline Mechanical Level Three—PERFECT-BOUND

Includes all modules below

Trainee Guide: $100.00 ISBN 0-13-101079-4
Annotated Instructor's Guide: $100.00 ISBN 0-13-101081-6

MODULES

The following ISBN and pricing information is for ordering individual modules.

63301-02 Installing Rotating Equipment

(25 Hours) Identifies the inspection requirements for an equipment pad, requirements for equipment base preparation, and procedures for inspecting equipment prior to installation. Also explains how to prepare equipment prior to installation, the installation process for rotating equipment, and the procedures used to relieve pipe stress from rotating equipment.

Trainee $20.00 ISBN 0-13-103178-3
Instructor $20.00 ISBN 0-13-103188-0

63302-02 Unit Alignment

(40 Hours) Describes the types of equipment misalignment and how to identify and correct them. Explains how to perform conventional, rim and face indicator, reverse dial indicator, and laser alignments. Also identifies other laser alignment procedures that may be completed on the machinery trains depending on equipment needs.

Trainee $20.00 ISBN 0-13-103179-1
Instructor $20.00 ISBN 0-13-103189-9

63303-02 Vibration Analysis

(5 Hours) Explains and identifies the most common causes of vibration and how to minimize them. Includes vibration monitoring techniques, vibration analysis techniques, vibration test equipment, and how to field balance machines.

Trainee $20.00 ISBN 0-13-103180-5
Instructor $20.00 ISBN 0-13-106190-9

63304-02 Maintain, Troubleshoot, and Repair Pumps

(10 Hours) Identifies the preventive maintenance requirements, inspection requirements, and common troubleshooting techniques for pumps used in the pipeline industry. Also gives general guidelines for preparing a pump for shutdown, removing a pump from a pipeline system, disassembling a pump, installing the pump after the pump has been reassembled, and preparing the pump for startup and operational check after maintenance or repair has been completed.

Trainee $20.00 ISBN 0-13-103181-3
Instructor $20.00 ISBN 0-13-103191-0

63305-02 Maintain, Troubleshoot, and Repair Gas Compressors

(15 Hours) Identifies the typical lubrication system components, preventive maintenance requirements, and common troubleshooting techniques for a gas compressor. Also gives general guidelines for preparing a gas compressor for shutdown and repair, isolating a gas compressor from a pipeline system, repairing rotary and reciprocating gas compressors, and preparing a gas compressor for startup and operational check after maintenance has been completed.

Trainee $20.00 ISBN 0-13-103182-1
Instructor $20.00 ISBN 0-13-103192-9

63306-02 Maintain, Troubleshoot, and Repair Pneumatic Valve Actuators/Operators and Systems

(*CT 19.6 and 21.1*) (15 Hours) Explains the general procedures for performing preventive maintenance and troubleshooting pneumatic systems. Includes inspecting and repairing pneumatic system components. Also explains how to adjust and repair pneumatic valve actuators/operators and read pneumatic system schematic diagrams.

Trainee $20.00 ISBN 0-13-103183-X
Instructor $20.00 ISBN 0-13-103194-5

63307-02 Maintain, Troubleshoot, and Repair Hydraulic Valve Actuators/Operators and Systems

(*CT 19.7 and 21.4*) (15 Hours) Explains the general procedures for performing preventive maintenance and troubleshooting hydraulic systems. Includes inspecting and repairing hydraulic system components. Also explains how to adjust and repair hydraulic valve actuators/operators and read hydraulic system schematic diagrams

Trainee $20.00 ISBN 0-13-103184-8
Instructor $20.00 ISBN 0-13-103195-3

63308-02 Maintain, Troubleshoot, and Repair Electric Valve Actuators/Operators and Systems

(CT 19.5 and 21.5) (15 Hours) Explains the general procedures for performing preventive maintenance and troubleshooting electric valve actuators/operators. Includes inspecting electric valve actuator/operator components. Also explains how to adjust and repair electric valve actuator/operators.

Trainee $20.00 ISBN 0-13-103186-4
Instructor $20.00 ISBN 0-13-103196-1

63309-02 Maintain, Troubleshoot, and Repair Metering Devices and Provers

(20 Hours) Explains how to inspect, maintain, and repair metering devices and prover systems. Also describes the waterdraw calibration procedures used to calibrate and verify the reliability of prover systems.

Trainee $20.00 ISBN 0-13-103187-2
Instructor $20.00 ISBN 0-13-103197-X

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Core/Tools Value Pack

$60.00 ISBN 0-13-109933-7

NOTE: Free publications with an asterisk are subject to a $10.00 handling charge for each total order, plus actual shipping charges.

Air Research

EMISSIONS: GENERAL

Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Gas Industry ■ API Tools for Estimating GHG Emissions

Accurate estimation of greenhouse gas emissions is indispensable to responsibly addressing climate change. Through API, the U.S. oil and natural gas industry has provided a suite of tools for estimating emissions. It includes API's updated 2009 compendium of emissions estimation methodologies, software for emissions estimation and inventorying, and guidelines (created by the international petroleum organization IPIECA) to assist in the accounting and reporting of emissions.

August 2009 | Available for download at: www.api.org/ehs/climate/new/upload/2009_GHG_COMPENDIUM.pdf

DR 76
Determination of Emissions from Retail Gasoline Outlets Using Optical Remote Sensing: Pilot Field Study at a Non-vapor Recovery Site, Project Summary Report, Volume I

The results of this study are presented in a three-volume report. Volume I presents the results of a pilot study to evaluate the use of optical remote sensing (ORS) technology for determining emission factors as well as the dispersion of the emissions at an uncontrolled retail gasoline outlet (RGO). ORS techniques may be able to provide a direct method of determining the total emissions from an RGO under varied conditions and to provide this information with little interference with the operation of RGO. Volume II, Determination of Emissions from Retail Gasoline Outlets Using Optical Remote Sensing: Pilot Field Study at a Non-Vapor Recovery Site, Technical Report and Volume III, Determination of Emissions from Retail Gasoline Outlets Using Optical Remote Sensing: Pilot Field Study at a Non-Vapor Recovery Site, Appendices are available from API's web site: *http://www.api.org/ehs/publications/dr76.htm* as downloadable PDF files. Pages: 50

November 1999 | Product Number: I00076 | Price: $118.00

DR 141
Global Emissions of Carbon Dioxide from Petroleum Sources

This report describes carbon dioxide emission estimates developed for a broadly defined petroleum industry whose five segments include (1) exploration and extraction; (2) crude petroleum transportation to refineries; (3) refining operations; (4) refinery products transportation; and (5) end uses. Emission estimates for carbon dioxide have been developed for each industry segment and for each country. Activity factors describe the activity level for a particular industrial activity. Corresponding emission factors for each activity factor were developed from EPA and industry documents. Pages: 91

July 1991 | Product Number: I00141 | Price: $57.00

Publ 326
The Cost Effectiveness of VOC and NO_x Emission Control Measures

This document provides air pollution control planners and other interested parties in ozone nonattainment areas with a "menu" of possible control options using the most up-to-date information and accurate analyses for significant sources of VOCs and NO_x. The menu provides a preliminary demonstration of how cost-effective packages of attainment strategies and control measures can be developed to reduce volatile organic compound emissions by 15 percent by 1996. Appendices provide a detailed analysis of costs, effectiveness, and application limitations. Pages: 354

September 1994 | Product Number: J32600 | Price: $143.00

Publ 332
Comparison of Screening Values from Selected Hydrocarbon Screening Instruments

This report describes a study carried out at two refineries to compare differences in equipment leak screening values obtained from four instruments commonly used to measure fugitive emissions. The effect of screening distance was also evaluated and the results from the study were compared to those of an earlier study conducted in 1979. Adjustment factors to relate screening values from one instrument are presented, which are applicable to marketing, transportation, and E&P facilities as well as refineries. Pages: 128

August 1995 | Product Number: J33200 | Price: $87.00

Publs 342 and 343
Fugitive Emissions from Equipment Leaks I: Monitoring Manual and Fugitive Emissions from Equipment Leaks II: Calculation Procedures for Petroleum Industry Facilities

A number of federal, state, and local regulations are designed to control fugitive emissions of volatile organic compounds (VOCs) and hazardous air pollutants (HAPs). API sponsored this project to present options and recommendations on procedures for obtaining inspection and maintenance (I/M) data from certain process equipment with the potential to leak fugitive emissions. The two resulting manuals focus on the recommended fugitive emission practices in the petroleum industry, specifically for refineries, marketing terminals, and the oil and gas production industries. Pages: 204

June 1998
Product Number for Publ 342: J34200 | Price: $61.00
Product Number for Publ 343: J34300 | Price: $61.00

Publ 344
Critical Review of Source Sampling and Analysis Methodologies for Characterizing Organic Aerosol and Fine Particulate Source Emission Profiles

This report is intended for use in designing future measurement programs for characterizing emissions from stationary sources which contribute to fine particle concentrations in the atmosphere. The benefits and drawbacks of various measurement approaches are discussed, and a recommended approach for combustion sources is presented. Pages: 128

June 1998 | Product Number: J34400 | Price: $71.00

Publ 347
Hazardous Air Pollutant Emissions from Gasoline Loading Operations at Bulk Gasoline Terminals

HAP emission testing was conducted at 33 bulk gasoline terminals across the United States. Emissions were measured from the loading of gasoline cargo tanks at facilities with a vapor control system. Emission tests from 23 carbon adsorption units, 8 thermal oxidizers, and 2 refrigeration units were included. Control efficiencies for eight HAP compounds were derived for the carbon adsorption units and thermal oxidizers; no control efficiencies were reported from the refrigeration units due to the limited data collected. The HAP control efficiencies presented in this report have been used to develop HAP emission factors that can be used to determine HAP emissions based on the volume of gasoline loaded at a facility. Pages: 138

October 1998 | Product Number: J34700 | Price: $80.00

Publ 348
Air Toxics Emission Factors for Combustion Sources Using Petroleum-based Fuels, Volume 1—Development of Emission Factors Using API/WSPA Approach

This project was performed with the cooperation of the California Air Resources Board (CARB) and Western States Petroleum Association to develop updated air toxic emission factors for combustion sources using

petroleum-based fuels. The emission factors developed using the best available source testing information in this project will help EPA to revise AP-42. In addition, the emission factors will be integrated into CARB's California Air Toxics Emission Factor (CATEF) database. Environmental, health, and safety engineers can use these emission factors to develop more accurate and complete emission inventories without additional source testing, which could help facilities in the permitting process. Pages: 88

August 1998 | Product Number: J34800 | Price: $97.00

Publ 4645
Methane and Carbon Dioxide Emission Estimates from U.S. Petroleum Sources

This study was conducted to obtain refined estimates of the U.S. petroleum industry's emissions of greenhouse gases. Methane (CH_4) and carbon dioxide (CO_2) emissions were estimated using 1990 as the base year and projecting those emissions to the year 2000. The emission estimates resulting from the study were reasonably consistent with previous estimates and showed little change from 1990 to 2000. Pages: 114

January 1997 | Product Number: I46450 | Price: $76.00

Publ 4653
Fugitive Emission Factors for Crude Oil and Product Pipeline Facilities

This report presents the results of a study to determine equipment component fugitive emission factors for crude oil and product pipeline facilities. The emission factors presented in this report will allow pipeline operators to estimate total hydrocarbon emissions from equipment components located at pipeline facilities in light crude service, heavy crude service, and product service. Pages: 50

June 1997 | Product Number: I46530 | Price: $76.00

Publ 4667
Vehicle Emissions Testing of Rapidly Aged Catalysts

A test program was conducted to measure the effect of changing fuel sulfur content on the exhaust emissions of a 1993 Honda Civic VX certified to meet California Transitional Low Emission Vehicle (TLEV) standards. The results showed that: (a) on average, lowering fuel sulfur content from 600 to 35 ppm reduced exhaust emissions measured over the Federal Test Procedure (FTP) by 21 to 27 percent depending on the pollutant; (b) fuel sulfur content did not have an effect on the long-term emissions performance of catalysts that have been artificially aged; (c) rapid catalyst aging did not have a large effect on sulfur response compared to in-use aging; (d) gasoline sulfur content did not have a significant effect on catalyst oxygen storage capacity for this catalyst type; and (e) the emissions response to lower sulfur obtained from measurements on a Honda Civic VX, TLEV-operated under transient conditions according to the FTP, was less than one-half of that observed in a previous study using an identical Honda catalyst in a laboratory setting. Pages: 52

November 1997 | Product Number: I46670 | Price: $59.00

Publ 4703
Gas Fired Boiler-test Report Site A: Characterization of Fine Particulate Emission Factors and Speciation Profiles from Stationary Petroleum Industry Combustion Sources

In 1997, the USEPA promulgated new ambient air standards for particulate matter smaller than 2.5 micrometers in diameter (PM2.5). Source emissions data are needed to assess the contribution of petroleum industry combustion sources to ambient PM2.5 concentrations. This report presents particulate measurement results from a 550,000 pounds per hour steam boiler firing refinery process gas. The particulate stack measurements were made using both a dilution tunnel research test method and traditional EPA sampling methods.

July 2001 | Product Number: I47030 | Price: $85.00

Publ 4704
Gas Fired Heater—Test Report Site B: Characterization of Fine Particulate Emission Factors and Speciation Profiles from Stationary Petroleum Industry Combustion Sources

In 1997, the USEPA promulgated new ambient air standards for particulate matter smaller than 2.5 micrometers in diameter (PM2.5). Source emissions data are needed to assess the contribution of petroleum industry combustion sources to ambient PM2.5 concentrations. This report presents particulate measurement results from a 114 million British thermal unit (MMBtu) per hour gas-fired refinery process heater. The particulate stack measurements were made using both a dilution tunnel research test method and traditional EPA sampling methods.

August 2001 | Product Number: I47040 | Price: $85.00

Publ 4712
Gas-Fired Steam Generator—Test Report Site C: Characterization of Fine Particulate Emission Factors and Speciation Profiles from Stationary Petroleum Industry Combustion Sources

In 1997, the USEPA promulgated new ambient air standards for particulate matter smaller than 2.5 micrometers in diameter (PM2.5). Source emissions data are needed to assess the contribution of petroleum industry combustion sources to ambient PM2.5 concentrations. This report presents that the gas fired steam generator has a maximum heat input of 62.5 MMBtu/Hr with an average rate of approximately 50 MMBtu/hr.

July 2001 | Product Number: I47120 | Price: $80.00

Publ 4720
Comparison of API and EPA Toxic Air Pollutant Emission Factors for Combustion Sources

API Publication 4720 is a study which compares and explains differences in published toxic air pollutant emission factors for combustion sources and recommends priorities for gathering additional emission factor information. Pages: 50

September 2002 | Product Number: I47200 | Price: $89.00

Publ 4772
Measuring Particulate Emissions from Combustion Sources

Since the inception of the Clean Air Act, the petroleum refining industry has been faced with the need to determine criteria pollutant emissions from combustion sources. While some of these species, such as NOx, SO_2 and CO remain in the vapor phase during and after combustion and are relatively simple to measure, particulate matter (PM) measurements are much more challenging. This is because while some PM such as fly ash or catalytic cracking catalyst fines is clearly solid material that is readily collected and measured on a sampling filter, other species that may exist in the vapor phase during combustion can later condense into aerosols downstream from the combustion zone. This can occur before or after any control devices, depending upon the temperature and composition of the combustion gases. Consequently, it has been customary to refer to PM as being composed of two PM components, filterable and condensable, the relative amounts of each depending on the stack gas composition and temperature, control devices in use at the unit, and the method for measuring PM. While measuring filterable PM is relatively straightforward (i.e. PM collected on a filter), condensable PM is a more esoteric quantity and its contribution to total PM emissions is very much dependent upon the choice of the measurement method. The EPA apparently recognized this issue, and until the interest in measuring and controlling PM 2.5 emissions emerged in the 1990s, their PM sampling methods were centered on measuring only filterable PM. At the time that these methods were originally instituted, the best available pollution control devices were mainly limited to filterable PM and could not control the condensable portion of PM emissions. As interest in the health effects associated with PM emissions increased, efforts were centered on determining the contribution of the PM 2.5 fraction which was believed to most responsible for these effects and principally composed of condensable matter. This report will review the conditions leading to the

formation of condensable particulate matter from stack gas components along with the methods used to measure PM emissions from refinery combustion sources. Pages: 27

September 2008 | Product Number: I47720 | Price: $60.00

Publ 4775 ■
Simulating the Effect of Aerobic Biodegradation on Soil Vapor Intrusion into Buildings—Evaluation of Low Strength Sources Associated with Dissolved Gasoline Plumes

Aerobic biodegradation can contribute significantly to the attenuation of petroleum hydrocarbon vapors in the unsaturated zone; however, most regulatory guidance for assessing potential human health risks via vapor intrusion to indoor air either neglect biodegradation or only allow for one order of magnitude additional attenuation for aerobically degradable compounds, which may be overly conservative in many cases. This paper describes results from 3-dimensional numerical model simulations of vapor intrusion for petroleum hydrocarbons to assess the influence of aerobic biodegradation on the attenuation factor for a variety of source concentrations and depths for buildings with basements and slab-on-grade construction. Provided that oxygen is present in the vadose zone, aerobic biodegradation of petroleum hydrocarbon vapors in the unsaturated zone will reduce the soil gas concentrations and the potential risks from vapor intrusion to indoor air compared to non-degrading compounds. At lower source concentrations and/or deeper source depths, aerobic biodegradation may result in a reduction in vapor intrusion attenuation factors by many orders of magnitude. The magnitude of the reduction depends on site-specific conditions, which should be considered in the development of a conceptual site model for each site. However, oxygen supply and degradation rates are likely to be sufficient at many sites to mitigate potential risks from vapor intrusion for low vapor concentration sources (less than about 2 mg/L-vapor total hydrocarbons). The simulations conducted in this study provide a framework for understanding the degree to which bio-attenuation will occur under a variety of scenarios and provide insight into site conditions that will result in significant biodegradation. This improved understanding may be used to select site-specific attenuation factors for degradable compounds and develop soil vapor screening levels appropriate for particular combinations of source concentrations, source depth, and building characteristics, which should be defined as part of a site conceptual model. Pages: 53

April 2009 | Product Number: I47750 | Price: $104.00

EMISSIONS: EXPLORATION & PRODUCTION

Publ 4589
Fugitive Hydrocarbon Emissions from Oil and Gas Production Operations

The emission factors derived in this report indicate that fugitive emissions from production facilities are considerably lower than they were in the late 1970s. Investigators use portable detectors to screen more than 180,000 components at 20 offshore and onshore facilities. Mass emission rates from "bagged" emitters, valves, connectors, and other components, such as seals and vents, are used to develop emission factors for individual components and groups of components. A workbook included in the report provides site operators with three different options to calculate emissions from their facilities. See also Publ 4615. Pages: 263

December 1993 | Product Number: I45890 | Price: $137.00

Publ 4615
Emission Factors for Oil and Gas Production Operation

This document supplements the information found in Publ 4589 and contains revised emission factors developed from 1993 API data using correlation equations established by EPA in 1994. The report contains emissions factors for five types of production operations—light crude production, heavy crude production, gas production, gas processing plants and offshore production. It also contains profiles of speciated emissions including air toxics, and assesses regional differences in fugitive emissions and control efficiency of Inspection and Maintenance programs. Component inventory data, screening data, and leak emission data are also included. See also Publ 4589. Pages: 56

January 1995 | Product Number: I46150 | Price: $59.00

Publ 4638
Calculation Workbook for Oil and Gas Production Equipment Fugitive Emissions

This workbook, which is the result of 5 years of field testing of equipment components at production facilities across the United States, is a valuable tool for petroleum producers who are interested in estimating fugitive emissions from their oil and gas production sites. Four methods of calculating fugitive emissions are presented: EPA Average Emission Factor Method, EPA Screening Value Range Emission Method, EPA Correlation Method, and Leak Quantification Method. Pages: 62

July 1996 | Product Number: I46380 | Price: $59.00

Publ 4644
A Methodology for Estimating Incremental Benzene Exposures and Risks Associated with Glycol Dehydrators

The EPA and API collaborated to develop a methodology to estimate benzene exposures and associated risks under representative emission conditions applicable to glycol dehydrators. The result (spreadsheet program and Monte Carlo routine) was a PC-based model called SIMRISK. A simplified version was developed that could be incorporated into control applicability criteria for glycol dehydrator vent emissions. Pages: 84

February 1997 | Product Number: I46440 | Price: $76.00

Publ 4661
Exploration and Production Emission Calculator II (EPEC II) User's Guide

The Exploration and Production Emission Calculator Version 2.0 (EPEC II) is a software tool that can be used to estimate emissions for exploration and production (E&P) facilities. EPEC II integrates user inputs, emission calculations, and data summaries for many equipment types common to E&P facilities. The calculation techniques and emission factors utilized by the EPEC II software were, in most cases, established by the U.S. Environmental Protection Agency (EPA), the American Petroleum Institute (API), and the Gas Research Institute (GRI). Published references that provide background information for the calculation methods used in EPEC II are given for each equipment type in both the software and in each section of this User's Guide. Pages: 96

2nd Edition | January 2007 | Product Number: I46610 | Price: $115.00

Publ 4662
Evaluation of a Petroleum Production Tank Emissions Model

E&P TANK was evaluated for petroleum production tanks in an emission measurement project sponsored by the American Petroleum Institute and the Gas Research Institute. Emission testing was performed on storage tank vents located at seven sites in widely diverse oil and gas producing regions across the United States measured emissions were found to be in agreement with E&P TANK model predictions. Pages: 338

October 1997 | Product Number: I46620 | Price: $113.00

Publ 4679
Amine Unit Air Emissions Model and User's Guide, AMINECalc Version 1.0

AMINECalc is a user-friendly Windows®-based software program that estimates hydrocarbon emissions from amine-based sour gas and natural gas liquid sweetening units. The output generated by the software can be used for regulatory reporting by unit operators according to the requirements of the Clean Air Act Amendments of 1990. AMINECalc performs three types of calculation options: (1) mass balance calculation, (2) gas process [gas feed] simulation, and (3) NGL process [liquid feed] simulation. Mass emission rates of hazardous air pollutants, including benzene, toluene,

ethylbenzene and xylenes (BTEX), and volatile organic compounds (VOCs) can be estimated with the use of AMINECalc. System requirements for running AMINECalc version 1.0 are IBM PC 486 compatible or higher, 8 megabytes (MB) RAM or more, and Windows® 95/98/NT. Approximately 2 MB of hard disk space are required to hold the program and its supporting run-time libraries. For better interface viewing, it is recommended that the user set the monitor to a high color 16 bit (or higher) resolution. See also Publ 4680. Pages: 76

January 1999 | Product Number: I46790 | Price: $479.00

Publ 4680
Amine Unit Air Emissions Model Evaluation

The implementation of the 1990 Clean Air Act Amendments (CAAA) in the United States has created the need for a reliable method to estimate and report hydrocarbon emissions from amine units. A simulation package, called Amine Unit Air Emission Model (AMINECalc) Version 1.0 was developed. This report evaluates the AMINECalc model by comparing the simulation results with field data collected from operating gas plants. It also recommends improvements and modifications to refine the predictions. See also Publ 4679. Pages: 96

December 1998 | Product Number: I46800 | Price: $113.00

Publ 4683
Correlation Equations to Predict Reid Vapor Pressure and Properties of Gaseous Emissions for Exploration and Production Facilities

This report establishes simple techniques for exploration and production (E&P) operators of petroleum storage tank facilities to use for the preparation of site-specific emission inventories to meet environmental regulations. Analyses were performed of oil and gas sampling results and emissions modeling results for more than 100 crude oil E&P storage tanks. Correlation equations or statistical averages were recommended to estimate Reid Vapor Pressure, vented flash gas molecular weight, vented working and standing gas molecular weight, hydrocarbon speciation (including, hazardous air pollutants), and separator gas specific gravity. Pages: 82

December 1998 | Product Number: I46830 | Price: $76.00

Publ 4697
Production Tank Emissions Model (E&P TANK, Version 2.0)

E&P TANK, developed in conjunction with the Gas Research Institute, is a personal computer model designed to use site-specific information in a user-friendly format to predict emissions from petroleum production storage tanks. The model calculates flashing losses and simulates working and standing losses, using data provided by the user. Calculations distinguish between HAPs and VOCs, showing detailed speciated emission rates from methane to decanes. System requirements are an IBM PC 386 compatible or higher, at least 2 MB RAM, a math coprocessor, and WINDOWS® 3.1 or later. Pages: 86

April 2000 | Product Number: I46970 | Price: $532.00
Member Price: $266.00

EMISSIONS: MARKETING

Publ 4588
Development of Fugitive Emission Factors and Emission Profiles for Petroleum Marketing Terminals, Volume 1

To evaluate the accuracy of fugitive emission estimates for petroleum marketing terminals, a study was designed to determine average emission factors and fugitive emission correlation equations for components in light liquid and gas vapor services. Four marketing terminals were tested and the results of the study are presented in this report. See also appendices to this document, Publ 45881. Pages: 146

May 1993 | Product Number: I45880 | Price: $119.00

Publ 45881
Development of Fugitive Emission Factors and Emission Profiles for Petroleum Marketing Terminals, Volume 2

This volume is the appendix to Publ 4588. Appendices include statistical analyses of data, field inventory sheet data, emitter data, nonaromatic speciation data, and aromatic speciation data. See also Publ 4588. Pages: 217

May 1993 | Product Number: I45881 | Price: $111.00

EMISSIONS: REFINING

Publ 310
Analysis of Refinery Screening Data

This study analyzed $5^1/2$ years of screening data from seven Los Angeles California refineries, comprising 11.5 million values. Information was obtained to help determine (1) the design and operational characteristics that influence emissions, and (2) whether a focused LDAR program could be more cost effective while reducing emissions than the current method of monitoring all system components. Pages: 64

November 1997 | Product Number: J31000 | Price: $57.00

Publ 337
Development of Emission Factors for Leaks in Refinery Components in Heavy Liquid Service

Estimating air pollutants from stationary sources is necessary for compiling emission inventories, determining emission fees, and meeting the conditions of various permits and compliances. This report provides revised emission factors applicable to refinery components in heavy liquid (HL) service, which were based on extensive field measurements. It also provides data analyses to determine whether the type of distillate or residual hydrocarbon in the stream would influence the emission factors. Pages: 68

August 1996 | Product Number: J33700 | Price: $71.00

Publ 4587
Remote Sensing Feasibility Study of Refinery Fenceline Emissions

This report reviews the state of the art of optical remote sensing (ORS) technology and examines the potential use of ORS systems combined with ancillary measurements, such as meteorological and tracer gas release data to determine fugitive emission rates. The report also highlights some issues to consider in planning an ORS field study and clarifies the attendant tradeoffs for issues such as selection of appropriate ORS systems, consideration of detection limits and beam placement, choice of dispersion models, use of tracer gas releases, time scale and timing of field studies, and the requisite meteorological measurements. Pages: 105

April 1994 | Product Number: I4587 | Price: $67.00

Publ 4612
1993 Study of Refinery Fugitive Emissions from Equipment Leaks, Volumes I and II

This report describes a study to document how fugitive emissions from equipment leaks have changed since the 1980s. Fugitive emissions from valves, pumps, connectors, and open-ended lines of five refineries were measured to develop new emission correlation equations and emission factors. Volume I contains the summaries and results of data analysis. Volume II contains descriptions of the testing approach, special studies to enhance data analysis, and documentation of quality control results. See also companion document Publ 4613. Pages: 248

April 1994 | Product Number: I46120 | Price: $137.00

Publ 4613
1993 Study of Refinery Fugitive Emissions from Equipment Leaks, Volume III

This volume is the appendix to Publ 4612. It contains raw data, in-depth discussions of calculations and statistics, and more complete, independent audit results. See also companion document Publ 4612.

April 1994 | Product Number: I46130 | Price: $94.00

Publ 4639
Estimation of Fugitive Emissions from Petroleum Refinery Process Drains

This report presents a protocol to facilitate the measurement and modeling of volatile organic compound (VOC) emissions from refinery process drains. It includes a comprehensive literature review on fugitive emissions from refinery process drains, the results of a survey of process drains at three refineries, a review of models that describe VOC emissions from drain structures and the results from a series of tests carried out to evaluate the suitability of the equipment and procedures that make up the protocol. Pages: 200

March 1996 | Product Number: I4639 | Price: $84.00

Publ 4677
Fugitive Emissions from Refinery Process Drains, Volume I, Fugitive Emission Factors for Refinery Process Drains

Emissions from refinery process drains are under increasing scrutiny, particularly with regard to volatile organic compounds (VOCs) and hazardous air pollutants (HAPs), because of the Clean Air Act Amendments of 1990. This publication is volume one of a three-part study initiated by the American Petroleum Institute (API) to update the AP-42 emission factor for refinery process drains, which may overestimate refinery process drain fugitive emissions. This volume contains simplified emission factors that can be used to quickly estimate total volatile organic compound (VOC) emissions from refinery process drains. See also Publs 4639, 4678, and 4681. Pages: 132

April 1999 | Product Number: I46770 | Price: $94.00

Publ 4678
Fugitive Emissions from Refinery Process Drains, Volume II, Fundamentals of Fugitive Emissions from Refinery Process Drains

This publication is volume two of a three-part study initiated by the American Petroleum Institute (API) to update the AP-42 emission factor for refinery process drains, which may overestimate refinery process drain fugitive emissions. This volume describes theoretical concepts and equations that may be used in a model (APIDRAIN) to estimate speciated VOC emissions. The model can provide insight on how to change process drain variables (flow rate, temperature, etc.) to reduce emissions. See also Publs 4639, 4677, and 4681. Pages: 104

April 1999 | Product Number: I46780 | Price: $94.00

Publ 4681
Fugitive Emissions from Refinery Process Drains, Volume III, Process Drain Emission Calculator: APIDRAIN Version 1.0

This is volume three of a three-part study-the computer model with user's guide to estimate emissions from refinery process drains. APIDRAIN is a user-friendly Windows®-based software program operating under the Microsoft® Excel for Windows® environment. The model allows the user to sum up the emissions from a refinery process unit area or from the entire refinery. The model user can quickly and easily predict the contribution of process drain emissions to the total emission inventory of a refinery. Unit operators can use the output generated by the software for regulatory reporting according to the requirements of the Clean Air Act Amendments of 1990. The minimum system requirements for running APIDRAIN version 1.0 are PC 486 DX2 Windows® 3.11 platform, 8 MB RAM, and Windows 95®/ Windows NT®. The user must have Windows® and Excel® installed on a personal computer to begin using the software. The APIDRAIN model is enhanced with automatic functions that enable the user to easily summarize important reporting information and to generate tabular emissions totals for both specific refinery process units and for the entire refinery. It is not necessary for the user to possess a rigorous understanding of Excel® to use APIDRAIN; only a few common principles of the Windows® operating environment are needed (such as point-and-click and navigation of tab and arrow keys). See also Publs 4639, 4677, and 4678. Pages: 92

April 1999 | Product Number: I46810 | Price: $400.00

Validation of Heavy Gas Dispersion Models with Experimental Results of the Thorney Island Trials
Volumes I & II

June 1986

Publ 4713
Test Report: Fluidized Catalytic Cracking Unit at a Refinery (Site A), Characterization of Fine Particulate Emission Factors and Speciation Profiles from Stationary Petroleum Industry Combustion Sources

There are few existing data on emissions and characteristics of fine aerosols from petroleum industry combustion sources, and the limited information that is available is incomplete and outdated. The American Petroleum Institute (API) developed a test protocol to address this data gap, specifically to:

- Develop emission factors and speciation profiles for emissions of primary fine particulate matter (i.e. particulate present in the stack flue gas including condensable aerosols), especially organic aerosols from gas-fired combustion devices; and
- Identify and characterize secondary particulate (i.e. particulate formed via reaction of stack emissions in the atmosphere) precursor emissions.

This report presents the results of a pilot project to evaluate the test protocol on a refinery fluid catalytic cracking unit (FCCU). Pages 113

March 2002 | Product Number: I47130 | Price: $140.00

Publ 4723
Refinery Stream Speciation

Contains the results of a study to determine the range of compositions for a number of compounds in typical refinery process streams. Data representing 31 refineries, over 20 processes, and over 50 process streams was contributed by the project participants. The results of this project will be of use in estimating the emissions of specific compounds, in preparing permit applications and in other environmental control activities. Neither the Petroleum Environmental Research Forum (PERF) or the project participants make any claims as to the suitability or acceptability of the stream composition data reported for specific reporting or regulatory purposes.

November 2002 | Product Number: I47230 | Price: $159.00

EMISSIONS: VEHICLES

Publ 4605
Investigation of MOBILE5a Emission Factors: Evaluation of IM240-to-FTP Correlation and Base Emission Rate Equations

This document is a detailed investigation and critique of the methodology used by EPA to construct the exhaust emission rate equations in MOBILE5a developed from data collected from an operating I/M program. It includes an extensive critique of the adjustments used to correct I/M program data for variations in fuel characteristics and temperature conditions and an assessment of the correlations developed to relate emissions data measured in an I/M program to that measured on the Federal Test Procedure.

June 1994 | Product Number: I4605 | Price: $59.00

Publ 4637
Analysis of Causes of Failure in High Emitting Cars

This report describes an investigation to evaluate the primary causes of high exhaust emissions from light-duty vehicles on the road. It is an analysis of emissions data from tests previously conducted by the U.S. EPA, the

California Air Resources Board, and one joint EPA-industry program. The analysis involves a comparison of emissions test data collected both before and after the performance of repairs on 1981 and newer cars and trucks. Emission control defects, their prevalence and overall contribution to fleet emissions are described. Pages: 104

February 1996 | Product Number: I46370 | Price: $67.00

Publ 4642
A Study to Quantify On-road Emissions of Dioxins and Furans from Mobile Sources: Phase 2

This report presents the results of a study to assess on-road emissions of dioxins and furans from light- and heavy-duty vehicles in the United States. This study was conducted in response to the U.S. EPA's draft Dioxin Reassessment document, which was based on data developed from studies conducted outside of the United States. Emissions were measured in the Fort McHenry Tunnel in Baltimore, MD, based on techniques tested and proven in Phase 1 of this study. The emission factor determined for heavy-duty diesel vehicles in this work was less than the EPA estimate. Pages: 96

December 1996 | Product Number: I46420 | Price: $126.00

Publ 4646
Evaluation of Fuel Tank Flammability of Low RVP Gasolines

Twenty-two test fuels were varied with respect to Reid vapor pressure (RVP), pentane-to-butane ratio, and addition of ethanol and MTBE, to evaluate the conditions under which vapors from reformulated gasoline contained in automobile fuel tanks become flammable. The results show that temperature limits of flammability correlate with RVP; the addition of ethanol or MTBE or both affects the upper flammability limits; and the ratio of pentane to butane has no consistent effect at similar RVP levels. Pages: 144

December 1996 | Product Number: I46460 | Price: $94.00

Publ 4650
Analysis of High-mileage-vehicle Emissions Data from Late-model, Fuel-Injected Vehicles

Seventy-five light-duty vehicles were procured and tested over the Federal Test Procedure to assess whether the EPA's MOBILE5a on-road emission factors model overpredicted the exhaust emissions of newer-model, fuel-injected vehicles with high mileage. A comparison of the results from vehicles tested in this program to estimates from the EPA MOBILE5a model suggested that the latter may be over-predicting exhaust emissions. This report presents an analysis of the data collected during this project. Pages: 62

February 1997 | Product Number: I46500 | Price: $67.00

EXPOSURE: ASSESSMENT & MONITORING

Publ 4617
A Monte Carlo Approach to Generating Equivalent Ventilation Rates in Population Exposure Assessments

This report describes a study to improve breathing rate simulations in computer-based models used to estimate the exposures of urban populations to ozone and carbon monoxide. Algorithms producing EVR values according to age, gender, activity, activity duration, and breathing rate category were developed from measured rates in primary-school children, high-school children, outdoor adult workers, and construction workers. Seven additional time/activity databases not used in the current pNEM methodology are described as well as models simulating maximum sustainable ventilation rates as a function of exercise duration, age, and gender. Pages: 168

March 1995 | Product Number: I46170 | Price: $76.00

Publ 4619
A Study to Characterize Air Concentrations of Methyl Tertiary Butyl Ether (MTBE) at Service Stations in the Northeast

This report describes a study to measure air concentrations of MTBE, total hydrocarbons, carbon monoxide, formaldehyde, and BTEX at 10 service stations in the New York area. Researchers assessed concentrations of MTBE in the areas around gas pumps, at the station perimeters, and in the breathing zones of motorists and attendants. Meteorological parameters, gasoline composition, sales, and deliveries were also monitored. Pages: 144

February 1995 | Product Number: I46190 | Price: $76.00

Publ 4622
Petroleum Industry Data Characterizing Occupational Exposures to Methyl Tertiary Butyl Ether (MTBE): 1983–1993

This report describes the results of a survey of API member companies to acquire data relating to occupational exposure to MTBE for various activities associated with petroleum facilities. It provides a detailed description of the survey questionnaire as well as a statistical analysis of some 1,833 workplace concentration measurements associated with potential occupational exposures. Pages: 105

August 1995 | Product Number: I46220 | Price: $59.00

Publ 4625
Service Station Personnel Exposures to Oxygenated Fuel Components

This report describes a study in four ozone nonattainment areas to measured exposures of refueling attendants and mechanics to fuel oxygenate species—MTBE, TAME, tertiary butyl alcohol, ethanol, and butyl alcohol—at service stations. The aromatics—benzene, toluene, xylene, para-xylene, and ethylbenzene—were also measured. Full shift (approximately 8-hour time-weighted average) and short-term (15–20 minutes) samples were collected at each station. Volatility and meteorological measurements were also taken. Pages: 144

August 1995 | Product Number: I46250 | Price: $63.00

Publ 4629
Hexavalent Chromium Exposures During Hot Work

This report details the findings from an air sampling survey contracted by the American Petroleum Institute (API) to evaluate inhalation exposures to hexavalent chromium (chromium (VI)) during seven types of hot work: carbon arc cutting (CAC), flux cored arc welding (FCAW), gas metal arc welding (GMAW or MIG), grinding, gas tungsten arc welding (GTAW or TIG), oxyfuel gas cutting (OFC or torch cutting), and shielded metal arc welding (SMAW or stick). After the first edition of this report was published, it was determined that 15 samples from one of the projects were listed as carbon steel base metal and should have been listed as stainless steel. While the original report was careful to point out the use of electrodes typical for stainless work, it was felt that a complete update was needed. Eighty-three samples were collected in October and November 2005 at two petroleum sites during maintenance turnarounds by API member companies. An additional 188 samples were collected April - June 2006 at three different petroleum company sites by ICU Environmental Health and Safety. Of the 271 total samples, 63 samples were at or above the Occupational Safety and Health Administration (OSHA) action level of 2.5 ug/m^3 and 51 were at or above the OSHA permissible exposure limit of 5 ug/m^3. Pages: 12

June 2007 | Product Number: I46290 | Price: $82.00

MODELING

Publ 4546
Hazard Response Modeling Uncertainty (A Quantitative Method): Evaluation of Commonly-used Hazardous Gas Dispersion Models—Volume 2

Volume 2 contains an evaluation of a group of 14 hazardous gas dispersion models. All available measurement programs were considered for the evaluation, covering both the releases of dense gases and nondense tracer

gases; eight data sets are used in the evaluation. The models are reviewed for their scientific validity. Statistical procedures and residual plots are used to characterize performance. A number of the models give predictions that reasonably match field data. Pages: 351

October 1992 | Product Number: I45460 | Price: $137.00

Publ 4628
A Guidance Manual for Modeling Hypothetical Accidental Releases to the Atmosphere

This manual presents methods for modeling hypothetical accidental releases of fluids and gases into the atmosphere from process operations. Given a particular type of release and the chemicals or petroleum fractions involved, methods for modeling the release and subsequent dispersion phenomena are treated in a step-wise, comprehensive manner. Detailed simulation of eight hypothetical release scenarios are presented to demonstrate how the modeling procedures can be implemented. Pages: 212

November 1996 | Product Number: I46280 | Price: $137.00

Publ 4636
HGSYSTEM 3.0: Technical Reference Manual and User's Guide

The Technical Reference Manual is intended as a source of background information for users who want to know more about the technical/scientific contents of the HGSYSTEM modules used to model atmospheric dispersion of neutrally buoyant and heavier-than-air gases. The modules calculate release terms, evaporating liquid pools, jet dispersion, and heavy gas dispersion. The User's Guide contains all the information necessary to run HGSYSTEM and interpret results. The IBM-compatible software provided includes the source and executable codes of HGSYSTEM 3.0. Users require a minimum of a 386 processor, DOS 3.3, 4 MB RAM and 2.5 MB disk space. (Two binders are included.) Pages: 281

November 1995 | Product Number: I46360 | Price: $264.00

Publ 4669
Review of Air Quality Models for Particulate Matter

API has published a review of existing source and receptor models available for analyzing particulate matter (PM) concentrations. This report critically reviews existing air modeling tools for PM, recommends models for State Implementation Plan applications, and identifies areas where the models need improvement. This publication may be downloaded from the EHS web site free of cost: *www.api.org/ehs/Publications/4669.htm*. If you would like API to provide you with a hard copy of this publication for a cost of $40.00, please contact the Information Specialist at the American Petroleum Institute, Regulatory Analysis and Scientific Affairs (RASA) Department, 1220 L Street, NW, Washington, DC 20005; e-mail: ehs@api.org, phone: 202-682-8319. Pages: 311

March 1998

OZONE

Publ 305
Protecting Agricultural Crops from Ozone Exposures—Key Issues and Future Research Directions

This report identifies and reviews some of the key issues related to assessing the effects of ozone exposure on vegetation. This report analyzes information on components of ozone exposure that elicit adverse effects on vegetation; ways to describe these components in the form of ozone exposure indices that may be useful in the standard-setting process for protecting vegetation; the change in nonattainment status that may occur should the existing ozone NAAQS be modified; and the need for future research efforts to explore the development of a suitable multi-parameter index to protect vegetation from ozone exposure. Pages: 156

August 1991 | Product Number: J30500 | Price: $80.00

Publ 309
Current Status and Research Needs Related to Biogenic Hydrocarbons

This review is a description of the literature on the state of science on biogenic hydrocarbons. Among the areas covered are biogenic emission measurements, ambient concentration measurements, emission inventories, chemical kinetics and modeling studies from 1960 to 1992. The results of the review are used to identify areas of understanding as well as uncertainty in present-day knowledge. A list of references with 163 abstracts is included. Pages: 240

June 1992 | Product Number: J30900 | Price: $109.00

Publ 4616
The Importance of Using Alternative Base Cases in Photochemical Modeling

A series of Urban Airshed Model (UAM) sensitivity studies were conducted using two summer O3 episodes. Plausible alternative conditions were established to define acceptable base cases, some of which provided model performance comparable to the best achieved for the episodes. The alternative base cases used in this study produced significant differences in estimates of the air quality benefits of hypothetical emissions reductions. The study strongly recommends that current photochemical modeling practices include this type of analysis to reduce the risk of focusing on the wrong ozone precursor, underestimating control requirements, or incurring costs to implement unnecessary controls. Pages: 364

September 1994 | Product Number: I46160 | Price: $133.00

Environment and Safety Data

Publ 2384
2005 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

This summary reports on cases recordable in 2005 under the US Bureau of Labor Statistics' record keeping guidelines. The survey is based on data submitted to the American Petroleum Institute by oil and gas companies. The report includes information regarding injuries, illness, and fatalities, lost workday cases, and incidence rates by function.

May 2006 | Product Number: K23841 | Price: $100.00

Publ 2383
2004 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2005 | Product Number: K23831 | Price: $100.00

Publ 2382
2003 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

May 2005 | Product Number: K23821 | Price: $100.00

Publ 2381
2002 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

June 2003 | Product Number: K23811 | Price: $100.00

Publ 2380
2001 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2002 | Product Number: K23801 | Price: $100.00

Publ 2379
2000 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2001 | Product Number: K23790 | Price: $100.00

Publ 2378
1999 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

June 2000 | Product Number: K23781 | Price: $100.00

Publ 2377
1998 Summary of Occupational Injuries, Illness, and Fatalities in the Petroleum Industry

March 1999 | Product Number: K23771 | Price: $100.00

Publ 2376
1997 Summary of Occupational Injuries, Illness, and Fatalities in the Petroleum Industry

June 1998 | Product Number: K23761 | Price: $93.00

Publ 2375
1996 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

June 1997 | Product Number: K23751 | Price: $93.00

1995 Summary of U.S. Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

May 1996 | Product Number: K19983 | Price: $93.00

1994 Summary of U.S. Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

June 1995 | Product Number: K19984 | Price: $93.00

1993 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

June 1994 | Product Number: K19985 | Price: $93.00

1992 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

August 1993 | Product Number: K19986 | Price: $80.00

1991 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

September 1992 | Product Number: K19987 | Price: $80.00

1990 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

July 1991 | Product Number: K19988 | Price: $80.00

1989 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

January 1989 | Product Number: K19996 | Price: $57.00

Publ 4714
A Guide to Polycyclic Aromatic Hydrocarbons for the Non-specialist

API Publication 4714 provides an introduction to polycyclic aromatic hydrocarbons (PAHs) for persons working in the petroleum industry. It describes in general terms what PAHs are and how they are formed; PAH environmental transport, fate, and health effects; regulatory requirements related to PAHs; and analytical methods for measuring PAH concentrations in the environment. This information is of particular relevance to the petroleum industry due to the natural presence of PAHs in crude oil, the formation of PAHs during some refining processes, and the potential for production of PAHs during the combustion of petroleum products. The intended audience for this report includes environmental professionals who must address PAH regulatory issues, and field personnel who are responsible for the sampling and analyses of PAHs. Pages: 36

February 2002 | Product Number: I47141 | Price: $76.00

Human Health Related Research

TR 400
Toluene: A Preliminary Study of the Effect of Toluene on Pregnancy of the Rat

This report describes a preliminary experiment performed in the pregnant rat to determine appropriate exposure levels of toluene, for future investigation of embryofetal toxicity in the rat when administered via the inhalation route from days 5 to 15 of pregnancy inclusive. The inhalation route of administration was chosen as the most likely route of exposure in humans. The exposure levels were chosen following a review of currently available information. See related document TR 401. Pages: 113

June 1993 | Product Number: I00400 | Price: $59.00

TR 401
Toluene: The Effect on Pregnancy of the Rat

This report describes a study to assess the toxicity of toluene on the pregnant rat as well as on the developing fetus. Pregnant rats were exposed to 250, 750, 1,500, and 3,000 ppm toluene via inhalation for 6 hours a day from days 6 to 15 of pregnancy. Control rats were exposed to filtered air for the same length of time. Throughout the exposure period, animals were observed for clinical signs of toxicity. On day 20, the females were sacrificed and examined for abnormalities. The number and distribution of live young as well as the number of fetal deaths and abnormalities were also recorded. See related document TR 400. Pages: 215

June 1993 | Product Number: I00401 | Price: $84.00

TR 403
Closed-Patch Repeated Insult Dermal Sensitization Study of TAME in Guinea Pigs

This report describes a study to evaluate the allergic contact sensitization potential of tert-amyl methyl ether (TAME) in guinea pigs. Observations for mortality were made daily. Body weights were obtained and general health monitored weekly. Dermal evaluations were made approximately 24 and 48 hours after exposure. Pages: 32

February 1995 | Product Number: I00403 | Price: $59.00

TR 404
An Inhalation Oncogenicity Study of Commercial Hexane in Rats and Mice, Part I—Rats

This abridged report, the first part of a two-part set, evaluates the oncogenic potential of commercial hexane administered to four groups of 50 Fischer 344 rats at concentrations of 0, 900, 3,000 and 9,000 ppm in air. Summary text as well as pertinent data on changes in body weight, pathology, and individual and overall tumor incidence including differences in survivorship between control and exposed groups are provided. The amendment and table of contents to the unabridged final report are included.

January 1995 | Product Number: I00404 | Price: $76.00

TR 405
An Inhalation Oncogenicity Study of Commercial Hexane in Rats and Mice, Part II—Mice

This abridged report, the second part of a two-part set, evaluates the oncogenic potential of commercial hexane administered to four groups of 50 B6C3F1 mice at concentrations of 0, 900, 3,000 and 9,000 ppm in air. Summary text and pertinent data on differences in survivorship between control and exposed groups, changes in body weight, and pathology are provided. The table of contents to the unabridged final report is included.

January 1995 | Product Number: I00405 | Price: $59.00

TR 409
Primary Skin Irritation Study in Rabbits of API 91-01 and PS-6 Unleaded Test Gasolines

This report describes a study conducted to assess primary dermal irritation data for two motor fuels according to TSCA and FHSA guidelines. Test rabbits were exposed dermally to unleaded gasoline according to a specified protocol and observed daily for signs of skin irritation. Such information is valuable for accurate hazard assessment and first aid treatment. Pages: 58

March 1995 | Product Number: I00409 | Price: $59.00

TR 410
Chromosome Aberrations in Chinese Hamster Ovary (CHO) Cells Exposed to Tertiary Amyl Methyl Ether (TAME)

This study evaluates the clastogenic potential of tertiary amyl methyl ether using Chinese hamster ovary (CHO) cells compared to the solvent control group. Based on the findings of this study, TAME was concluded to be positive for the induction of structural chromosome abberations in CHO cells. Pages: 56

December 1996 | Product Number: I00410 | Price: $84.00

TR 411
Chinese Hamster Ovary (CHO) HGPRT Mutation Assay of Tertiary Amyl Methyl Ether (TAME)

This report describes a study conducted to evaluate the mutagenic potential of the test article, tertiary amyl methyl ether (TAME) based on quantitation of forward mutations at the hypoxanthine-guanine phosphoribosyl transferase (HGPRT) locus of Chinese hamster ovary (CHO) cells. Under the conditions of this study, TAME was concluded to be negative in the CHO/HGPRT Mutation Assay. Pages: 46

December 1996 | Product Number: I00411 | Price: $84.00

TR 412 and 414
A Range-finding Developmental Inhalation Toxicity Study of Unleaded Gasoline Vapor Condensate in Rats and Mice via Whole-body Exposure and an Inhalation Developmental Toxicity Study of Unleaded Gasoline Vapor Condensate in the Rat via Whole-body Exposure

This two-part inhalation study sought to specifically evaluate the potential of unleaded gasoline for developmental toxicity in rodents. The composition of the unleaded gasoline vapor condensate and the treatment pattern used are representative of real-world exposure conditions encountered at service stations and in other occupational settings. The results show that developmentally there were no differences between treated and control groups in malformations, total variations, resorptions, fetal body weight, or viability. Under the conditions of the study, unleaded gasoline vapors did not produce evidence of developmental toxicity. (This volume includes publications TR 412 and TR 414.) Pages: 300

April 1998 | Product Number: I00412 | Price: $94.00

Publ 45592
Results of Toxicological Studies Conducted for the American Petroleum Institute Health and Environmental Sciences Department

This publication lists and provides the results through December 1994 of all toxicological studies performed on petroleum-based materials, including gasoline and gasoline streams, middle distillates, lubes, heavy fuels, solvents, shale oils, and miscellaneous products. It also provides details of the tests performed and the species tested. A three-ring binder is provided to house this edition and future updates. Pages: 190

January 1995 | Product Number: I45592 | Price: $76.00

Publ 4592
Odor Threshold Studies Performed with Gasoline and Gasoline Combined with MTBE, ETBE and TAME

This report examines the effects on odor detection and recognition of adding oxygenates such as MTBE, ETBE, and TAME to gasoline. Commercial grade MTBE is also evaluated for its taste threshold in water. The odor detection threshold is the minimum concentration at which 50 % of a given population can differentiate between a sample containing the odorant and a sample of odor-free air. The recognition threshold is the minimum concentration at which 50 % of a given population can recognize the odorant. The addition of 11 % to 15 % by volume MTBE or 15 % by volume of TAME or ETBE reduce the odor detection and recognition thresholds of gasoline. Pages: 76

January 1994 | Product Number: I45920 | Price: $76.00

Publ 4623
Anecdotal Health-related Complaint Data Pertaining to Possible Exposures to Methyl Tertiary Butyl Ether (MTBE): 1993 and 1994 Follow-up Surveys

This document describes the development and administration of an informal survey of API member companies and state agencies to acquire anecdotal complaint data relating to MTBE exposure. Data associated with 71 occupational and 13 nonoccupational health-related complaints including reported symptoms are presented. Pages: 33

September 1995 | Product Number: I46230 | Price: $59.00

Publ 4634
Index and Abstracts of API Health-related Research

This compendium of health-related research provides author, organization, and subject indices for research investigations and scientific reviews conducted for API between 1959 and 1994. It covers industrial hygiene and exposure assessment, toxicology, environmental biology, product safety, and community and occupational health research areas. Informative abstracts provide useful background on each study and give information on publication availability. Pages: 160

September 1995 | Product Number: I46340 | Price: $76.00

Publ 4647
Brain Glial Fibrillary Acidic Protein (GFAP) as a Marker of Neurotoxicity During Inhalation Exposure to Toluene

This study evaluated the concentration of glial fibrillary acidic protein (GFAP) in the rat's brain as a practical biomarker of toluene-induced neurotoxicity. Adult male rats received inhalation exposure to toluene scheduled to approximate occupational exposure for up to 42 days. During and after exposure, the concentration of GFAP was determined in four brain regions and compared with standard criteria of neurotoxicity: behavioral or neuropathological changes. Pages: 44

June 1997 | Product Number: I46470 | Price: $76.00

Publ 4648
Human Neurobehavioral Study Methods: Effects of Subject Variables on Results

Behavioral tests from two consensus neurotoxicity batteries were administered to 715 subjects aged 26–45. These people had 0–18 years of education and represented the following cultural groups: European-descent majority, Native American Indian, African American, and Latin American. Differences in educational level and locale (rural vs. urban) and gender were examined. All factors affected the outcome of the behavioral tests studied. Results suggested that education and cultural group should be controlled in the design of the study rather than in the statistical analysis, and failure to do so could lead to false conclusions about the presence or absence of neurotoxic effects. Pages: 110

December 1996 | Product Number: I46480 | Price: $94.00

Publ 4689
Chemical Human Health Hazards Associated with Oil Spill Response

Contains an overview of human health hazards that could be encountered by personnel involved with spills or leaks of petroleum products. The discussion includes potential risks of basic components and products of concern. Environmental factors that may affect exposure and a brief summary of other exposure considerations are also included.

August 2001 | Product Number: I46890 | Price: $80.00

Publ 4743
Hazard Narrative for Tertiary-Butyl Alcohol (TBA), CAS Number 75-65-0

The purpose of this investigation was to conduct a quantitative risk assessment according to USEPA guidelines (USEPA 2005) in which data on the mode of action by which TBA induced renal tumors in rats and thyroid tumors in mice was considered. When data from animal studies, such as the TBA bioassays, are extrapolated to humans to provide estimates of lifetime cancer risks, then potential differences in pharmacokinetics (metabolism) and pharmacodynamics (sensitivity and mode of action) between the animal species and humans is considered in the estimation of human equivalent doses and in extrapolation from high doses typically used in the animal bioassays to low doses to which humans may be potentially exposed. Pharmacokinetic, toxicity, and mode of action data for TBA were reviewed and data selected for quantitative dose-response modeling. Pages: 76

November 2005 | Product Number: I47430 | Price: $144.00

Human Factors in New Facility Design Tool

Describes a Human Factors Tool that may be used by operating plants as an aid to incorporate human factors principles in the design of equipment that will be operated and maintained by people.

The human factors principles described in this document are intended for new equipment designs; however, many ideas provided in this Tool may be used to improve the operating of existing plants where feasible.

This document focuses only on equipment design. Items such as human error, behavior-based safety, and operating procedure issues are not in the scope.

The Tool covers equipment that is common to both upstream producing and downstream manufacturing operations. Equipment associated with specific activities such as drilling rigs is not specifically addressed. Pages: 71

2nd Edition | October 2005 | Product Number: I0HF02 | Price: $144.00

Human Factors Tool for Existing Operations

The objectives of this tool include:

- Providing a tool for operating crews to identify opportunities for latent conditions and human error; and
- Improve how Process Hazards Analysis/Hazard Evaluation/Revalidation process address human factors

The scope of this tool includes existing operations and equipment and human tasks.

This tool is intended for use without specific training on human factors. This is a simple process for gathering a few operators and mechanics who are familiar with the equipment/process and who are qualified to identify where traps (latent conditions) in the equipment and tasks (error likely scenarios) exist that make it easy for people to do something wrong.

1st Edition | February 2006 | Product Number: I0HF03 | Price: $60.00

Natural Resource Damage Assessment

Publ 304
Evaluation of Restoration Alternatives for Natural Resources Injured by Oil Spills

This report builds upon previous work in the field of oil spill impact assessment and habitat restoration to assess the technical feasibility and practicality of proactive restoration following oil spills and presents an approach for evaluating tradeoffs between natural recovery and active restoration. The scenarios developed to represent a broad spectrum of possible oil spills were based on selected case studies. The report concludes that in general, available restoration techniques are not very effective for enhancing natural recovery and may, in certain cases, cause more severe impacts than the oil spill alone. Pages: 171

1st Edition | October 1991 | Product Number: J30400 | Price: $80.00

Publ 316
Identifying and Measuring Nonuse Values for Natural and Environmental Resources: A Critical Review

This review takes an in-depth look at the theoretical arguments for using the Contingent Value Method (CVM) as a scientifically valid and reliable tool for valuing nonuse public goods, specifically, environmental resources. The theory of option value is used to frame the concept of nonuse; prominent studies that feature nonuse measurement are highlighted. The potential biases of the CVM method are mentioned with suggestions on improving values. Pages: 134

August 1995 | Product Number: J31600 | Price: $57.00

DR 342
Toxicity Bioassays on Dispersed Oil in the North Sea: June 1996 Field Trials

The purpose of the study described in this report was to gain more information on water column impacts by taking advantage of the ongoing efficacy and monitoring studies done by NOFO in order to conduct field toxicity tests.

The goal of this study was to obtain field effects data using shipboard, real-time toxicity tests with field water. These data can then be used in the future to link field effects to laboratory toxicity data. Pages: 108

June 2002 | Product Number: I34200 | Price: $134.00

Publ 4594
A Critical Review of Toxicity Values and an Evaluation of the Persistence of Petroleum Products for Use in Natural Resource Damage Assessments

This document and accompanying 3.5" diskette provide a review of the literature (post-1970) on the toxicity of crudes and oil products in aquatic environments. Some 748 toxicity values for fish, invertebrates, and algae are assembled into a database—OILTOX. LC50 values can be identified as well as information on taxonomic groups and toxicity endpoints of interest. Key methodological aspects of toxicity tests can be made as well as determinations of which test procedures have a significant impact on results. Users need 640K RAM, DOS 2.0 or higher, and at least a 2MB hard disk. Text may be downloaded onto a diskette and stored as a file or printed. Pages: 196

January 1995 | Product Number: I45940 | Price: $113.00

Publ 4714
A Guide to Polycyclic Aromatic Hydrocarbons for the Non-Specialist

See also, Health and Environmental Issues, Environmental and Safety Data

February 2002 | Product Number: J47141 | Price: $76.00

Pollution Prevention

Publ 300
The Generation and Management of Waste and Secondary Materials in the Petroleum Refining Industry

In 1989, API initiated a census survey of domestic refineries to document the management of waste and secondary materials in 1987 and 1988. Outstanding responses by the refineries (115 out of the total U.S. population of 176 refineries participated) aided in making confident estimates of the amount of waste managed by the U.S. refining industry. Pages: 184

February 1991 | Product Number: J30000 | Price: $71.00

Publ 302
Waste Minimization in the Petroleum Industry: A Compendium of Practices

In early 1988, API undertook a project to develop a compendium of the waste minimization practices for several different segments of the petroleum industry. The compendium discusses a large variety of practices that can and are being utilized by the industry to reduce both the volume and toxicity of wastes. From "good housekeeping practices" for marketing facilities to the recycling of solvents, stormwater, and other traditional waste streams at refineries, the compendium illustrates the various practices available to minimize wastes in the industry. Pages: 152

1991 | Product Number: J30200 | Price: $87.00

Publ 303
Generation and Management of Wastes and Secondary Materials: 1989 Petroleum Refining Performance

This report is a follow-up to Publ 300 and documents the results of the 1989 Refining Solid Waste Survey. The quantitative results of the generation of the 28 waste and residual streams and their management according to the environmental management hierarchy (i.e., source reduction, recycling, treatment and disposal) is presented. In addition, the document contains a discussion of the state of source reduction activities underway within the industry, including a quantitation of source reduction achievements on the 28 streams, and the methods used to calculate source reduction.

June 1992 | Product Number: J30300 | Price: $87.00

Publ 311
Environmental Design Considerations for Petroleum Refining Processing Units

Demonstrates the application of pollution prevention concepts in the design of a refinery crude processing unit. Included are realistic waste and emission reduction changes that would be economically and technically attractive to refiners. The document is intended to serve as a reference for refinery designers during the preliminary design phase of building a new crude unit or revamping an existing crude unit. Pages: 214

February 1993 | Product Number: J31100 | Price: $143.00

Publ 31101
Executive Summary: Environmental Design Considerations for Petroleum Refining Crude Processing Units

This is the executive summary to Publ 311. Pages: 13

February 1993 | Product Number: J31101 | Price: $56.00

Publ 312
Responding to Environmental Challenge: The Petroleum Industry and Pollution Prevention

This document is an informal proceedings of a pollution prevention plenary session held at API's 1990 Health and Environment Annual Meeting. Speakers representing federal and state government, public interest groups, and various petroleum industry segments presented their views on pollution prevention. This document also describes API's initiatives for pollution prevention research. Pages: 16

1990 | Product Number: J31200 | Price: Free*

Publ 317
Industry Experience with Pollution Prevention Programs

The API Pollution Prevention Task Force has been actively involved in promoting pollution prevention within the industry since 1990. Members of the Task Force have accumulated a comprehensive body of knowledge on the subject of pollution prevention and have compiled a resource brochure on the key elements that make pollution prevention programs successful. Pages: 4

June 1993 | Product Number: J31700 | Price: Free*

Publ 324
Generation and Management of Residual Materials: Petroleum Refining Performance

This document is third in a series that presents the results of API's annual survey of the types and amounts of wastes and residuals generated and managed by the petroleum refining industry. For 1990, source reduction activities doubled over the previous year. The quantity of residuals generated increased to 18.2 million wet tons as compared to 16.3 million wet tons in 1989. Much of the increased quantity reflects generation peaks associated with construction and remediation activities. Two long-term trends are worth noting: (1) the amount of total residuals being recycled continues to rise, and (2) the amount of hazardous wastes going to land treatment and disposal continues to fall. Pages: 123

August 1993 | Product Number: J32400 | Price: $87.00

Publ 329
Generation and Management of Residual Materials: Petroleum Refining Performance

This document is the fourth in a series that describes the 1991 data from API's annual survey of the types and amounts of residual materials generated and managed by the refining industry. In 1991, the industry generated 14.8 million wet tons of residual materials—the smallest quantity generated since API began this collection effort in 1987. The industry also reported that pollution prevention activities accounted for a reduction in 715,000 wet tons of materials. A trend analysis was performed on the last 5 years. Oil companies can use the data in this report to compare their residual generation and management practices with the rest of the industry. Pages: 172

June 1994 | Product Number: J32900 | Price: $97.00

Publ 331
Environmental Performance Indicators: Methods for Measuring Pollution Prevention

Presents methods that can be used to measure progress toward pollution prevention. It investigates a series of measurement parameters presented in five categories: program-based, activity-based, mass-based, normalized efficiency, and concentration-based. Within each category of measures, the benefits and limitations are discussed and illustrated with industry examples. Pages: 30

September 1994 | Product Number: J33100 | Price: $61.00

Publ 333
Generation and Management of Residual Materials

This report is the fifth in a series of reports detailing waste and residual and management practices in the refining sector. It presents the results of the 1992–1993 survey and includes information on how the industry has achieved compliance with the land disposal restrictions on RCRA listed hazardous K-wastes (K0448-K052). It also documents the influence of the Primary Sludge rule and new Toxicity Characteristic under RCRA. Pages: 170

February 1995 | Product Number: J33300 | Price: $97.00

Publ 336
Management of Residual Materials: 1994, Petroleum Refining Performance

This report is the sixth in a series of reports presenting the results of the API Annual Refining Survey. It provides a detailed assessment of the size of refinery throughput, the types of crude oil utilized, the regions in which the refineries are located, the types of wastewater treatment processes used, the amounts of different residual streams produced and how they are managed, and the average cost of residual stream management. Pages: 98

August 1996 | Product Number: J33600 | Price: $97.00

Publ 339
Management of Residual Materials: 1995, Petroleum Refining Performance

This report is the seventh in a series of reports presenting the results of the API Annual Refining Residual Survey. Included in the report are detailed assessments of generated quantities and management practices for 14 individual and 2 combined residual streams, trends in management practices, average costs for selected residual stream management, types of wastewater treatment systems employed at refineries, pollution prevention activities, refinery capacities, and regions in which refineries are located. The data in this report indicate a decrease of greater than 25 percent in the quantity of residuals generated by the refining industry from 1994 to 1995. Further, the industry trend towards increased recycling of residuals has continued. In 1995, over half of the refinery residuals generated were recycled rather than being treated or disposed. Pages: 106

July 1997 | Product Number: J33900 | Price: $97.00

Publ 345
Management of Residual Materials: 1996 Petroleum Refining Performance

This report is the eighth in a series of reports presenting the results of the API Annual Refining Residual Survey. Included in the report are detailed assessments of generated quantities and management practices for 14 residual streams representing approximately 80 percent of all residuals managed at U.S. refineries. Industry trend towards increased recycling of residuals has continued. In 1996, well over half of the refinery residuals generated were recycled rather than being treated or disposed. Pages: 106

June 1998 | Product Number: J34500 | Price: $97.00

Soil and Groundwater Research
www.api.org/groundwater

Publ 4722
Groundwater Sensitivity Toolkit—Users Guide, Version 1.0

The American Petroleum Institute and the California MTBE Research Partnership have produced a new software utility to help site managers, water purveyors and regulators evaluate the sensitivity of a groundwater resource to a potential release of compounds of concern (e.g., an MTBE-oxygenated fuel). The toolkit examines three aspects of sensitivity: Resource Value, Receptor Vulnerability and Natural Sensitivity. The user supplies site-specific information and the toolkit returns a "scorecard" addressing the three aspects of sensitivity. Although this utility was designed with petroleum hydrocarbon releases in mind, it can be used when dissolved chlorinated and inorganic compounds are the chemicals of concern. The toolkit runs on Microsoft Excel® and comes with a user's guide. Pages: 51

August 2002 | Product Number: I47220 | Price: $57.00

API Soil and Groundwater Research Bulletins

API Soil and Groundwater Research Bulletins summarize research results from project overseen by API's Soil and Groundwater Technical Task Force. The Task Force disseminates information and research results through publications, presentations and interaction with industry clients and regulatory agencies.

The bulletins listed below can be downloaded from www.api.org/bulletins.

Bulletin No. 24
Downward Solute Plume Migration: Assessment Significance and Implications for Characterization and Monitoring of "Diving Plumes"
April 2006

Bulletin No. 23
The Impact of Gasohol and Fuel-Grade Ethanol on BTX and Other Hydrocarbons in Ground Water: Effect on Concentrations Near a Source
December 2005

Bulletin No. 22
Maximum Potential Impacts of Tertiary Butyl Alcohol (TBA) on Groundwater from Small-volume Releases of Ethanol-blended Gasoline in the Vadose Zone
January 2005

Bulletin No. 21
Evaluation Of Potential Vapor Transport To Indoor Air Associated With Small-volume Releases Of Oxygenated Gasoline In The Vadose Zone
January 2005

Bulletin No. 20
Answers to Frequently Asked Questions About Ethanol Impacts to Groundwater
December 2003

Bulletin No. 19
Evaluation of Small-volume Releases of Ethanol-blended Gasoline at UST Sites
October 2003

Bulletin No. 18
Answers to Frequently Asked Questions About Managing Risk at LNAPL Sites
May 2003

Bulletin No. 17
Identification of Critical Parameters for the Johnson and Ettinger (1991) Vapor Intrusion Model
May 2002

Bulletin No. 16
Migration of Soil Gas Vapors to Indoor Air: Determining Vapor Attenuation Factors Using a Screening-level Model and Field Data from the CDOT-MTL
April 2002

Bulletin No. 15
Vadose Zone Natural Attenuation of Hydrocarbon Vapors: An Emperical Assessment of Soil Gas Vertical Profile Data
December 2001

Bulletin No. 14
Predicting the Effect of Hydrocarbon and Hydrocarbon-impacted Soil on Groundwater
September 2001

Bulletin No. 13
Dissolution of MTBE from a Residually Trapped Gasoline Source
September 2001

Bulletin No. 12
No-purge Sampling: An Approach for Long-term Monitoring
October 2000

Bulletin No. 11
Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE
August 2000

Bulletin No. 10
Simulation of Transport of Methyl Tert-butyl Ether (MTBE) to Groundwater from Small-volume Releases of Gasoline in the Valdose Zone
June 2000

Bulletin No. 9
Non-aqueous Phase Liquid (NAPL) Mobility Limits in Soil
June 2000

Bulletin No. 8
Characteristics of Dissolved Petroleum Hydrocarbon Plumes: Results from Four Studies
December 1998

Bulletin No. 5
Evaluation of Sampling and Analytical Methods for Measuring Indicators of Intrinsic Bioremediation
February 1998

Bulletin No. 3
Ten Frequently Asked Questions About MTBE in Water
March 1998

Bulletin No. 1
Summary of Processes, Human Exposures and Remediation Technologies Applicable to Low Permeability Soils
September 1996

CONTAMINANT FATE AND TRANSPORT

Publ 4531
Chemical Fate and Impact of Oxygenates in Groundwater: Solubility of BTEX from Gasoline-oxygenate Mixtures

Oxygenated hydrocarbon compounds may be added to gasoline mixtures to improve emission quality and octane ratings or to conserve petroleum resources, which may alter the behavior of dissolved organic compounds in groundwater following a fuel spill. This study evaluates the effects of oxygenate additives such as methanol or methyl-tertiary-butyl ether (MTBE) on the aqueous solubility of dissolved aromatic hydrocarbons (benzene, toluene, ethylbenzene, and the isomers of xylene, collectively referred to as BTEX) from gasoline. It also explores the nature of the dissolved contaminant plumes that could develop from a spill of gasoline containing methanol. Pages: 110

August 1991 | Product Number: I45310 | Price: $59.00

Publ 4593
Transport and Fate of Non-BTEX Petroleum Chemicals in Soils and Groundwater

This literature survey documents available information on the chemical composition of petroleum products and the subsurface fate and transport of selected non-BTEX constituents of these products. The evaluation focuses on a representative group of 12 hydrocarbons and hetero-organic compounds based on their abundance in petroleum products and anticipated future interest from regulatory agencies.

September 1994 | Product Number: I45930 | Price: $63.00

Publ 4601
Transport and Fate of Dissolved Methanol, MTBE and Monoaromatic Hydrocarbons in a Shallow Sand Aquifer

This report describes a field investigation into the effect of oxygenates methanol and methyl-tertiary-butyl ether (MTBE) on the fate and transport of benzene, toluene, ethylbenzene, and xylene (BTEX) in groundwater. Natural gradient tracer experiments were conducted to simulate the transport of dissolved plumes resulting from subsurface releases of oxygenated fuels. In these experiments, methanol, MTBE, and BTEX concentrations were monitored by sampling from a dense network of multilevel piezometers, and plume contours were mapped through application of moment analysis. A laboratory study on the effects of methanol and MTBE on the biodegradation of BTEX in groundwater was also conducted. The relative mobility and persistence of BTEX and the oxygenates were characterized based on field and laboratory study data. Pages: 338

April 1994 | Product Number: I46010 | Price: $119.00

Publ 4627
In-situ and On-site Biodegradation of Refined and Fuel Oils: A Review of Technical Literature 1988–1991

This report reviews more than 200 technical articles published between 1988 and 1991 in the area of on-site and *in-situ* bioremediation of petroleum hydrocarbons. It focuses specifically on current field and laboratory research related to petroleum hydrocarbon biodegradation including biodegradation of crude oil and solvents. Recent work in fate and transport modeling that can be applied to petroleum hydrocarbon contamination in groundwater is also covered. The review is designed to complement an earlier (pre-1988) review published by the U.S. Navy. Pages: 146

June 1995 | Product Number: I46270 | Price: $59.00

Publ 4633
Barium in Produced Water: Fate and Effects in the Marine Environment

Provides a summary of what is currently known about the physical and chemical behavior of barium in produced water and in the ocean. It discusses the factors that influence the rate of precipitation of barium as barite. The toxicity of barium to marine and freshwater organisms and humans is discussed in relation to the concentrations and forms in which it occurs in aquatic environments. Pages: 68

September 1995 | Product Number: I46330 | Price: $57.00

Publ 4643
Estimation of Infiltration and Recharge for Environmental Site Assessment

A Risk-Based Corrective Action analysis of a site suspected of chemical contamination requires site-specific knowledge of the rate water infiltrates through the soil to the water table. A comprehensive discussion of the current physical/chemical methods and mathematical models available to quantify those rates along with suggestions for selecting an appropriate technique, depending on site conditions, are provided in this report. Pages: 204

July 1996 | Product Number: I46430 | Price: $94.00

Publ 4654
Field Studies of BTEX and MTBE Intrinsic Bioremediation

A gasoline release field site in the Coastal Plain of North Carolina was monitored for more than 3 years to allow calculation of *in-situ* biodegradation rates. Laboratory microcosm experiments were performed to further characterize the biodegradation of BTEX and MTBE under ambient, *in-situ* conditions. Finally, groundwater modeling studies were conducted to facilitate the interpretation of field data and to evaluate various approaches for predicting the fate and effects of these gasoline constituents in the subsurface. Pages: 244

October 1997 | Product Number: I46540 | Price: $76.00

Publ 4674
Assessing the Significance of Subsurface Contaminant Vapor Migration to Enclosed Spaces—Site-specific Alternative to Generic Estimates

Vapors in enclosed spaces pose two levels of concern. First, enclosed-space vapors may be found at concentrations near those that pose immediate flammability and/or health risks. These sites warrant immediate attention and response as required by most state and federal regulatory guidance. In the second class of sites, concentrations are lower and the concern is for longer term health risks. This report focuses exclusively on this second class of sites, where advection and diffusion occur through a soil layer and into an enclosed space, and time is available to adequately address the problem on a site-specific basis. The options considered in this document include:

- Direct measurement through sampling of enclosed-space vapors,
- Use of near-foundation or near-surface soil gas sampling results,
- Use of site-specific homogeneous and layered soil diffusion coefficients in generic algorithms, and
- Assessment of bioattenuation potential. Pages: 56

December 1998 | Product Number: I46740 | Price: $76.00

Publ 4734
Modeling Study of Produced Water Release Scenarios

This document provides a scientific basis for operators, regulators and landowners to determine if assessment or remediation of produced water releases will provide a meaningful environmental benefit.

The two principal research objectives of this study are (i) the identification of produced water release scenarios that have a potential to cause ground water quality impairment in homogeneous subsurface geologic profiles, and (ii) the prediction of chloride movement through the vadose zone for different release scenarios. Secondary objectives of the study included evaluation of the effect of heterogeneity on the migration of chloride through the vadose zone, the impact of repeat releases and the effect on ground water quality of surface soil restoration by revegetation and soil leaching.

The sensitivity analysis performed in this study provides an overview of the likelihood of groundwater impairment for large release volumes (100 bbls and 10,000 bbls). Assuming homogeneous unsaturated zone soil profiles, the results of over 1000 modeled release scenarios reveal that 49% of single-event releases do not cause impairment of ground water above drinking water standards for chloride (250 mg/L) in a monitoring well that is adjacent to the edge of the release. In 70% of these scenarios, chloride concentrations in ground water do not exceed 1000 mg/L. Although these numbers give no information about the fate of chloride from a specific produced water release, they do indicate that a release does not necessarily cause ground water impairment. Pages: 124

January 2005 | Product Number: I47340 | Price: $119.00

Publ 4741
Collecting and Interpreting Soil Gas Samples from the Vadose Zone: A Practical Strategy for Assessing the Subsurface-vapor-to-indoor-air Migration Pathway at Petroleum Hydrocarbon Sites

This document covers the collection of soil gas samples for assessing the significance of the subsurface-vapor-to-indoor-air exposure pathway. While soil gas collection is not the only means of assessing this pathway, it plays a prominent role in many regulatory guidance documents.

This document allows for flexibility in the selection and refinement of practicable and defensible sampling methods. The focus is on identifying key issues associated with soil gas sampling and data interpretation. Field project managers should find this document of use when developing scope-of-work requirements for site-specific work plans and bid requests.

Topics covered in the document include:

- soil gas transport, with emphasis on petroleum hydrocarbon vapors, including a brief synopsis of expected soil gas profiles based on empirical analysis of existing data.
- the conceptual vapor-migration model.
- sampling locations, depths, and sampling frequency.
- monitoring installations and sample collection procedures.
- methods of soil gas analysis.
- interpretation of soil gas data.

November 2005 | Product Number: I47410 | Price: $158.00

Publ 4758
Strategies for Addressing Salt Impacts of Produced Water Releases to Plants, Soil, and Groundwater

The exploration and production (E&P) industry uses great care during the handling and disposal of the produced water that is generated as part of oil and gas production. However, unintentional releases can occur. Depending on the chemical composition of the produced water and the nature of the local environment, salts associated with such releases can impair soils, vegetation, and water resources.

Provides a collection of simple rules of thumb, decision charts, models, and summary information from more detailed guidance manuals to help you address the following assessment and response issues:

- Will a produced water release cause an unacceptable impact on soils, plants, and/or groundwater?
- In the event of such an impact, what response actions are appropriate and effective? Pages: 29

1st Edition | September 2006 | Product Number: I47580 | Price: $67.00

Publ 4774
The Environmental Behavior of Ethylene Dibromide and 1,2 Dichloroethane in Surface Water, Soil, and Groundwater

Reviews the available environmental fate literature for two compounds, ethylene dibromide (EDB) and 1,2 dichloroethane (1,2 DCA). While these particular names suggest that these two compounds have different structures, EDB and 1,2-DCA are structurally similar. Neither compound contains a double bond despite the common names of ethylene dibromide and ethylene dichloride. The two structures differ only with the presence of either bromine or chlorine substituents.

EDB was previously used as a soil fumigant and as a leaded gasoline additive while 1,2-DCA is currently produced in large quantities as a commercial chemical (nearly 8.2 billion kilograms in the mid-1990s) with most of this, >96 %, used as a chemical intermediate. 1,2-DCA was also used as a leaded gasoline additive. The current presence of 1,2 DCA in air, surface water, and groundwater samples can be attributed mainly to its high production volume. EDB is not typically found in recent air or surface water samples since its use as a soil fumigant and leaded gasoline additive are no longer permitted by the U.S. EPA. However, it has been reported in groundwater and soil samples affected by historical uses.

Provides a review of environmental fate data for both compounds as well as monitoring data from sites where direct release occurred and from larger monitoring studies where concentrations cannot be attributed to a single release. Section II briefly describes the literature search process. Section III contains all available environmental information for EDB while Section IV contains the available information for 1,2 DCA. Within Sections III and IV, transport processes are considered initially, followed by abiotic and biotic transformation processes, and then monitoring data. While EDB and 1,2 DCA are considered separately, the environmental processes relevant for each compound are expected to be similar. For example, the physical trapping of pure EDB by soil samples was well studied because of its use as a soil fumigant. Similar studies were not conducted for 1,2 DCA; however, based on the mechanism reported for EDB and the structural similarity of the two compounds, it is likely to be important for 1,2 DCA as well. In such cases, the reader is referred back to the relevant section of the report where the original data are reported.

available for download at www.api.org

REMEDIAL TECHNOLOGIES

DR 225
Remediation of a Fractured Clay Till Using Air Flushing: Field Experiments at Sarnia, Ontario

This study was conducted over a 3-year period at a well-characterized test site located in Canada near Sarnia, Ontario. A synthetic gasoline blend of known mass, volume, and composition was released into a test cell. Samples were collected and analyzed for gasoline range organics to establish the three-dimensional distribution of the release. Conventional air flushing technologies, soil vapor extraction (SVE) and *in-situ* air sparging (IAS), were able to remove ~40% of the spilled mass during the initial 2 months of operation. Following active remediation, primarily low-volatility compounds remained in the soil and almost no benzene or toluene remained. Based on mass balance data, a significant portion of the BTEX compounds was biodegraded. Pages: 220

October 1998 | Product Number: I00225 | Price: $94.00

Publ 4525
A Compilation of Field-collected Cost and Treatment Effectiveness Data for the Removal of Dissolved Gasoline Components from Groundwater

This study was conducted to document, summarize, and evaluate cost and treatment effectiveness data for air stripping and carbon adsorption systems designed to remove dissolved petroleum hydrocarbons from groundwater. The compounds of primary interest were benzene, toluene, ethylbenzene, and xylene isomers (BTEX) as well as the oxygenates methyl-tertiary-butyl ether (MTBE) and isopropyl ether (IPE). Operating data were gathered from 57 field sites throughout the United States, and treatment system profiles were generated for each site. The data will be used to assist companies in planning pump-and-treat remediation systems for removal of BTEX and oxygenates from groundwater. Pages: 240

November 1990 | Product Number: I45250 | Price: $76.00

Publ 4609
In-situ Air Sparging: Evaluation of Petroleum Industry Sites and Considerations for Applicability, Design and Operation

This report describes the important literature findings as well as the hands-on experiences of the petroleum industry at 59 air sparging sites. Design and operational data are analyzed for relationships that can be used to optimize the technology or provide a better understanding of its fundamental processes. Topics covered include: site characterization; pilot testing; system design and installation; and system operation, monitoring, and performance. Pages: 132

May 1995 | Product Number: I46090 | Price: $94.00

Publ 4631
Petroleum Contaminated Low Permeability Soil: Hydrocarbon Distribution Processes, Exposure Pathways and In-situ Remediation Technologies

This report presents a set of 10 papers on light nonaqueous phase liquids (LNAPLs) in low permeability soils. Collectively, the papers address four key areas: (1) processes affecting the migration and removal of LNAPLs; (2) exposure potential posed by clay soil and hydrocarbons via soil, groundwater, and air pathways; (3) models for predicting LNAPL removal; and (4) techniques of remediation. Pages: 298

September 1995 | Product Number: I46310 | Price: $84.00

Publ 4655
Field Evaluation of Biological and Non-biological Treatment Technologies to Remove MTBE/Oxygenates from Petroleum Product Terminal Wastewaters

A pilot/demonstration study was conducted on three treatment technologies—the fluidized bed biological reactor process, the activated sludge process incorporated with iron flocculation, and the ultraviolet light/hydrogen peroxide process—to evaluate their effectiveness in the treatment of petroleum marketing terminal wastewater contaminated with methyl-tert-butyl ether (MTBE). Contaminated groundwater was the primary constituent of the wastewater, which also contained benzene, toluene, xylenes, and ethylbenzene (BTEX). All three technologies were able to remove at least 95 percent of the MTBE and BTEX in the feed waters. Pages: 194

August 1997 | Product Number: I46550 | Price: $119.00

Publ 4671
Technical Bulletin on Oxygen Releasing Materials for In-situ Groundwater Remediation

Oxygen Releasing Materials (ORMs) are commercially available materials that are being used to enhance bioremediation treatment of petroleum hydrocarbon contaminated groundwater aquifers. This technical bulletin provides a systematic approach for evaluating the utility of ORM treatment and for designing ORM installations. It summarizes the current state of understanding of this technology to provide guidance for site managers evaluating options for enhanced groundwater remediation. Pages: 52

July 1998 | Product Number: I46710 | Price: $67.00

Publ 4715
Evaluating Hydrocarbon Removal from Source Zones and its Effect on Dissolved Plume Longevity and Concentration

Provides valuable information and utilities for regulators and practitioners interested in understanding the possible benefits of free-product removal. This report provides theory and concepts needed to evaluate LNAPL source distribution, chemistry, dissolution and the effects various remediation strategies may have on risk-reduction for the groundwater and vapor exposure pathways. The companion software, API-LNAST, links the multiphase and chemical processes controlling *in-situ* LNAPL distribution, mobility, and cleanup to quantify estimates of the time-dependent concentrations within the LNAPL source and the down gradient dissolved plume. API-LNAST users can screen whether incremental LNAPL removal provides any risk-reduction benefit over a time frame of interest, e.g. 30 years.

September 2002
The report and software can be downloaded from API's website: www.api.org/lnapl

Publ 4730
Groundwater Remediation Strategies Tool

This guide provides strategies for focusing remediation efforts on 1) the change in contaminant mass flux in different subsurface transport compartments (e.g. the vadose zone, smear zone or a zone within an aquifer of interest) and 2) the change in remediation timeframe.

In this approach, groundwater flow and contaminant concentration data are combined to estimate the rate of contaminant mass transfer past user-selected transects across a contaminant plume. The method provides the user with a means to estimate the baseline mass flux and remediation timeframe for various transport compartments and then evaluate how different remedies reduce the mass flux and the remediation timeframe in each transport compartment. Pages: 71

December 2003 | Product Number: I473000 | Price: $123.00

Publ 4760
LNAPL Distribution and Recovery Model (LDRM)

The API LNAPL Distribution and Recovery Model (LDRM) simulates the performance of proven hydraulic technologies for recovering free-product petroleum liquid releases to groundwater. The LDRM provides information about LNAPL distribution in porous media and allows the user to estimate LNAPL recovery rates, volumes and times. Documentation for the LDRM is provided in 2 volumes. Volume 1 - Distribution and Recovery of Petroleum Hydrocarbon Liquids in Porous Media documents the LDRM and provides background information necessary to characterize the behavior of LNAPL in porous media with regard to performance of LNAPL liquid recovery technologies. Volume 2 - User and Parameter Selection Guide provides step-by-step instructions for the LDRM software. Four example problem applications are presented which highlight model use, parameter estimation using the API LNAPL Parameters Database, and limitations of scenario-based models.

January 2007 | Software and documentation can be downloaded from API's web site: groundwater.api.org/lnapl

SITE CHARACTERIZATION

Publ 4599
Interlaboratory Study of Three Methods for Analyzing Petroleum Hydrocarbons in Soils

This report presents the results of an interlaboratory study of three methods—Diesel-Range Organics, Gasoline-Range Organics, and Petroleum Hydrocarbons—used to analyze hydrocarbons in soils. Each method is validated, its performance judged from measurements of accuracy and precision, and practical qualification levels (PQLs) are estimated for each method. The full text of each method is included in the report. Pages: 166

July 1994 | Product Number: I47990 | Price: $94.00

Publ 4635
Compilation of Field Analytical Methods for Assessing Petroleum Product Releases

This report presents a compilation of the most widely used field analytical methods available to perform on-site analyses of organic compounds in soil and groundwater. These methods include total organic vapor analyzers, field gas chromatography, immunoassay, infrared analyzers, and dissolved oxygen/oxidation-reduction potential electrodes. Practical applications and limitations of each method are discussed and an objective-oriented Data Quality Classification Scheme is presented to assist in selecting an appropriate method. Information is also presented on emerging technologies. Pages: 100

December 1996 | Product Number: I46350 | Price: $84.00

Publ 4657
Effects of Sampling and Analytical Procedures on the Measurement of Geochemical Indicators of Intrinsic Bioremediation: Laboratory and Field Studies

This study evaluates the effects of various sampling and analytical methods of collecting groundwater geochemical data for intrinsic bioremediation studies. Sampling and analytical methods were tested in the laboratory and in the field. Several groundwater sampling and analytical methods may be appropriate for measuring geochemical indicators of intrinsic bioremediation. The methods vary in accuracy, level of effort, and cost. Pages: 86

November 1997 | Product Number: I46570 | Price: $59.00

Publ 4658
Methods for Measuring Indicators of Intrinsic Bioremediation: Guidance Manual

This guidance manual is intended to be a resource for practitioners of intrinsic bioremediation in allowing selection of sampling and analytical methods that meet project-specific and site-specific needs in scoping field investigations, provides procedures that will improve the representative quality of the collected data, and considers potential biases introduced into data through the sampling and analytical techniques employed in the site investigation. Pages: 96

November 1997 | Product Number: I46580 | Price: $67.00

Publ 4659
Graphical Approach for Determining Site-specific Dilution-attenuation Factors (DAFs): Technical Background Document and User's Guide

The dilution attenuation factor (DAF) plays a key role in assessing potential impact from the soil-to-groundwater pathway at sites where groundwater quality is, or may be, affected by a leak, spill, or other accidental release of hydrocarbons or other chemicals of concern. A simplistic, graphically-based approach for determining generic and site-specific DAFs was developed, allowing for varying levels of site specificity. Currently, to develop a DAF, one must make complicated calculations by hand or use computer-based modeling software. This publication consists of two documents. The first document describes the technical basis for the *Graphical Approach* for *Determining Site-Specific Dilution-Attenuation Factors*. The second document, the *User's Guide*, provides a concise set of instructions for use of the graphical approach. Pages: 233

February 1998 | Product Number: I46590 | Price: $113.00

Publ 4668
Delineation and Characterization of the Borden MTBE Plume: An Evaluation of Eight Years of Natural Attenuation Processes

In 1988, a natural gradient tracer test was performed in the shallow sand aquifer at Canada Forces Base (CFB) Borden to investigate the fate of a methyl-tertiary-butyl-ether (MTBE) plume introduced into the aquifer. Solutions of groundwater mixed with oxygenated gasoline were injected below the water table along with chloride (Cl^-), a conservative tracer. The migration of benzene, toluene, ethylbenzene, the xylenes (BTEX); MTBE; and Cl^- was monitored in detail for about 16 months. The mass of BTEX in the plume diminished significantly with time due to intrinsic biodegradation. MTBE, however, was not measurably attenuated. In 1995–1996, a comprehensive groundwater sampling program was undertaken to define the mass of MTBE still present in the aquifer. Only about 3 percent of the initial MTBE mass was found, and it is hypothesized that biodegradation played an important role in its attenuation. Additional evidence is necessary to confirm this possibility. Pages: 88

June 1998 | Product Number: I46680 | Price: $59.00

Publ 4670
Selecting Field Analytical Methods—A Decision-tree Approach

This publication presents a decision-tree approach for selecting and using field analytical methods for on-site analyses of organic compounds in soil, groundwater, and soil gas samples at petroleum release sites. This approach will assist project or site managers with guidance for on-site investigations from initial site assessment to site closure. The decision tree charts are supported by quality control packages to increase the credibility of the data by documenting method performance. The publication also provides training suggestions for personnel who will perform the testing. Easy to use checklists for field quality control and formal documentation are included. Pages: 88

August 1998 | Product Number: I46700 | Price: $84.00

Publ 4699
Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE

Applies the principles of risk-informed decision making to the evaluation of MTBE-affected sites by adding exposure and risk considerations to the traditional components of the corrective action process. The risk factors at a given site are evaluated through a "Conceptual Site Model", which is an inventory of all known or potential oxygenate sources, pathways, and receptors. Based on these risk factors, three levels of assessment are defined: standard, limited, and detailed. The appropriate level of assessment is initially determined based on receptor data, which can typically be obtained from a survey of nearby wells and land uses. A subsurface investigation may then be conducted to obtain information on sources and pathways. The level of assessment can be "upgraded" or "downgraded" as warranted by the resulting source and pathway information. Includes a review of the chemical properties and subsurface behavior of MTBE and other oxygenated fuel additives. It also provides an overview of characterization monitoring issues at oxygenate release sites, as well as a detailed review of the tools and techniques used for subsurface assessment. The expedited site assessment process and the use of modern direct-push tools are particularly emphasized, since these approaches are especially well suited for use at MTBE-affected sites.

June 2000 | www.api.org/mtbe

Publ 4709
Risk-Based Methodologies for Evaluating Petroleum Hydrocarbon Impacts at Oil and Natural Gas E&P Sites

The process of calculating human health risk-based screening levels for total petroleum hydrocarbons (TPH) is described in an easy-to-understand question and answer format. (Risk-based screening levels [RBSLs] are chemical-specific concentrations in environmental media that are considered protective of human health.) Risk assessment concepts developed by the EPA, and research groups such as the Petroleum Environmental Research Forum (PERF) and the Total Petroleum Hydrocarbon Criteria Working Group (TPHCWG), are used to calculate RBSLs for TPH in crude oil and condensates obtained from around the world. These methodologies were also applied to polyaromatic hydrocarbons (PAHs), metals, and benzene in TPH. Additional resources contained in this manual include a description of the physical and chemical characteristics of crude oil, condensate, and E&P wastes (contrasted with refined products), a summary of the federal regulatory status of E&P wastes, and a listing of key equations used for calculating RBSLs.

February 2001 | Product Number: I47090 | Price: $80.00

Publ 4711
Methods for Determining Inputs to Environmental Petroleum Hydrocarbon Mobility and Recovery Models

This publication is an invaluable reference for operators, consultants and regulators responsible for cleanup of subsurface petroleum releases. Important fluid and soil property parameters are explained. Methods to measure each parameter are presented in order of relevance for use in environmental free-product mobility/recovery assessments. Fluid property parameters covered include density, viscosity, surface tension and interfacial tension. Laboratory-scale soil property parameters include: capillary pressure vs. saturation, relative permeability vs. saturation, water and non-aqueous phase liquid (NAPL) saturation, Brooks-Corey and van Genuchten model parameters. Field-scale bail-down and production tests are explained and cited. Sample collection and handling procedures are summarized. A listing and abstract of relevant ASTM methods is provided in the appendix.

July 2001 | Product Number: I47110 | Price: $108.00

Publ 4731
Light Non-Aqueous Phase Liquid (LNAPL) Parameters Database—Version 2.0—Users Guide

The Light Non-aqueous Phase Liquid (LNAPL) Parameters Database is a collection of information about samples that have had their capillary parameters determined, as well as other physical parameters measured. Capillary properties are critical in multiphase calculations, and those results have very high sensitivity to these properties. The primary purpose of this database is to provide information to users who are trying to characterize the movement and distribution of LNAPL within a site that has a limited set of direct observations of the capillary properties of the site. Other databases of related parameters have typically been derived from measurements in the agricultural or the petroleum extraction industries; neither being necessarily representative of near-surface environmental conditions. This database give the user the opportunity to understand the range of capillary characteristics observed at sites that are geologically similar, but where there are more direct and laboratory observations available.

December 2003 | Product Number: I47310 | Price: $123.00
The database is available from API's website:
http://groundwater.api.org/lnapldatabase.

Publ 4739
API Interactive LNAPL Guide—Version 2.0

The API Interactive LNAPL Guide is a comprehensive and easy-to-use electronic information system and screening utility. The Guide is designed to provide an overall approach for evaluating LNAPL at a site; assessing its potential risk, quantitatively defining mobility and recoverability, developing remedial strategies, and examining methods to enhance site closure opportunities.

The Guide includes:

- 11 primers covering all aspects of LNAPL from LNAPL basics to remediation
- 14 assessment tools, including API-LNAST Version 2.0, "Charbeneau" spreadsheets for LNAPL recovery (August 2003), the API LNAPL Parameter Database
- LNAPL decision-making frameworks
- Videos and animated figures
- An extensive reference list

August 2004 | The Guide is available from API's web site:
http://groundwater.api.org/lnaplguide

Publ 4761
Technical Protocol for Evaluating the Natural Attenuation of MtBE

This technical protocol addresses data collection, evaluation, and interpretation procedures that consider the physical, chemical and biological properties of MtBE and other oxygenates and degradation byproducts. A tiered approach is provided that can be used by stakeholders to interpret several lines of evidence to evaluate natural attenuation on a site-specific basis. Several resources are provided to support an MNA evaluation, including:

- a review of basic scientific principles relevant to the evaluation of MtBE natural attenuation, including biodegradation and physicochemical attenuation mechanisms;
- a discussion of data that can be used to assess MtBE (and other oxygenates or degradation byproducts) natural attenuation;
- technical references for relevant chemical properties, analytical methods, and field sampling techniques;

- guidance for data quality assurance and interpretation, including statistical analysis; and
- guidance on the presentation of natural attenuation data/information to facilitate regulatory and other stakeholder review and acceptance of MNA remedies.

May 2007 | available from API's web site at: www.api.org/mtbe

Environmental Stewardship Program Publications

Promoting Partnerships
Cooperation Between the Petroleum Industry and Environmental, Educational and Community Groups

Features over 300 examples of partnerships provided by API member companies that demonstrate efforts aimed at one of the key objectives of the industry's Environmental Stewardship Program—to build sustained understanding and credibility with a broad range of industry stakeholders. This report is organized into three categories: environmental, educational, and community partnerships.

September 1996 | Product Number: R90013 | Price: First five free* Additional copies are $15.00

RP 75
Development of a Safety and Environmental Management Program for Offshore Operations and Facilities

Provides guidance for use in preparing safety and environmental management programs (SEMP) for oil, gas, and sulphur operations and facilities located on the outer continental shelf (OCS). These guidelines are applicable to well drilling, servicing, and production; and pipeline facilities and operations that have the potential for creating a safety or environmental hazard at OCS platform sites. Eleven major program elements are included for application to these facilities and operations. Identification and management of safety and environmental hazards are addressed in design, construction, startup, operation, inspection, and maintenance of new, existing, and modified facilities Pages: 41

3rd Edition | May 2004 | Product Number: G07503 | Price: $86.00
Free PDF available at www.api.org

Publ 4714
A Guide to Polycyclic Aromatic Hydrocarbons for the Non-specialist

See also, Health and Environmental Issues, Environmental and Safety Data

February 2002 | Product Number: I47141 | Price: $76.00

RP 9000
Management Practices, Self-assessment Process, and Resource Materials

This document can be used to bridge API's Environmental, Health and Safety Mission and Guiding Principles and individual company activities aimed at improving environmental, health, and safety performance. The self-assessment process provides a mechanism for measuring progress in implementing the management practices. The management practices, self assessments, and resource materials are organized around the following strategic elements: pollution prevention; operating and process safety; community awareness; crisis readiness; product stewardship; proactive government interaction; and resource conservation.

2nd Edition | October 1998 | Product Number: R90002 | Price: $80.00

Publ 9100
Model Environmental, Health and Safety (EHS) Management System and Guidance Document

The Model Environmental, Health and Safety (EHS) Management System and Guidance Document comes with a binder complete with both API Publ 9100A and API Publ 9100B—see descriptions listed below.

October 1998 | Product Number: R9100S | Price: $152.00

Publ 9100A
Model Environmental, Health and Safety (EHS) Management System

This document is intended to be used as a voluntary tool to assist companies interested in developing an EHS management system or enhancing an existing system. The model, which applies a quality systems approach to managing EHS activities, focuses on people and procedures by pulling together company EHS policies, legal requirements, and business strategies into a set of company or facility expectations or requirements.

(Please refer to the companion document, API Publ 9100B, *Guidance Document for Model EHS Management System*, for additional information. Publ 9100A and Publ 9100B are intended to be companion documents, and can be purchased as a set, or individually.)

October 1998 | Product Number: R9100A | Price: $73.00

Publ 9100B
Guidance Document for Model EHS Management System

The guidance document provides assistance to corporate and operating organization employees who are developing, implementing, and assessing environmental, health and safety management systems. It intends to serve as self-study source material, enhances efficiency of interchange among employees by use of common terminology, clarifies relationships between operating and other systems, describes how to evaluate effectiveness of an EHS management system and its elements, and facilitates system continuity over time. [Those using this guidance document should be familiar with API Publ 9100A *Model Environmental, Health and Safety (EHS) Management System*. Publ 9100A and Publ 9100B are intended to be companion documents and can be purchased as a set, or individually.]

October 1998 | Product Number: R9100B | Price: $105.00

API Guiding Environmental Principles and Management Practices
Synopsis of API Recommended Practice 9000

A synopsis of API RP 9000 that summarizes the purpose of the management practices and self-assessment process and presents each a set of management practices. (It does not include self-assessment forms or resource materials.)

December 1993 | Product Number: R90005 | Price: Free*

Collecting and Recycling Used Motor Oil

A pamphlet that briefly describes the used oil program and provides a list of states that have adopted the API state model legislation encouraging collection and recycling of used oil. Included are some tips on preparing used motor oil for recycling.

June 1995 | Product Number: R07720 | Price: Free*

Petroleum Industry Environmental Performance
Sixth Annual Report

See also Subscriptions and Information Technology Products, Online Data

Product Number: N10050 | Price: Free for printed copy*

Petroleum Industry Environmental Performance
Fifth Annual Report

See also Subscriptions and Information Technology Products, Online Data

Product Number: N10040 | Price: Free for printed copy*

Petroleum Industry Environmental Performance
Fourth Annual Report

See also Subscriptions and Information Technology Products, Online Data

Product Number: Q10030 | Price: Free for printed copy*

Petroleum Industry Environmental Performance
Third Annual Report

See also Subscriptions and Information Technology Products, Online Data

Price: Free for printed copy*

Petroleum Industry Environmental Performance
Second Annual Report

See also Subscriptions and Information Technology Products, Online Data

Product Number: N10010 | Price: Free for printed copy*

Storage Tank Research

Publ 301
Aboveground Storage Tank Survey: 1989

This report presents a survey of petroleum aboveground storage tanks. Estimates are made of the number, capacity, and age of the tanks in each sector of the petroleum industry. Survey forms and statistical extrapolations methodology are included in the report. Pages: 44

1991 | Product Number: J30100 | Price: $61.00

Publ 306
An Engineering Assessment of Volumetric Methods of Leak Detection in Aboveground Storage Tanks

Provides the results of a leak detection project in aboveground storage tanks which utilized volumetric methods to detect leaks. A series of field tests were conducted on a 114-foot diameter tank that contained a heavy naphtha petroleum product. The analytical and experimental results of this project suggest that volumetric leak detection methods can be used to detect small leaks in aboveground storage tanks.

1991 | Product Number: J30600 | Price: $71.00

Publ 307
An Engineering Assessment of Acoustic Methods of Leak Detection in Aboveground Storage Tanks

This report provides the results of a leak detection project in aboveground storage tanks which utilized acoustic methods to detect leaks. A series of field tests were conducted on a 114-foot diameter tank that contained a heavy naphtha petroleum product. The analytical and experimental results of this project suggest that passive-acoustic leak detection methods can be used to detect small leaks in aboveground storage tanks.

1991 | Product Number: J30700 | Price: $71.00

Publ 315
Assessment of Tankfield Dike Lining Materials and Methods

To assess tankfield materials and methods of containment, API commissioned a review of environmental regulations as well as a survey of candidate liner materials and installation methods to explore the technology base. The study was limited to diked areas surrounding storage tanks. Liner installations for secondary containment underneath tanks were excluded. Pages: 50

July 1993 | Product Number: J31500 | Price: $71.00

Publ 322
An Engineering Evaluation of Acoustic Methods of Leak Detection in Aboveground Storage Tanks

Describes a set of controlled experiments conducted on a 40-ft. diameter refinery tank to determine the nature of acoustic leak signals and ambient noise under a range of test conditions. The features of a leak detection test needed for high performance are explored. The report concludes that accurate and reliable leak detection of aboveground storage tanks can be achieved through the use of acoustic methods.

January 1994 | Product Number: J32200 | Price: $71.00

Publ 323
An Engineering Evaluation of Volumetric Methods of Leak Detection in Aboveground Storage Tanks

Two volumetric approaches to detecting leaks from aboveground storage tanks—precision temperature sensors and mass measurement approaches—are evaluated in this report. A set of controlled experiments on a 117-ft. diameter refinery tank is used to examine the effects of differential pressure on conventional level and temperature measurement systems. The features of a leak detection test needed for high performance are also explored.

January 1994 | Product Number: J32300 | Price: $71.00

Publ 325
An Evaluation of a Methodology for the Detection of Leaks in Aboveground Storage Tanks

This report describes the results of the fourth phase of a program to define and advance the state of the art of leak detection for aboveground storage tanks (ASTs). Three leak-detection technologies are examined—passive-acoustic, soil-vapor monitoring, and volumetric—over a wide range of tank types, petroleum fuels, and operational conditions. This study also assesses the applicability of a general leak detection methodology involving multiple tests and product levels as well as determines the integrity of 14 ASTs using two or more test methods.

May 1994 | Product Number: J32500 | Price: $87.00

Publ 327
Aboveground Storage Tank Standards: A Tutorial

This tutorial presents procedures and examples to help designers, owners, and operators of aboveground storage tanks understand and comply with API's Recommended Practices, Standards, and Specifications concerning leak prevention. These API documents provide requirements designed to minimize environmental hazards associated with spills and leaks. The tutorial also shows how the API inspection and maintenance requirements influence the design of such tanks. It does not attempt to address additional rules and requirements imposed by individual jurisdictions or states. Pages: 70

September 1994 | Product Number: J32700 | Price: $71.00

Publ 328
Laboratory Evaluation of Candidate Liners for Secondary Containment of Petroleum Products

This document provides comparative data on the physical properties of liner materials as a function of their controlled exposure to fuels and/or additives. Six membrane and two clay liners were tested. Project test results were used to rank the liners in terms of vapor permeation and relative changes in properties such as chemical resistance and liquid conductivity measured after immersion. Pages: 142

January 1995 | Product Number: J32800 | Price: $80.00

Publ 334
A Guide to Leak Detection for Aboveground Storage Tanks

Written for terminal managers, tank owners, operators, and engineers, this report provides useful background on leak detection technologies--volumetric, acoustic, soil-vapor monitoring, and inventory control--for aboveground storage tanks. Characteristics affecting the performance of each technology are discussed. Pages: 38

September 1992 | Product Number: J33400 | Price: $71.00

Publ 340
Liquid Release Prevention and Detection Measures for Aboveground Storage Facilities

Written for managers, facility operators, regulators, and engineers involved in the design and selection of facility components and prevention of liquid petroleum releases, this report presents an overview of available equipment and procedures to prevent, detect or provide environmental protection from such releases. Also presented are the advantages, disadvantages, and relative costs, as well as maintenance and operating parameters of various control measures. Pages: 116

October 1997 | Product Number: J34000 | Price: $80.00

Publ 341
A Survey of Diked-area Liner Use at Aboveground Storage Tank Facilities

In 1997, API conducted a survey designed to evaluate the effectiveness of diked-area liner systems and to document operational problems involved with their use. The survey data indicated that the effectiveness of liners in protecting the environment is limited because liner systems frequently fail. The data further showed that there are few releases from aboveground storage tanks that would be addressed by diked-area liners. Because there were few releases, the data do not directly demonstrate the effectiveness or ineffectiveness of liner systems in containing releases; however, it was concluded that measures that prevent aboveground storage tank releases are more effective in protecting the environment and are more cost-effective in the long run. Pages: 32

February 1998 | Product Number: J34100 | Price: $71.00

Publ 346
Results of Range-finding Testing of Leak Detection and Leak Location Technologies for Underground Pipelines

This study reviewed the current leak detection and leak location methods for pressurized underground piping commonly found at airports, refineries, and fuel terminals. Four methods for testing underground pipes of 6 to 18 inches in diameter and 250 feet to 2 miles in length were selected for field demonstration. These technologies were constant-pressure volumetric testing, pressure-decay testing, chemical tracer testing, and acoustic emission testing. No single leak detection system was found to work in all situations; site-specific conditions may affect any method, and combinations of methods may provide the most effective approach. Pages: 252

November 1998 | Product Number: J34600 | Price: $80.00

Publ 353
Managing Systems Integrity of Terminal and Tank Facilities

Although the risk management principles and concepts in this document are universally applicable, this publication is specifically targeted at integrity management of aboveground liquid petroleum storage facilities. The applicable petroleum terminal and tank facilities covered in this document are associated with distribution, transportation, and refining facilities as described in API Std 2610 and API Pub 340.

This document covers the issues of overall risk management, risk assessment, risk ranking, risk mitigation, and performance measures applicable to an overall integrity management program. The appendices include two possible methodologies for conducting a risk assessment and a workbook that can be used to perform the risk assessment method outlined in Appendix A. Pages: 316

1st Edition | October 2006 | Product Number: J35300 | Price: $146.00

Publ 4716
Buried Pressurized Piping Systems Leak Detection Guide

This Study Documentation Report (the Study) analyzes of the performance of different types of leak detection technologies that were applied to buried pressurized piping systems used in airport hydrant fueling and petroleum product terminals. The Study was conducted by Argus Consulting and Ken Wilcox Associates on behalf of the Air Transport Association of America (ATA) and the American Petroleum Institute (API). This report is intended to provide an overview of the Study methodology and results. Pages: 47

April 2002 | Product Number: I47160 | Price: $91.00

Surface Water Research

DR 342
Toxicity Bioassays on Dispersed Oil in the North Sea: June 1996 Field Trials

See also, Health and Environmental Issues, Natural Resource Damage Assessment

June 2002 | Product Number: I34200 | Price: $134.00

Publ 4664
Mixing Zone Modeling and Dilution Analysis for Water-quality-based NPDES Permit Limits

This report is designed to provide an overview of the Environmental Protection Agency's (EPA) policies and technical guidance on the role of mixing zones in the NPDES permitting process;

- present state mixing zone regulations, policies, and guidance;
- introduce important concepts related to the hydrodynamics of effluent dilution in receiving waters and the design of outfall diffusers;
- review available mixing zone models;
- identify EPA sources for the models;
- discuss strategic issues for dischargers to consider when applying models; and
- describe the use of dye tracer studies as alternatives or supplements to mixing zone models. Pages: 176

April 1998 | Product Number: I46640 | Price: $94.00

DR 343
Automated Validation System for the Offshore Operations Committee Mud and Produced Water Discharge Model

This report describes the development of an automated validation system for the Offshore Operators Committee Mud and Produced Water Discharge Model (the "OOC Model"), a computer program that predicts the initial fate of drilling fluids, drill cuttings, and produced water discharged into the marine environment. The system automates the process of validating OOC Model predictive capabilities by comparing model predictions with the results of laboratory and field studies of plume behavior. The system was developed to automate the laborious process of confirming that model code enhancements do not degrade the predictive abilities of the OOC Model. The automated validation system approach described here also serves as a template for routine documentation of discharge model performance that could be applied to other models used by industry, consultants, or regulatory agencies. Two of relevant studies found in a literature search were incorporated into the suite of automated test cases for the OOC Model. Summaries of the data sets used for OOC Model validation were prepared in such a way that they could be used conveniently outside of the automated system to validate of any relevant discharge model.

November 2002 (CD ROM only)

Publ 4672
The Use of Treatment Wetlands for Petroleum Industry Effluents

Treatment wetlands are becoming widely used for cleansing some classes of wastewater effluents. Although the use of treatment wetlands is well established for wastewater categories such as municipal waste, stormwater, agricultural wastewater, and acid mine drainage water, their use in treating a variety of industrial wastewaters is less well developed. Constructed treatment wetlands hold considerable promise for managing some wastewaters generated by the petroleum industry. Several large-scale wetland projects currently exist at oil refineries, and numerous pilot studies of constructed treatment wetlands have been conducted at terminals, gas and oil extraction and pumping stations, and refineries. This report summarizes current information about the use of treatment wetlands for managing petroleum industry wastewaters and also presents background information on the general performance, design, and operation of treatment wetlands based on experience with a variety of wastewater types. Pages: 222

October 1998 | Product Number: I46720 | Price: $94.00

Publ 4676
Arsenic: Chemistry, Fate, Toxicity, and Wastewater Treatment Options

Arsenic is a naturally occurring element in rocks, soils, water, sediments, and biological tissues. It is also present in fossil fuels. Arsenic in the environment has both anthropogenic and natural sources, and certain anthropogenic sources have caused localized adverse effects on ecological systems and human health. Based on extensive review of the literature, this monograph is intended to serve as a reference volume on the sources of arsenic in the environment, the chemistry and fate of arsenic compounds, biomedical effects, the toxicity of arsenic to aquatic and terrestrial species, wastewater treatment options, and regulatory standards for arsenic in the environment. Pages: 196

October 1998 | Product Number: I46760 | Price: $94.00

Publ 4688
Temporary Treatment Options for Petroleum Distribution Terminal Wastewaters

This document provides guidance to terminal operators and engineers in evaluating mobile treatment systems for wastewater generated at petroleum distribution terminals. Some of the variables that must be considered include the characteristics of the wastewater, the permitting process, and contractor experience. This document provides sufficient information to guide an operator/engineer through evaluation of mobile treatment systems, including problem definition, treatment technology selection, contractor selection and implementation.

November 1999 | Product Number: I46880 | Price: $118.00

Publ 4694
Laboratory Analysis of Petroleum Industry Wastewaters

A guidance manual to assist in arranging for and understanding laboratory analysis of petroleum industry wastewaters. Designed for environmental coordinators, managers, corporate staff, and others who must address environmental compliance reporting and regulatory issues. It is also useful for field personnel responsible for obtaining wastewater sample analyses to fulfill environmental regulatory requirements. Guidance and information are provided for setting data quality objectives; planning analyses; selecting a laboratory; and reviewing laboratory reports, detection and quantification limits, quality assurance/quality control practices, method references, method-defined analytes, and statistical calculations. Examples of case studies, laboratory reports, and data calculations are given throughout the manual. Checklists are provided to help users understand, plan, and review laboratory data. Pages: 175

December 1999 | Product Number: I46940 | Price: $118.00

Publ 4695
Understanding and Preparing Applications for Petroleum Facility NPDES Discharge Permits

A manual to assist member companies and others in preparing applications and negotiating with permit authorities for National Pollutant Discharge Elimination System (NPDES) permits for wastewater discharges. The manual is intended to help permittees and permit applicants to understand the permit process from application to final permit, and to provide tools and strategies for assuring that the permit is fair and properly implements the applicable regulations. Much of the information in this manual is based on practical experience with many NPDES permits and applications. Examples and case histories are provided to help the user understand the permit application process.

December 1999 | Product Number: I46950 | Price: $125.00

Publ 4698
A Review of Technologies to Measure the Oil and Grease Content of Produced Water from Offshore Oil and Gas Production Operations

This document identifies and evaluates practical alternative methods for routine monitoring of oil and grease in produced waters. Traditional monitoring methods relied on Freon-113r extraction of oil and grease; however, owing to the phase-out of Freon-113r these methods can no longer be used, and new methods must be sought. This study evaluates two infrared detection methods and one fluorescence detection method for identifying and measuring oil and grease in produced waters. Performance information, and the correlation of analytical results with EPA's hexane extraction method, Method 1664, is provided. Pages: 138

November 1999 | Product Number: I46980 | Price: $118.00

Publ 4717
Predictors of Water-soluble Organics (WSOs) in Produced Water—A Literature Review

API Publication 4717 is a report that reviews the scientific literature on the identity and physical/chemical characteristics of the water-soluble organics (WSOs) in produced water in relation to characteristics of fossil fuels and their reservoirs. Pages: 24

March 2002 | Product Number: I47170 | Price: $71.00

Publ 4721
Analytical Detection and Quantification Limits: Survey of State and Federal Approaches

The purpose of this review was to determine the analytical detection and quantification limit policies of various state agencies. Of particular interest were policies for setting wastewater discharge permit limits at or below detection or quantification limits, for determining compliance with such limits, and for using alternative approaches to determining detection or quantification limits. Although the main focus of this review was on state policies involving water quality issues, included in the review were the policies of programs in other environmental areas as well as in federal regulations and statutes. Pages: 129

June 2002 | Product Number: I47210 | Price: $134.00

Publ 4750
Cyanide Discharges in the Petroleum Industry: Sources and Analysis

Because both industrial and municipal dischargers have been issued NPDES permits with low (5-20 µg/L) effluent limits for cyanide, there has been considerable interest in the reliability of the available test methods at these low concentrations. This report provides guidance on the measurement, as well as the presence and environmental fate, of cyanide compounds and related chemical species in petroleum industry wastewater effluents. Pages: 42

November 2008 | Product Number: I47500 | Price: $91.00

Publ 4756
Interim Permitting Manual—Navigating NPDES Permit Issues on Impaired Waters

This manual addresses many water quality standards issues that facilities may encounter, including existing uses, use attainability analyses (UAAs) to revise designated uses, fish consumption advisories, whole effluent toxicity (WET) criteria, and sediment criteria. The manual will provide guidance on a number of listing issues, including listings due to violations of narrative criteria and fish consumption advisories, delisting, listing waters that are impaired but do not need a TMDL because they are expected to meet standards through other means, and challenging an erroneous listing determination.

The second part of this manual will discuss permitting discharges to impaired waters during the interim period before TMDLs are developed. The manual will describe the development of water quality-based effluent limitations on impaired waters, and will also discuss a number of issues for affected facilities to consider during the permitting process, including timing (when the permit should be issued), watershed permitting, verifying the impairment determination before the permit is issued, other controls available to bring the water into attainment, reasonable potential calculations, voluntary reduction measures, non-numeric effluent limitations, and calculating numeric effluent limitations. Pages: 41

November 2006 | Product Number: I47560 | Price: $73.00

Publ 4736
Identification of Key Assumptions and Models for the Development of Total Maximum Daily Loads

This report is intended to provide the reader with an understanding of the use of models in the development and implementation of total maximum daily loading (TMDL) studies.

The report focuses on the types of models used for TMDLs, the key assumptions underlying the models, how models are selected for specific surface waters and impairments, the data required to apply the models to a specific surface water and impairment, and how the predictive capability of the models is assessed. Pages: 64

November 2006 | Product Number: I47360 | Price: $144.00

Publ 4751
Evaluation of Water Quality Translators for Mercury

Discusses the technical issues and constraints associated with translation of a mercury fish tissue concentration into a water quality criterion, in the use and implementation of the Environmental Protection Agency's fish-tissue-based criterion for methylmercury. The report focuses on available analytical methods for evaluating mercury in fish and water; proposed methods for translating a fish tissue concentration for mercury into a concentration in water; and implementation of the mercury criterion in the development of Total Maximum Daily Loads (TMDLs) and water quality-based effluent limits (WQBELs). Pages: 37

1st Edition | December 2005 | Product Number: I47510 | Price: $67.00

BIOMONITORING

TR 402
Toxicity to Freshwater Alga, Selenastrum capricornutum

This report describes a study conducted to assess the effect of tert-amyl methyl ether (TAME) on the growth of the freshwater alga, Selenastrum capricornutum. At 24-hour intervals, cell counts and observations of the health of the cells were recorded. EC10, EC50, and EC90 values (the concentration of test material which reduced cell densities by 10 %, 50 %, and 90 %, respectively) were calculated based on cell density 72 and 96 hours after exposure. Pages: 76

February 1995 | Product Number: I00402 | Price: $59.00

TR 406
TAME—Acute Toxicity to Daphnids Under Flow-through Conditions

This report describes the measurement of acute toxicity of TAME to Daphnids under flow-through conditions. Nominal concentrations of TAME—690, 410, 250, 150, and 89 mg A.I./L—were maintained in exposure vessels and mean exposure concentrations calculated. Biological observations and physical characteristics were recorded at test initiation, and at 3, 6, 24, and 48 hours. Pages: 76

February 1995 | Product Number: I00406 | Price: $59.00

TR 407
TAME—Acute Toxicity to Mysid Shrimp (Mysidopsis bahia) Under Static Renewal Conditions

This report describes the measurement of acute toxicity of TAME to mysid shrimp under static renewal conditions. Nominal concentrations of TAME—1.6, 4.0, 7.3, 15, 30, and 60 mg A.I./L—were maintained by renewing solutions at 24, 48, and 72 hours of exposure. Observations were recorded at test initiation and every 24 hours until the test was terminated. Pages: 84

February 1995 | Product Number: I00407 | Price: $59.00

TR 408
TAME—Acute Toxicity to Rainbow Trout Under Flow-through Conditions

This report describes the measurement of acute toxicity of TAME to rainbow trout under flow-through conditions. During the test, nominal concentrations of TAME—950, 570, 340, 210, and 120 mg A.I./L—were maintained and mean exposure concentrations calculated. Biological observations and physical characteristics were recorded at test initiation and every 24 hours thereafter until test termination. Pages: 80

February 1995 | Product Number: I00408 | Price: $60.00

Publ 4610
Critical Review of Draft EPA Guidance on Assessment and Control of Bioconcentratable Contaminants in Surface Waters

This document reviews the Environmental Protection Agency's proposed methods and underlying assumptions for assessing bioconcentratable contaminants in petroleum industry effluents. It focuses on the effluent option and its application to NPDES-permitted discharges from oil refineries, petroleum product marketing terminals, and oil/gas production platforms. The review also includes a general evaluation of the suitability of the tissue residue option for evaluating oil industry effluents. Pages: 134

January 1995 | Product Number: I46100 | Price: $67.00

Publ 4656
Bioaccumulation: How Chemicals Move From the Water Into Fish and Other Aquatic Organisms

This report provides an intermediate-level primer on the accumulation of chemicals by aquatic organisms with emphasis on polycyclic aromatic hydrocarbons (PAHs). Key factors governing bioaccumulation are described to enhance understanding of this complex phenomenon. Approaches for assessing the bioaccumulation potential of chemicals are examined and an evaluation of each method's advantages and shortcomings is offered. Pages: 54

May 1997 | Product Number: I46560 | Price: $84.00

Publ 4666
The Toxicity of Common Ions to Freshwater and Marine Organisms

Whole effluent toxicity (WET) tests have become a common tool in the evaluation of effluent for discharge acceptability. Recent investigations have indicated that deficiencies or excesses of "common" ions (inorganic ions that are nearly always present in most aquatic systems at nontoxic concentrations) can cause significant acute or chronic toxicity in WET tests. This report presents the results of a review of toxicological and physiological

data on inorganic ions that have been implicated in causing significant toxicity—bicarbonate, borate, bromide, calcium, chloride, fluoride, magnesium, potassium, strontium, and sulfate. Pages: 114

April 1999 | Product Number: I46660 | Price: $94.00

Publ 4701
Bioaccumulation: An Evaluation of Federal and State Regulatory Initiatives

August 2000 | Product Number: I47010 | Price: $85.00

EFFLUENTS: EXPLORATION & PRODUCTION

DR 351
Proceedings: Workshop to Identify Promising Technologies for the Treatment of Produced Water Toxicity

These proceedings present the discussions, conclusions and recommendations of an API workshop held in October 1994 to identify technologies which could potentially be used for the treatment of produced water toxicity offshore. Background information on the candidate technologies; information on produced water toxicity limitations, characteristics and composition; results of Toxicity Identification Evaluations; and a discussion of the engineering restrictions imposed by offshore platforms are included. Pages: 122

June 1996 | Product Number: I00351 | Price: $70.00

Publ 4611
Interlaboratory Study of EPA Methods 1662, 1654A and 1663 for the Determination of Diesel, Mineral and Crude Oils in Drilling Muds from Offshore and Gas Industry Discharges

This report describes an interlaboratory round-robin study to validate the tiered approach of EPA's three methods—1662, 1654A, and 1663—for monitoring diesel oil in drilling muds. Various extraction methods were evaluated and analytical measurement techniques were tested for measuring diesel oil. Pages: 106

April 1995 | Product Number: I46110 | Price: $70.00

Publ 4633
Barium in Produced Water: Fate and Effects in the Marine Environment

Provides a summary of what is currently known about the physical and chemical behavior of barium in produced water and in the ocean. It discusses the factors that influence the rate of precipitation of barium as barite. The toxicity of barium to marine and freshwater organisms and humans is discussed in relation to the concentrations and forms in which it occurs in aquatic environments. Pages: 68

September 1995 | Product Number: I46330 | Price: $57.00

Publ 4641
Summary of Produced Water Toxicity Identification Evaluation Research

This report summarizes the results of a three-part study to evaluate the ability of EPA proposed toxicity identification evaluations (TIEs) to determine the potential toxicants in produced water from oil and gas production operations in various locations. Factors affecting the results of the TIEs were identified as well as potential toxicants. Suggestions for improving TIE procedures are included. Pages: 102

June 1996 | Product Number: I46410 | Price: $85.00

Publ 4702
Technologies to Reduce Oil and Grease Content of Well Treatment, Well Completion, and Workover Fluids for Overboard Disposal

Product Number: I47020 | Price: $118.00

EFFLUENTS: MARKETING

Publ 4602
Minimization, Handling, Treatment and Disposal of Petroleum Products Terminal Wastewaters

Intended to be a basic guide and information resource for all wastewater operations at petroleum product terminals. It includes the regulatory framework for wastewater issues, a detailed description of the sources of terminal wastewater and associated contaminants as well as guidance on means for analyzing the wastewater situation at a terminal, for minimizing wastewater flow contamination, and for wastewater handling and disposal. Pages: 120

September 1994 | Product Number: I46020 | Price: $126.00

Publ 4665
Analysis and Reduction of Toxicity in Biologically Treated Petroleum Product Terminal Tank Bottoms Water

The objectives of this study were to measure toxicity in biologically treated petroleum product terminal tank bottoms waters, identify the chemical constituents causing that toxicity, identify treatment options, and measure the effectiveness of the treatment techniques in removing the constituents and reducing toxicity. Nine gasoline and two diesel tank bottoms water samples were collected from petroleum product terminals at various geographical locations. The samples were normalized to a fixed chemical oxygen demand, then subjected to biological treatment. Treated samples were tested for acute toxicity in 24-hour exposure tests using Mysidopsis bahia and for chronic toxicity in 7-day static renewal toxicity tests also using Mysidopsis bahia. Biological treatment was observed to effectively remove metals, but produced highly variable degrees of chemical oxygen demand, biochemical oxygen demand, and total organic carbon. Pages: 84

April 1998 | Product Number: I46650 | Price: $76.00

Publ 4673
Impacts of Petroleum Product Marketing Terminals on the Aquatic Environment

This document examines the potential impact of petroleum product marketing terminal (PPMT) wastewater discharges to aquatic environments to ascertain if there is a need for more stringent regulations. Wastewater discharges by PPMTs were evaluated, the constituents normally present in these waste streams were identified, and their possible aquatic impacts were investigated. It was determined that PPMT wastewater discharges pose little environmental risk; therefore, stricter regulations for PPMT dischargers are unwarranted. Pages: 52

April 1999 | Product Number: I46730 | Price: $94.00

Publ 4690
A Guide for the Use of Semipermeable Membrane Devices (SPMDs) as Samplers of Waterborne Hydrophobic Organic Contaminants

The purpose of this document is to provide basic information and guidance on SPMD technology, and its appropriate use in aquatic systems. Emphasis is given to methods, applications, and theoretical issues related to the use of SPMDs for monitoring priority pollutant polycyclic aromatic hydrocarbons (PAHs), but other classes of hydrophobic organic contaminants are covered as well. This document includes key information on SPMD background, rationale, theory and modeling, technical considerations, supplier/source, chemical analysis and quality control, bioassay screening, comparability to biomonitors, examples of use, and sources of addition information. However, covering all potential environmental applications (e.g., vapor phase sampling) and relevant research results is beyond the scope of this work. Finally, use of this guide does not obviate the need for proper review and oversight procedures prior to the initiation of a project with SPMDs.

March 2002 | Product Number: I46900 | Price: $128.00

Publ 4700
Primer for Evaluating Ecological Risk at Petroleum Release Sites

This primer is designed to help site and facility managers acting as site investigators decide how and to what extent to address ecological risks that may result from a release of petroleum products. The focus is on "downstream" operations related to transportation, distribution or marketing of petroleum products, but the general principles may be adapted to other parts of the industry as well. The ecological risk assessment process is briefly described, and guidance is given about the preliminary investigation to assess the possible nature and extent of risk. This information is an initial part of a tiered decision-making process used to determine the depth and breadth of the site investigation.

May 2001 | Product Number: I47000 | Price: $100.00

EFFLUENTS: REFINING

DR 148
Identification of Organic Toxicants in Treated Refinery Effluents

Effluents from five oil refineries were examined for the presence of chronic toxicity caused by nonpolar, organic compounds. U.S. EPA guidelines for Phase I Toxicity Characterization procedures were used. The refinery effluent containing the most nonpolar toxicity was selected for more detailed analyses and identification of the nonpolar toxicants using Phase II procedures. Extraction and elution conditions were modified to increase chronic toxicity recovery and also reduce the complexity of the nonpolar organic effluent fraction containing toxicity. Results showed that simple modifications of U.S. EPA guidance for C_{18} solid phase extraction procedures, combined with proper toxicity testing conditions, successfully tracked and isolated toxicity in an effluent fraction. Findings also indicated that sources of refinery effluent toxicants were a phenol associated with a jet fuel additive, and two brominated organics believed to be reaction products of cooling tower water treatment chemicals, rather than from crude oil constituents. Pages: 64

December 1997 | Product Number: I00148 | Price: $59.00

Publ 352
Management of Residual Materials: 1997 Petroleum Refining Performance

This report is the ninth in a series of reports presenting the results of the API Annual Refining Residual Survey. Included in the report are detailed assessments of generated quantities and management practices for 14 residual streams representing approximately 80% of all residuals managed at U.S. refineries. Prior to the 1997 survey, the management techniques had included recycling to the cat cracker, which referred to routing a residual to a catalytic cracking unit. Further study revealed that the quantity for residuals actually recycled to a cracking unit was very small-perhaps nonexistent–and was therefore deleted from the 1997 survey. Data for prior years were adjusted. Industry trend toward increased recycling of residuals has continued. Pages: 108

September 1999 | Product Number: J35200 | Price: $118.00

OIL SPILLS

Bull D16
Suggested Procedure for Development of a Spill Prevention Control and Countermeasure Plan

See also, Exploration and Production, Voluntary Operating Agreements and Bulletins.

3rd Edition | December 2002 | Product Number: GD1603 | Price: $250.00
Template only: Price: $92.00

Publ 4558
Options for Minimizing Environmental Impacts of Freshwater Spill Responses

Developed for contingency planners and field responders, this guide provides information on 29 response methods and classifies their relative environmental impact for combinations of 4 oil types and 12 freshwater environments and habitats. Spill topics of concern in freshwater settings are discussed, including public health, conditions under which oil might sink in freshwater, oil behavior in ice conditions, permafrost, and firefighting foam use. Pages: 146

February 1995 | Product Number: I45580 | Price: $84.00

Publ 4640
Petroleum in the Freshwater Environment: An Annotated Bibliography, 1946–1993

The growing concern for petroleum contamination in freshwater ecosystems led API to generate an annotated bibliography to serve as a valuable resource of existing literature on petroleum and its impact on the freshwater environment. It cites literature from 1946 through 1993 on the impact of petroleum products and oil spill cleanup agents on the biota of freshwater ecosystems, on the chemistry and fate of petroleum and cleanup agents in freshwater, and on the review of cleanup methods in freshwater systems. The electronic companion infobase has been prepared in two versions to enhance the value of the annotations: The VIP editable version of the infobase allows the user to add new references, make personal annotations (e.g. bookmarks, notes, highlights, and pop-ups), and delete unwanted references. The standard noneditable version is read-only. Both versions are completely searchable; each word in the bibliography is indexed. Pages: 224

March 1997 | available at www.api.org

Publ 4649
The Use of Chemical Countermeasures Product Data for Oil Spill Planning and Response, Volumes I and II

These proceedings address many of the issues related to potential uses of chemical countermeasure products (CCPs) in mitigating the environmental impacts of spilled oil. Volume I summarizes Workshop deliberations and presents consensus recommendations from the sessions on environmental effects, effectiveness, and decision making. Volume II contains 13 background papers for Workshop participants on various scientific and operational topics, e.g. aquatic toxicity, oil weathering, and decision-making. Pages: 380

April 1995 | Product Number: I46490 | Price: $55.00

Publ 4675
Fate and Environmental Effects of Oil Spills in Freshwater Environments

This report provides basic information necessary for the formulation of spill response strategies that are tailored to the specific chemical, physical, and ecological constraints of a given spill situation. It summarizes environmental effects from inland oil spills into fresh surface waters. It provides technical information for persons responsible for inland spill response and cleanup, for researchers, and for others dealing with protection of the environment from possible oil spill hazards. This research identifies, describes, and compares the behavior, fate, and ecological implications of crude oil and petroleum products in inland waters. Pages: 160

December 1999 | Product Number: I46750 | Price: $137.00

Publ 4684
Compilation and Review of Data on the Environmental Effects of In-situ Burning of Inland and Upland Oil Spills

Burning of spilled oil provides a relatively easy, low-cost clean-up method by reducing removal, transportation, and disposal costs as well as reducing the time required for cleanup. This study was commissioned by the American Petroleum Institute to identify those environmental conditions under which burning should be considered as a response option for oil spilled in inland

and upland habitats. This report presents a summary of the case histories and lessons learned from previous uses of burning in inland environments, with and without oil. While some information on human health and safety is included, the focus of this report is on the environmental fate and effects of *in-situ* burning. Pages: 198

March 1999 | Product Number: I46840 | Price: $113.00

Publ 4689
Chemical Human Health Hazards Associated with Oil Spill Response

API publication number 4689 contains an overview of human health hazards that could be encountered by personnel involved with spills or leaks of petroleum products. The discussion includes potential risks of basic components and products of concern. Environmental factors that may affect exposure and a brief summary of other exposure considerations are also included.

August 2001 | Product Number: I14689 | Price: $80.00

Publ 4691
Fate of Spilled Oil in Marine Waters: Where Does It Go? What Does It Do? How Do Dispersants Affect It?

This is the first of three short summary publications commissioned for preparation by the American Petroleum Institute for oil spill response decision-makers to provide concise easy-to-use information on understanding the fate of spilled oil and dispersants, their use, effectiveness, and effects. When making decisions regarding dispersant use, or any other oil spill response countermeasure, it is important to have a clear understanding of the overall fate of the oil entering the environment. With this publication you will receive a complete yet concise review of oil chemistry and oil weathering. Also provided is information on how to interpret dispersant information more effectively and how dispersants alter or affect the weathering processes of oil. Pages: 30

March 1999 | Product Number: I46910 | Price: Free*

Publ 4692
A Decision-maker's Guide to Dispersants: A Review of the Theory and Operational Requirements

This is the second of three short summary publications commissioned for preparation by the American Petroleum Institute for oil spill response decision-makers to provide concise easy-to-use information on understanding the fate of spilled oil and dispersants, their use, effectiveness, and effects. This publication provides a summary of dispersant technology. It focuses on chemical dispersant technology and the information needs of decision-makers regarding the use of chemical dispersants and their potential benefits and risks. A reference that every oil spill response decision-maker must have! Pages: 52

March 1999 | Product Number: I46920 | Price: Free*

Publ 4693
Effects of Oil and Chemically Dispersed Oil In the Environment

Crude oil is a complex, highly variable mixture of hydrocarbons and other trace compounds and exposure may cause a variety of adverse effects. Dispersants are mixtures of chemicals, solvents and surfactants used to reduce oil viscosity and help the oil break up and disperse into the water column. This booklet is intended to help bridge the gap in understanding information about exposure and effects of untreated oil and chemically dispersed oil in the marine environment.

May 2001 | Product Number: I46930 | Price: Free*

Publ 4706
Environmental Considerations for Marine Oil Spill Response

The American Petroleum Institute is offering a new revision of Environmental Considerations for Marine Oil Spill Response, generally known as the "Marine Manual." The American Petroleum Institute, the National Oceanographic and Atmospheric Administration, the U.S. Coast Guard and the U.S. Environmental Protection Agency developed the Marine Manual for oil spill contingency planners and field responders. The information allows both planners and responders to identify techniques that minimize the ecological impact of both the response action and the spilled oil. Matrix tables allow comparison of 28 different methods for response, and classify their relative environmental impacts for combinations of 5 different oil types and 25 marine habitats.

July 2001 | Product Number: I47060 | Price: $73.00

Publ 4724
Recovery of Four Oiled Wetlands Subjected to In-situ Burning

Four sites, including a diversity of oil types burned and habitats, were selected for follow-up review and evaluation of the effects of *in-situ* burning (ISB); Mosquito Bay spill in Louisiana, burned in April 2001, Lakehead Pipe Line spill in Ruffy Brook, Minnesota, burned in July 2000, Louisiana Point pipeline spill, burned in February 2000, and Chevron Pipe Line Milepost 68 near Corinne, Utah, burned twice, in March and April 2000. Site visits were conducted in July (Minnesota and Utah) and October (two sites in Louisiana). All available data on each site were collected from those involved in the burns and the post-burn monitoring. State and local monitoring data provided additional information. The site was photographed from the same position and perspective as photographs taken during and shortly after the spill and burn, creating time-series photography as a visual record of the use of *in-situ* burning and vegetative recovery. In combination with quantitative field measurements, photography provides an excellent understanding of the specific site conditions and how the results might apply to other sites. Because this report includes a large number of color photographs for the sites, which would make traditional printing of hardcopy reports very expensive, the report is being published in digital format on CD-ROM.

June 2003 | Product Number: I47240 | Price: $82.00

Publ 4735
In-situ Burning: The Fate of Burned Oil

The *in-situ* burn (ISB) is an oil spill response option that has been used far less frequently than mechanical countermeasures (booms, skimmers, etc.), and consequently, familiarity with ISB operations is limited. Decision-makers need a comprehensive understanding of the oil, how it acts in the environment and aspects of the burn process in order to understand the behavior of any ISB by-products and the potential impacts from an *in-situ* burn. This document was designed to capture that knowledge and present it clearly and concisely so you will have the necessary information to understand issues associated with fate and effects of oil to which ISB has been applied. It is not a set of instructions for carrying out a specific ISB.

April 2004 | Product Number: I46350 | Price: Free*

Publ 4740
In-situ Burning—A Decision-maker's Guide to In-situ Burning

This scenario is fictitious but the circumstances are possible. ISB is a response option that has been used less frequently than countermeasures like booms and skimmers or contaminated soil removal. Consequently, familiarity with the pros and cons of this option is limited. There are ISB "experts" in the United States and internationally, but the intentional practice of this response tool remains relatively limited for both on water and on land situations.

This booklet is the second in a series that were developed as reference documents for oil spill response decision-makers. It provides the reader with a comprehensive, concise, yet clear summary of the operational requirements and limitations for ISB, and allows decision-makers to better understand the function of *in-situ* burning and the tradeoffs facing decision-makers in smithies technology when responding to an oil spill on land or on water.

Available on www.api.org

DR 145
Identification of Oils that Produce Non-buoyant In-situ Burning Residues and Methods for Their Recovery

There is an environmental concern about the possibility of sinking residues from *in-situ* burns (ISBs), leading to the potential for damage to the aquatic

bottom zone. The objective of the study presented in this publication was to start the process of establishing operational tools and procedures for dealing with such non-buoyant burn residues. There were two tasks: develop protocols for identifying ISB residues likely to sink, and evaluate options for dealing with those residues in the field. Pages: 62

February 2002 | Product Number: IDR1450 | Price: $91.00

OIL SPILLS: MSRC REPORTS

Marine Spill Response Corporation (MSRC) Research & Development Technical Reports are available from the Linda Hall Library. To order, contact Document Services at 800-662-1545 or 816-363-4600, Fax Number: 816-926-8785, Web address: *www.lindahall.org*.

TR 91-001
Priority Topics for Research and Development in Oil Spill Response

TR 92-001
An Analysis of Historical Oil Spills and Current Cleanup Requirements to Aid in Selecting New Technologies for Spill Cleanup Operations

TR 92-002
Airborne Surveillance Technology Options for Improving Oil Spill Cleanup and Response

TR 92-003
Tenyo Maru Oil Spill (Remote Sensing Data Analysis)

TR 92-004
Oil Spill Detection Using Satellite-based SAR

TR 92-006
Incorporation of State of the Art Technologies to Oil Spill Modeling

TR 93-001
Evaluation of Marine Post-Spill Sites for Long-Term Recovery Studies

TR 93-002.1
ROPME Sea Oil Spill Nearshore Geochemical Processes Study (Vol. 1)

TR 93-002.2
ROPME Sea Oil Spill Nearshore Geochemical Processes Study (Vol. 2) (Hydrocarbon Chemistry Analytical Results for Year One)

TR 93-002.3
ROPME Sea Oil Spill Nearshore Geochemical Processes Study (Vol. 3) (Remote Sensing Derived Habitat Classification and Error Evaluation for Year One)

TR 93-003.1
Interlaboratory Calibration Testing of Dispersant Effectiveness: Phase 1

TR 93-003.2
Interlaboratory Calibration Testing of Dispersant Effectiveness: Phase 2

TR 93-004
Oil Spill Detection: Documentation of Historical Remote Sensing Projects and Status

TR 93-006
MSRC Oil Spill Response Vessel Recovered Oil Systems Tests

TR 93-007
Occupational Health Implications of Crude Oil Exposure: Literature Review and Research Needs

TR 93-009.1
Aerial Dispersant Application: Assessment of Sampling Methods and Operational Altitudes, Vol. 1

TR 93-012
MSRC Workshop Report: Research on Worker Health & Safety

TR 93-013
MSRC Workshop Report: Research on Bioremediation of Marine Oil Spills

TR 93-014
MSRC Workshop Report: Research on the Ecological Effects of Dispersants and Dispersed Oil

TR 93-018
Formation and Breaking of Water-in-Oil Emulsions: Workshop Proceedings

TR 93-019
Mesocosm Test Facility Strawman Design

TR 93-023
Seminar on Software for Oil Spill Response and Contingency Planning

TR 93-024
Summary Report MSRC/IKU Flume Design Workshop

TR 93-026
Demulsification By Use of Heat and Emulsion Breaker

TR 93-027
Transfer of Crude Oil Weathering Technology

TR 93-028
Evaluation of a Toxicity Test Method Used for Dispersant Screening in California

TR 93-029
Technical Evaluation of the Coastal Oil Spill Simulation System Prototype

TR 93-030
Determination of Oil and Emulsions Viscosity and Interfacial Tension

TR 93-031
Recovered Oil and Oily Debris Handling to Facilitate Disposal

TR 93-032
Weathering Properties and Chemical Dispersibility of Crude Oils Transported in U.S. Waters

TR 94-001
In-situ Burning of Water-in-Oil Emulsions

TR 94-003
Waterbird Deterrent Techniques

TR 94-004
A Review of the Methods and Ecological Consequences of Substrate Aeration for the Enhancement of Oil Bioremediation in Wetlands

TR 94-005
Coastal Oil Spill Simulation System Prototype Testing Program

TR 94-006
MSRC Workshop Report: Research on Waterbird Deterrents at Marine Oil Spills

TR 94-007
Phase 1: Oil Containment Boom at Sea Performance Test

TR 94-008
Rheological Correlation Studies on Water-in-Oil Emulsions

TR 94-010
Dispersed Oil and Dispersant Fate and Effects Research, California Program Results for 1993–94

TR 94-011
Toxicity Bioassays on Dispersed Oil in the North Sea: August 1994 Field Trials

TR 94-012
Demulsification by Use of Heat and Emulsion Breakers, Phase 2

TR 94-013
The Science, Technology and Effects of Controlled Burning of Oil Spills at Sea

TR 94-015
Comparison of Physically and Chemically Dispersed Crude Oil Toxicity Under Continuous and Spiked Exposure Scenarios

TR 94-018
Potential Use of the Microtox Assay as an Indicator of the Toxicity of Dispersed Oil

TR 94-019
Aerial Dispersant Application: Field Testing Research Program (Alpine, Texas)

TR 95-001
Phase 2: At Sea Towing Tests of Fire Resistant Oil Containment Booms

TR 95-002
Isolation and Identification of Compounds and Mixtures Which Promote and Stabilize Water-in-Oil Emulsions

TR 95-003
Phase 3: Oil Containment Boom at Sea Performance Tests

TR 95-004
Utility of Current Shoreline Cleaning Agent Tests in Field Testing

TR 95-005
An Analysis of Historical Opportunities for Dispersant and In-situ Burning Use in the Coastal Waters of the United States Except Alaska

TR 95-007
Field Evaluation of Bioremediation in Fine Sediments

TR 95-010
Laboratory Studies of the Properties of In-situ Burn Residues

TR 95-011
Formulation of New Fireproof Boom Designs

TR 95-012
Dispersed Oil and Dispersant Fate and Effects Research: California Program Results for 1994–1995

TR 95-014
The Effects of Oil and Chemically Dispersed Oil in Tropical Ecosystems: 10 Years of Monitoring Experimental Sites

TR 95-015
Reduction in the Toxicity of Crude Oil During Weathering on the Shore

TR 95-017
Mesoscale In-situ Burn Aeration Test

TR 95-018
Proceedings of the Third Meeting of the Chemical Response to Oil Spills: Ecological Effects Research Forum

TR 95-019
A Mental Models Approach to Preparing Summary Reports on Ecological Issues Related to Dispersant Use

TR 95-020.1
Development of Protocols for Testing Cleaning Effectiveness and Toxicity of Shoreline Cleaning Agents (SCAs) in the Field

TR 95-020.2
Test Cleaning Effectiveness and Toxicity of Shoreline Cleaning Agents (SCAs): Data Report

TR 95-021
New Brunswick Bird Deterrent Study

TR 95-022
Proceedings of the Workshop on Technical Issues Related to Mesocsm Research in the Coastal Oil Spill Simulation System Facility

TR 95-024
Oil Weathering Study of the Morris J. Berman No. 6 Cargo Oil

TR 95-025
Oil Weathering Study of Arabian Light Crude Oil

TR 95-026
Oil Weathering Study of Maya Crude Oil

TR 95-027
Weathering Characterization of Heavy Fuels

TR 95-029
Dispersant Effectiveness: Phase 3

TR 95-030
Standard Method for Viscosity Measurement of Water-in-Oil Emulsions

TR 95-031
Toxicity Assessment of Oiled and Treated Sediments from and Experimental Bioremediation Site in Delaware Bay, USA

TR 95-033
Large Scale Testing of the Effect of Demulsifier Addition to Improve Oil Recovery Efficiency

TR 95-034
Evaluation of Oil Spill Cleanup Techniques in Coastal Environments

TR 95-038
Key Factors that Control the Efficiency of Oil Spill Mechanical Recovery Methods

BIENNIAL OIL SPILL CONFERENCE PROCEEDINGS

These conferences are sponsored by the American Petroleum Institute, the Environmental Protection Agency, the U.S. Coast Guard, the International Petroleum Industry Environmental Conservation Association, and the International Maritime Organization. They address oil-spill prevention, behavior, effects, control and cleanup.

Publ 4452
1987 Oil Spill Conference Proceedings
Product Number: I44520 | Price: $55.00

Publ 4479
1989 Oil Spill Conference Proceedings
Product Number: I44790 | Price: $55.00

Publ 4529
1991 Oil Spill Conference Proceedings
Product Number: I45290 | Price: $55.00

Publ 4575
Proceedings of the 1991 Oil Spill Conference Infobase

The Proceedings of the 1991 Oil Spill Conference are available on 3.5" or 5.25" computer diskette. More than 700 pages of proceedings, including hundreds of illustrations, can be loaded onto IBM or IBM-compatible personal computers. The minimum requirements of 512K RAM, hard disk drive, VGA monitor, and DOS 3.0 or higher, are listed in the Reference Manual that gives complete instructions for operating the infobase. A tutorial and glossary are included.

January 1993 | Product Number: I45751 | Price: $57.00

Publ 4580
1993 Oil Spill Conference Proceedings

Product Number: I45800 | Price: $57.00

Publ 4620
1995 Oil Spill Conference Proceedings

Product Number: I46200 | Price: $57.00

Publ 46201
1995 Abstracts to Oil Spill Conference Proceedings

Product Number: I46201 | Price: $57.00

Publ 4621
1995 Oil Spill Conference White Papers

Three white papers—(1) "Implementing an Effective Response Management System," (2) "The Use and Misuse of Science in Natural and Resource Damage Assessment," and (3) "Perspectives on Establishing and Maintaining Oil Pollution Capabilities"—were prepared for the 1995 Oil Spills Conference to address issues of varying scientific and sociopolitical importance to the oil spill community. During the 1995 Conference, each white paper was the topic of a special panel session. Pages: 199

Product Number: I46210 | Price: $57.00

Publ 4651
1997 Oil Spill Conference Proceedings

April 1997 | Product Number: I46510 | Price: $57.00

Publ 4652
1997 Oil Spill Conference Issue Papers

Three issue papers—(1) "Putting Dispersants to Work: Overcoming Obstacles;" (2) "International Responsibilities: Are We Our Brothers' Keeper?;" and (3) "Differences in Risk Perception: How Clean is Clean?"—were prepared for the 1997 Oil Spills Conference to address issues of varying scientific and socio-political importance to the oil spill community. During the 1997 conference, each issue paper was the topic of a special panel session. Pages: 196

April 1997 | Product Number: I46520 | Price: $57.00

Publ 4675
Fate and Environmental Effects of Oil Spills in Freshwater Environments

This report provides basic information necessary for the formulation of spill response strategies that are tailored to the specific chemical, physical, and ecological constraints of a given spill situation. It summarizes environmental effects from inland oil spills into fresh surface waters. It provides technical information for persons responsible for inland spill response and cleanup, for researchers, and for others dealing with protection of the environment from possible oil spill hazards. This research identifies, describes, and compares the behavior, fate, and ecological implications of crude oil and petroleum products in inland waters. Pages: 160

December 1999 | Product Number: I46750 | Price: $137.00

Publ 4684
Compilation and Review of Data on the Environmental Effects of In-situ Burning of Inland and Upland Oil Spills

Burning of spilled oil provides a relatively easy, low-cost clean-up method by reducing removal, transportation, and disposal costs as well as reducing the time required for cleanup. This study was commissioned by the American Petroleum Institute to identify those environmental conditions under which burning should be considered as a response option for oil spilled in inland and upland habitats. This report presents a summary of the case histories and lessons learned from previous uses of burning in inland environments, with and without oil. While some information on human health and safety is included, the focus of this report is on the environmental fate and effects of *in-situ* burning. Pages: 198

March 1999 | Product Number: I46840 | Price: $113.00

Publ 4686
1999 Oil Spill Conference Proceedings

1999 | CD ROM Product Number: I4686A | Price: $57.00
Hard Copy Product Number: I4686B | Price: $57.00

Publ 4687
1999 International Oil Spill Conference Issue Papers

Two issue papers: (1) "Myths and Realities of Oil Spill Planning and Response: The Challenges of a Large Spill"—This paper reviews the myths and realities of spill preparedness and response—where improvements have occurred, which elements have been most or least effective, and where future investment should concentrate. Too many myths remain, and too few realities are understood; (2) "Judging Oil Spill Response Performance: The Challenge of Competing Perspectives"—This paper explores the roles of various participants and interested observers in a spill response and the criteria by which they judge it. Recommendations are offered to move toward a more systematic approach based on teamwork and guided by goals and performance criteria that have been accepted in advance by all stakeholders. These papers were prepared for the 1999 Oil Spills Conference to address issues of varying scientific and sociopolitical importance to the oil spill community. Pages: 106

1999 | Product Number: I4687 | Price: $57.00

Publ 4686
2001 Oil Spill Conference Proceedings

2001 | CD ROM Product Number: I4686A | Price: $57.00
Hard Copy Product Number: I4686B | Price: $57.00

Publ 4710
2003 Oil Spill Conference Proceedings

CD ROM Product Number: I4701A | Price: $299.00
Hard Copy Product Number: I4701B | Price: $299.00

Publ 4718
2005 Oil Spill Conference Proceedings

CD ROM Product Number: I47180A | Price: $299.00

SEDIMENTS

Publ 4607
User's Guide and Technical Resource Document: Evaluation of Sediment Toxicity Tests for Biomonitoring Programs

This document serves as a comprehensive guide for the selection of sediment toxicity tests. It compares the types of tests available, specific test methods, and selection of species for their strengths and weaknesses for a particular kind of habitat. Descriptions are provided on test types, test species, and sediment preparations. This publication additionally includes a User's Guide for readers unfamiliar with sediment toxicity testing. See also document Publ 4608. Pages: 236

November 1994 | Product Number: I46070 | Price: $105.00

Publ 4608
User's Guide: Evaluation of Sediment Toxicity Tests for Biomonitoring Programs

This User's Guide provides an introduction to sediment toxicity testing and presents to those unfamiliar with such testing how the resource manual (Publ 4607) can be used. The document contains descriptions of habitat type, sediment test systems, and biological endpoints. Site-specific concerns are identified to aid in test selection. Brief summaries of sampling and data analysis issues are also presented. Pages: 34

November 1994 | Product Number: I46080 | Price: $57.00

Publ 4632
Reducing Uncertainty in Laboratory Sediment Toxicity Tests

This report evaluates some of the critical components of laboratory experiments that need to be considered to obtain accurate sediment toxicity assessments. The report describes the formulation and evaluation of a reference sediment, it examines the tolerances of common testing species to sediment characteristics, it evaluates copper sulfate as a reference toxicant by determining the relative sensitivities of freshwater testing organisms, and evaluates potential sublethal endpoints for sediment potency. Pages: 152

September 1995 | Product Number: I46320 | Price: $59.00

Waste Research

Overview of Exploration and Production Waste Volumes and Waste Management Practices in the United States

This document presents the results of a survey of the industry covering 1995 that describes current volumes of wastes generated from the production of oil and gas, how those wastes are managed, and identifies changes in waste management practices over the past decade. The report includes numerous tables presenting the results from the survey.

May 2000 | This document can be downloaded from API's web site at: www.api.org/ehs/E&P_Wastes

DR 53
Characterization of Exploration and Production Associated Wastes

Approximately 0.1 percent of the total volume of exploration and production wastes generated annually by the oil and gas industry is classified as associated waste. This report presents the analytical characterization of 120 samples representing 12 different associated waste categories. Fate and transport modeling of the characterization data are also included. The modeling suggests that associated wastes do not pose a threat to groundwater when managed in accordance with API guidance on landspreading, roadspreading and burial. Pages: 160

November 1996 | Product Number: I00053 | Price: $132.00

Publ 351
Overview of Soil Permeability Test Methods

The determination of soil permeability is one of the most important items in assessing aboveground storage tank facilities' secondary containment areas. This publication outlines various methods to test the permeability of soil and distinguishes between laboratory and field methods, though it does not supply an exhaustive list of all available permeability methods. These methods are identified according to their applicability to particular soil types. The methods presented in this report are applicable to fine-grained soils (silts and clays) and coarse-grained soils (sands and gravels), but may not be appropriate to organic soils, such as peat, or to materials such as construction and demolition debris. All methods should be fully investigated for appropriateness and to determine its suitability to a particular situation. Pages: 60

April 1999 | Product Number: J35100 | Price: $87.00

Publ 4465
Evaluation of the Treatment Technologies for Listed Petroleum Refinery Wastes

The study evaluated the efficacy of five treatment methods, alone and in combination, for listed petroleum refinery wastes: mechanical treatment (filtration), solvent extraction, thermal treatment (drying), chemical fixation, and pyrolysis. The use of all the methods resulted in wastes of substantially reduced hazard, as measured by total and leachable concentration of residues in the product solid. Pages: 200

December 1987 | Product Number: I44650 | Price: $67.00

Publ 4527
Evaluation of Limiting Constituents Suggested for Land Disposal of Exploration and Production Wastes

This report describes a study to develop salinity and petroleum hydrocarbon threshold guidance values that typically should not be exceeded for one-time land application of exploration and production wastes. Definition, technical justification, and guidance for application of threshold values are provided. Measurable parameters that serve as indices for proper environmental management of salinity and petroleum hydrocarbons include: electrical conductivity (EC), sodium adsorption ratio (SAR) and exchangeable sodium percentage (ESP) for salinity, and oil and grease (OG) for petroleum hydrocarbons. Pages: 66

August 1993 | Product Number: I45270 | Price: $59.00

Publ 4733
Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbons

The purpose of this study was to develop toxicity values and screening guidelines for evaluating risks to livestock from exposure to petroleum hydrocarbons. This report addresses how to determine whether livestock should be included in a risk evaluation, and estimate risks of petroleum hydrocarbon exposures to livestock.

July 2004 | Product Number: I47330 | Price: $89.00

Publ 4734
Modeling Study of Produced Water Release Scenarios

This document provides a scientific basis for operators, regulators and landowners to determine if assessment or remediation of produced water releases will provide a meaningful environmental benefit. Pages: 124

January 2005 | Product Number: I47340 | Price: $119.00

Publ 4600
Metals Criteria for Land Management of Exploration and Production Wastes: Technical Support Document of API Recommended Guidance Values

This report provides scientifically defensible guidelines for land management of E&P wastes containing metals. It provides the technical support for recommended maximum concentrations of 12 metals. The guidance values for arsenic, cadmium, chromium, copper, lead, mercury molybdenum, nickel, selenium, and zinc were adopted directly from sewage sludge regulations promulgated by EPA in 1993. A risk-based approach was used to develop guidance values for barium and boron. The report also provides practical information on sample collection, analyses, and calculation of waste application rates. Pages: 56

January 1995 | Product Number: I46000 | Price: $57.00

Publ 4618
Characteristics and Performance of Supercritical Fluid Extraction (SFE) in the Analysis of Petroleum Hydrocarbons in Soils and Sludges

This document summarizes the results of a study to evaluate and improve supercritical fluid extraction (SFE) methods and instrumentation for analytical-scale extractions of petroleum hydrocarbons from soils and

sludges. The study determines which types of samples and waste are best suited for analysis by SFE and optimal conditions for complete extraction. Pages: 24

May 1995 | Product Number: I46180 | Price: $57.00

Publ 4663
Remediation of Salt-affected Soils at Oil and Gas Production Facilities

Water separated from oil and gas during production contains dissolved solids, including salt. If improperly handled, produced water with sufficient salt concentrations can damage plants and soils. Therefore, this manual was designed to assist the oil and gas environmental professional and field personnel to (1) assess sites with salt-affected soils; (2) evaluate remedial alternatives; and (3) conduct remedial activities, if necessary. It provides forms for organizing assessment information and conducting sample collection and analysis. Remediation options are divided into three primary groupings: natural remediation, *in-situ* chemical amendment remediation, and mechanical remediation. A decision tree and worksheets are provided to aid in the selection of a remedial option(s). Technical approaches for applying each group of remedial options are discussed. A number of appendices provide supplementary information on various aspects of salt-affected soil remediation.

October 1997 | Product Number: I46630 | Price: $106.00

Publ 4758
Strategies for Addressing Salt Impacts of Produced Water Releases to Plants, Soil, and Groundwater

The exploration and production (E&P) industry uses great care during the handling and disposal of the produced water that is generated as part of oil and gas production. However, unintentional releases can occur. Depending on the chemical composition of the produced water and the nature of the local environment, salts associated with such releases can impair soils, vegetation, and water resources.

Provides a collection of simple rules of thumb, decision charts, models, and summary information from more detailed guidance manuals to help you address the following assessment and response issues:

- Will a produced water release cause an unacceptable impact on soils, plants, and/or groundwater?
- In the event of such an impact, what response actions are appropriate and effective? Pages: 29

1st Edition | September 2006 | Product Number: I47580 | Price: $67.00

Guidelines for Commercial Exploration and Production Waste Management Facilities

Provides guidelines for the design and operations of commercial E&P waste management facilities to allow operators to identify areas where their facility could have impacts on the surrounding community and environment, and gives options for preventing/reducing those impacts. The guidelines are not meant to supersede any applicable local, state or federal requirements.

March 2001

For a free copy of this document, please go to the API web site at www.api.org and use the search function for "commercial waste facility"

Online Products

API DATA

API Data—Online Statistical Service

www.api.org/apidata

Nowadays, the oil and natural gas industry moves, quite literally, at the speed of light. Information races around the globe in the blink of an eye. Facts and figures fly back and forth, and if you're in the right place at the right time, you get the information you need.

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API Data Online is a database service that provides industry statistics to both API members and non-members. Located on the world wide web, the **API Data Online** is password-protected and available on a 12-month subscription basis.

For more information, call or visit **www.api.org/apidata**
For sales, contact Lakshmy Mahon at (202) 682-8042.
For technical inquiries, contact Crystal Harrond at (202) 682-8492

2010 Weekly Statistical Bulletin

An essential tool for producers, users, traders, and analysts of petroleum, it reports total U.S. and regional data relating to refinery operations and the production of the five major petroleum products: oxygenated, reformulated and other motor gasoline, and kerosine jet fuel, distillate (by sulphur content) and residual fuel oil. These products represent more than 80 percent of total refinery production. Inventories of these products as well as crude oil and unfinished oils are also included, along with refinery input data. In early 2004 there will be additional breakouts of gasoline blending components and distillate sulfur levels.

The Weekly Statistical Bulletin is usually published each Wednesday morning, and covers the previous week's activity. A separate Monthly Statistical Report, which is published 2 to 3 weeks following the end of the report month, analyzes and comments on the significance of trends reflected in the weekly data.

Prior years' data are available at a reduced cost. Customized reports are also available for specific weekly series at a negotiable cost, call (202) 682-8546.

Single subscriber		Member	Non-Member
T00040	Weekly Statistical Bulletin (immediate)	$10,500.00	$14,000.00
83400	PDF format (delayed 72 hours)	$1,200.00	$1,500.00

2010 Monthly Statistical Report

Contains timely interpretation and analysis of recent developments for major products, production, imports, refinery operations, and inventories–accompanied by API's estimates of these data for the most recent month and graphs of major series, including product deliveries, crude oil production, imports, refinery activity, and inventories for the past 24 months.

In addition, the December issue, published in early January, presents year-end supply/demand estimates and summarizes developments of the year.

Quarterly estimates are also included four times per year. API's Monthly Statistical Report is published 2 to 3 weeks following the end of the month.

Single subscriber		Member	Non-Member
T00002	Monthly Statistical Report	$2,000.00	$3,200.00
83404	PDF Format	$750.00	$800.00

2010 Imports and Exports of Crude Oil and Petroleum Products (12 Issues)

Published monthly by the API, the imports report contains detailed data on the imports of crude oil and petroleum products. Details include: importer of record, port of entry, country of origin, recipient, destination, quantity and API gravity (except residual fuel oil) and sulfur content (for crude oil and residual fuel oil).

The exports report is published monthly by the API and contains detailed data on crude oil and petroleum products exports. Included are port of exit, country of destination, the number of shipments, quantity, shipment value and derived prices.

Import data is based on reports filed with DOE's Energy Information Administration. The report is available by the second week of each month. Historical data are also available in electronic format.

The exports report is based on data collected by the Department of Commerce/Bureau of the Census and is available each month.

Single subscriber		Member	Non-Member
T00050	Imports/Exports	$7,200.00	$12,000.00
30000	Hard Copy	$3,100.00	$3,800.00

2010 Inventories of Natural Gas Liquids and Liquefied Refinery Gases

This report presents data on the inventory levels of ethane, propane, isobutane, normal butane, and pentanes plus. These inventories, located at natural gas plants, refineries, bulk terminals and in underground storage, are grouped into eight regional areas. The report is issued each month and it covers the previous month.

Single subscriber		Member	Non-Member
T00004	Inventories of Natural Gas & Liquefied Refinery Gases	$3,800.00	$4,000.00
42400	PDF	$3,800.00	$4,000.00

2010 Quarterly Well Completion Report

Provides detailed information on reported drilling activity, as well as estimates of the total number of wells and footage drilled for the current and recent quarters. The estimates of quarterly completions and footage are disaggregated by well type, depth interval, and quarter for the current year and 2 prior years.

The data on reported drilling by date of completion includes well and footage data by quarter on a state and/or area basis. The reported drilling activity is also presented by depth interval. These tables show the cumulative number of well completions for the current year and 2 prior years.

Separate tables are also provided by year for total wells, exploratory and development wells and new-field wildcat completions on a state and/or area basis. Reported completions by depth interval are given on an annual basis for the total United States, for exploratory wells, total U.S. onshore, and total U.S. offshore.

The report is available within two weeks following the end of a quarter.

Single subscriber		Member	Non-Member
T00006	Quarterly Well Completion Report	$2,400.00	$3,000.00
90171	PDF (4 issues)	$2,300.00	$2,800.00

Call (202) 682-8508 for more information

2009 Sales of Natural Gas Liquids and Liquefied Refinery Gases

Presents the results of the annual survey jointly sponsored by the American Petroleum Institute (API), Gas Processors Association (GPA) Antion Propane Gas Association (NPGA) and Propane Education & Research Council (PERC). This publication reports estimated sales of Natural Gas Liquids and Liquefied Refinery Gases and *not* consumption.

Single subscriber

N62817	2009 Sales of Natural Gas Liquids & Liquefied Refinery Gases	$300.00
N62817	PDF	$300.00

Call (202) 682-8499 for more information

2009 Joint Association Survey on Drilling Costs

This annual report is the only long-term source of information on detailed U.S. drilling expenditures. The survey, conducted since 1959, presents information on wells, footage and related expenditures for each active drilling area. Data for oil wells, gas wells, and dry holes are reported separately and the information is further disaggregated by depth interval for each state and area. Similar summary tables are provided for the offshore and onshore areas. Also included in the report are sections on drilling expenditures for exploratory and development wells, horizontal wells and coal-bed methane gas wells. A comparison of the impact of price change on the drilling costs is also included.

Note: Repackaged to include only summary cost data.

Single subscriber

T00007	2009 Joint Association Survey	$3,000.00
N90055	Hard Copy or PDF	$3,000.00

Call (202) 682-8499 for more information

2010 Basic Petroleum Data Book (2 issues)

Provides valuable domestic and world statistical background information, beginning in most instances with 1947. Included are data on energy, reserves, exploration and drilling, production, finance, prices, demand, refining, imports, exports, offshore transportation, natural gas, Organization of Petroleum Exporting Countries, and environmental.

The printed Data Book is updated and published twice a year. Each report is issued in a self-contained, bound volume, and is no longer needed once the next issue is published.

Both the electronic and printed versions also include a glossary of definitions and a source list (names, telephone numbers) for references in the Data Book.

Single subscriber		Member	Non-Member
T00008	Basic Petroleum Data Book	$3,000.00	$5,700.00
05400	Hard Copy (2 issues only)	$1,250.00	$1,600.00

12-month Expanded Electronic Subscription with constant updates and revisions, Available only through API Data Online

Petroleum Industry Environmental Performance
Sixth Annual Report

Contains information on a total of eight environmental indicators: chemical releases; refinery residuals; oil spills in U.S. waters; used motor oil collection; workplace safety; environmental expenditures by U.S. petroleum industry; and, underground storage tanks upgrades and gasoline vapor controls. Most of the statistics are current through 1996. Historical information is included where possible. This report is intended to be used as a yardstick to assess the industry's performance and measure its progress.

Price: Free for printed copy*

Petroleum Industry Environmental Performance
Fifth Annual Report

Contains information on a total of eight environmental indicators: chemical releases, refinery residuals, oil spills in U.S. waters, used motor oil collection, workplace safety, environmental expenditures by U.S. petroleum industry; and, underground storage tanks upgrades and gasoline vapor controls. Most of the statistics are current through 1995. Historical information is included where possible. This report is intended to be used as a yardstick to assess the industry's performance and measure its progress. Pages: 54

Price: Free for printed copy*

Petroleum Industry Environmental Performance
Fourth Annual Report

Same as the Fifth Annual Report except that most of the statistics are current through 1994.

Price: Free for printed copy*

Petroleum Industry Environmental Performance
Third Annual Report

Same as the Fourth Annual Report except that most of the statistics are current through 1993.

Price: Free for printed copy*

Petroleum Industry Environmental Performance
Second Annual Report

Contains information on the petroleum industry's chemical releases, refinery residuals, oil spills in U.S. waters, used oil collection centers, job-related injuries and illnesses, and environmental expenditures for up to 1992. Where possible, historical data are provided.

Price: Free for printed copy*

Standard Definitions of Petroleum Statistics

Contains key definitions of terms used in API surveys and reports such as the Weekly Statistical Bulletin—including definitions for new products such as high and low sulfur distillate fuel and RFG. A new section containing environmental terms has also been added to this report.

These definitions were designed to provide a consistent basis for the reporting and interpretation of petroleum industry statistics. They are not intended to meet definitional requirements for disciplines such as taxation, engineering and law.

5th Edition | 1995

Price: $65.00 | Member Price: $52.00

Electronic Copy Only:
Available free through API Data Online with online subscription

API State Information Network

The API State Information Network is an on-line database of state legislative and regulatory information presented from a petroleum industry perspective. Located on the world wide web, the API State Information Network is password-protected and available on an annual subscription basis.

For more information call (202) 682-8212 or e-mail fowler@api.org.

SECURITY

API Standard for Third Party Network Connectivity

Provides guidance for implementing secure third-party connections between the information technology systems and network of two companies that have a business relations and a common objective.

The standard will provide suggestions for companies to establish third-party network connections while protecting their individual systems and data from unauthorized access or manipulation. Pages: 36

October 2007 | Product Number: TSTP01 | Price: $87.00

Security Guidance for the Petroleum Industry

API's 2nd Edition of *Security Guidance for the Petroleum Industry*, is now in use at oil and gas facilities around the world to help managers decide how to deter terrorist attacks. Covering all segments of the industry (production, refining, transportation, pipeline, and marketing), this guidance builds on the existing solid foundation of design and operational regulations, standards, and recommended practices, which relate to facility design and safety, environmental protection, emergency response, and protection from theft and vandalism. Produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies, these guidelines, viewed as a living document, are broadly applicable to facility security in light of September 11, 2001, and provide the starting point for developing security plans at oil and natural gas facilities and operations. Pages: 169

2nd Edition | March 2003 | Product Number: OS0001 | Price: $185.00

Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

The American Petroleum Institute and the National Petrochemical & Refiners Association jointly developed a new methodology for evaluating the likelihood and consequences of terrorist attacks against refineries and petrochemical facilities. *Security Vulnerability Assessment Methodology for Petroleum and Petrochemical Facilities* is designed for companies to use in assessing vulnerabilities and potential damages from different kinds of terrorist attacks. In the post September 11 era, companies have reevaluated and enhanced security at their facilities. The methodology will provide officials with a new analytical tool to determine "the likelihood of an adversary successfully exploiting vulnerability and the resulting degree of damage or impact." This vulnerability assessment methodology was produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies. Pages: 155

October 2004 | Product Number: OSVA02 | Price: $185.00

SOFTWARE

API Risk-Based Inspection Software

API RBI software, created by petroleum refinery and chemical plant owner/users for owner/users, finds its basis in API Publication 581, Base Resource Document—Risk-Based Inspection. Practical, valuable features are built into the technology, which is based on recognized and generally accepted good engineering practices.

The purposes of the Risk-Based Inspection Program are:

- Screen operating units within a plant to identify areas of high risk.
- Estimate a risk value associated with the operation of each equipment item in a refinery or chemical process plant based on a consistent methodology.
- Prioritize the equipment based on the measured risk.
- Design a highly effective inspection program.
- Systematically manage the risks associated with equipment failures.

The RBI method defines the risk of operating equipment as the combination of two separate terms: the consequence of failure and the likelihood of failure.

For more information: e-mail rbi@api.org or call 281-537-8848

Publ 4575
Proceedings of the 1991 Oil Spill Conference Infobase

The Proceedings of the 1991 Oil Spill Conference are available on 3.5" or 5.25" computer diskette. More than 700 pages of proceedings, including hundreds of illustrations, can be loaded onto IBM or IBM-compatible personal computers. The minimum requirements of 512K RAM, hard disk drive, VGA monitor, and DOS 3.0 or higher, are listed in the Reference Manual that gives complete instructions for operating the infobase. A tutorial and glossary are included.

January 1993 | Product Number: I45751 | Price: $57.00

Publ 4636
HGSYSTEM 3.0: Technical Reference Manual and User's Guide

The Technical Reference Manual is intended as a source of background information for users who want to know more about the technical/scientific contents of the HGSYSTEM modules used to model atmospheric dispersion of neutrally buoyant and heavier-than-air gases. The modules calculate release terms, evaporating liquid pools, jet dispersion, and heavy gas dispersion. The User's Guide contains all the information necessary to run HGSYSTEM and interpret results. The IBM-compatible software provided includes the source and executable codes of HGSYSTEM 3.0. Users require a minimum of a 386 processor, DOS 3.3, 4 MB RAM and 2.5 MB disk space. (Two binders are included.) Pages: 281

November 1995 | Product Number: I46360 | Price: $264.00

Publ 4640
Petroleum in the Freshwater Environment: An Annotated Bibliography, 1946–1993

The growing concern for petroleum contamination in freshwater ecosystems led API to generate an annotated bibliography to serve as a valuable resource of existing literature on petroleum and its impact on the freshwater environment. It cites literature from 1946 through 1993 on the impact of petroleum products and oil spill cleanup agents on the biota of freshwater ecosystems, on the chemistry and fate of petroleum and cleanup agents in freshwater, and on the review of cleanup methods in freshwater systems. The electronic companion infobase has been prepared in two versions to enhance the value of the annotations: The VIP editable version of the infobase allows the user to add new references, make personal annotations (e.g. bookmarks, notes, highlights, and pop-ups), and delete unwanted references. The standard noneditable version is read-only. Both versions are completely searchable; each word in the bibliography is indexed. Pages: 224

March 1997

(noneditable) Product Number: I46400 | Price: $58.00
(VIP editable) Product Number: I46401 | Price: $72.00

Publ 4661
Exploration and Production Emission Calculator II (EPEC II) User's Guide

The Exploration and Production Emission Calculator Version 2.0 (EPEC II) is a software tool that can be used to estimate emissions for exploration and production (E&P) facilities. EPEC II integrates user inputs, emission calculations, and data summaries for many equipment types common to E&P facilities. The calculation techniques and emission factors utilized by the EPEC II software were, in most cases, established by the U.S. Environmental Protection Agency (EPA), the American Petroleum Institute (API), and the Gas Research Institute (GRI). Published references that provide background information for the calculation methods used in EPEC II are given for each equipment type in both the software and in each section of this User's Guide. Pages: 96

2nd Edition | January 2007 | Product Number: I466102 | Price: $115.00

Publ 4680
Amine Unit Air Emissions Model Evaluation

The implementation of the 1990 Clean Air Act Amendments (CAAA) in the United States has created the need for a reliable method to estimate and report hydrocarbon emissions from amine units. A simulation package, called Amine Unit Air Emission Model (AMINECalc) Version 1.0 was developed. This report evaluates the AMINECalc model by comparing the simulation results with field data collected from operating gas plants. It also recommends improvements and modifications to refine the predictions. See also Publ 4679. Pages: 96

December 1998 | Product Number: I4680 | Price: $113.00

Publ 4697
Production Tank Emissions Model (E&P TANK, Version 2.0)

E&P TANK, developed in conjunction with the Gas Research Institute, is a personal computer model designed to use site-specific information in a user-friendly format to predict emissions from petroleum production storage

tanks. The model calculates flashing losses and simulates working and standing losses, using data provided by the user. Calculations distinguish between HAPs and VOCs, showing detailed speciated emission rates from methane to decanes. System requirements are an IBM PC 386 compatible or higher, at least 2 MB RAM, a math coprocessor, and WINDOWS® 3.1 or later. Pages: 86

April 2000 | Product Number: I46970 | Price: $532.00
Member Price: $266.00

ELECTRONIC BUSINESS STANDARDS (EDI AND XML)

Publ 3800
AVNET—Electronic Document Formats for Aviation Fuel Sales

The AVNET Implementation Guideline includes instructions for implementing electronic formats for aviation fuel invoices, delivery tickets, price notifications, and electronic payment/remittance advice transactions sets. Conventions for the use of these documents encompass both the American National Standards Institute (ANSI) ASC X12 EDI format and the United Nations EDIFACT (UN/EDIFACT) standard.

Hard Copy Product Number: 038002 | Price: $452.00
Electronic (PDF) Product Number: 03800D | Price: $452.00

Publ 3802
Audit Control Guide

This publication is a comprehensive examination of the audit and control issues that should be taken into consideration when implementing Electronic Data Interchange (EDI). The guide is intended to be used as a reference document in the preparation of more definitive guidelines, programs and procedures for specific users and business risks.

Product Number: 038020 | Price: $144.00

Publ 3805
CDEX—Checkstub Data Exchange Implementation Guidelines

The CDEX Implementation Guideline provides information on the field formats and record layouts to facilitate the transmission and processing of crude oil and natural gas lease revenue checkstub detail.

Product Number: 038050 | Price: $140.00

Publ 3810
CODE—Crude Oil Data Exchange Implementation Guidelines

The CODE Implementation Guidelines provide information on the field formats and record layouts to facilitate the transmission and processing of crude oil run tickets, oil run statements and tank increments regarding purchases between producers and transporters.

Product Number: 038100 | Price: $140.00

Publ 3815
COS—Crude Oil Settlements Implementation Guidelines

The COS Implementation Guidelines provides instructions for facilitating the exchange of crude oil settlement invoices, account balance statements, and electronic payments/remittance advice transactions sets. The guideline includes industry conventions for the use of the American National Standards Institute (ANSI) ASC X12 Invoice (810), Payment Order/ Remittance Advice (820), and Inventory Inquiry/Advice (846) Transaction Sets.

Product Number: 038150 | Price: $270.00

Publ 3820
GRADE—Gas Revenue Accounting Data Exchange Implementation Guideline (Proprietary Format)

The GRADE Implementation Guideline facilitates the transmission and processing of natural gas liquids and natural gas metered and allocated volumes, test data and plant/lease settlement data using a proprietary data format.

PProduct Number: 038200 | Price: $140.00

Publ 3821
GRADE—Gas Revenue Accounting Data Exchange Implementation Guideline (ANSI ASC X12 Format)

The GRADE Implementation Guide facilitates the transmission and processing of natural gas liquids and natural gas metered and allocated volumes, test data and plant/lease settlement data using the American National Standards Institute (ANSI) ASC X12 Report of Test Results (863) Transaction Set based on version/release 3060.

Product Number: 038210 | Price: $270.00

Publ 3822
JIBE—Joint Interest Billing Exchange Implementation Guideline

The JIBE Implementation Guideline provides information for the use of Electronic Data Interchange (EDI) for the exchange of joint interest billing data and invoice detail between trading partners. The guide gives the mapping specifications for the Joint Interest Billing (819) Transaction Set based on ASC X12 Version/Release 4140.

Product Number: 038220 | Price: $270.00

Publ 3830
PIPENET—Pipeline Operations Information

The PIPENET Implementation Guideline provides information for the use of electronic data interchange for the exchange of pipeline operations data between trading partners. It contains industry conventions for sending nominations, confirmations, meter and gauge tickets, inventory statements as well as pipeline invoices. This guide utilizes the Invoice (810), Inventory Inquiry/Advice (846), Receiving Advice (861), and Planning Schedule with Release Capability (830) transaction sets based on ASC X12 Version/ Release 4010.

2nd Edition | Product Number: 038300 | Price: $452.00

Publ 3835-3
Purchasing and Materials Management Implementation Guideline

The Purchasing and Material Management Implementation Guideline contains conventions for purchasing documents including purchase orders, invoices, and acknowledgments. This publication includes industry conventions on the American National Standards Institute (ANSI) ASC X12 Invoice (810), Price/Sales Catalog (832), and Purchasing Suite (850/855/ 860/865) of transactions sets based on version/release 3030. The guideline also contains industry conventions for the ANSI ASC X12 Payment Order/Remittance Advice (820) Transaction Set based on version/release 3040 as well as the Request for Quotation (840) and Response to Request for Quotation (843) based on version/release 2040. In addition, conventions for the Ship Notice/Manifest (856), Order Status Inquiry (869), and Order Status Report (870) transaction sets based on version/release 3010 are included as well.

4th Edition | Hard Copy Product Number: 038353 | Price: $452.00
PDF File Product Number: 03835D | Price: $452.00

Publ 3855
WITS—Wellsite Information Transfer System Implementation Guideline

The WITS Implementation Guideline provides instructions and the format for transmitting real-time drilling parameters and information to joint interest partners.

Product Number: 038550 | Price: $270.00

Publ 3860
WODEX—Well-operating Data Exchange Implementation Guideline

The WODEX Implementation Guideline provides instructions to use Electronic Data Interchange (EDI) for the transfer of well-operating data between operators, working interest owners and regulatory agencies, using the American National Standards Institute (ANSI) ASC X12 Product Transfer and Resale Report (867) based on version/release 3030.

Product Number: 038600 | Price: $270.00

Publ 3865
PIDD—Petroleum Industry Data Dictionary

The diskette contains a working repository developed by PIDX of standardized business terms and definitions used to facilitate Electronic Data Interchange (EDI) across the petroleum industry.

Product Number: 038650 | Price: $140.00

Publ 3875
Progress of Electronic Commerce Implementation in the Petroleum Industry—1999

This latest in a series of surveys was designed and conducted to aid the process of collecting data to cost justify and support the benefits of PIDX and EDI. The inaugural survey was conducted in the Fall of 2000 and requested 1999 data.

Product Number: 038754 | Price: $341.00

Publ 3875
Progress of Electronic Commerce Implementation in the Petroleum Industry—1998

This is the third in a series of surveys which was designed and conducted to aid the process of collecting data to cost-justify and support the benefits of PIDX and EDI. This inaugural survey was conducted in the summer of 1998 and requested 1997 data.

Product Number: 038753 | Price: $200.00

Publ 3875
Progress of Electronic Commerce Implementation in the Petroleum Industry—1997

This is the second in a series of surveys which were designed and conducted to aid the process of collecting data to cost-justify and support the benefits of PIDX and EDI. The goals of the data collection efforts were to: measure the progress of EDI implementation within the industry and to identify areas for improvement; quantify the benefits to the industry of implementing EDI; determine industry averages for use as benchmarks; and analyze trends. This inaugural survey was conducted in the summer of 1997 and requested 1996 data.

Product Number: 038752 | Price: $200.00

Publ 3875
Progress of Electronic Commerce Implementation in the Petroleum Industry—1996

This is the first in a series of surveys which were designed and conducted to begin the process of collecting data to cost-justify and support the benefits of PIDX and EDI. The goals of the data collection efforts were to: measure the progress of EDI implementation within the industry and to identify areas for improvement; quantify the benefits to the industry of implementing EDI; determine industry averages for use as benchmarks; and analyze trends. This inaugural survey was conducted in the summer of 1996 and requested 1995 data.

Product Number: 038750 | Price: $200.00

RP 3901
PIDX XML Transaction Standards, Version 1.0

12 transaction XML schemas for Quote Request, Quote, Quote Notification, Return Requisition Request, Order, Order Response, Order Change, Field Ticket, Field Ticket Response, Invoice, Invoice Response, and Invoice Exception.

Standards for elements for transaction forms for Cementing Services, Coiled Tubing Services, Completion Services, Logging Services for cased and open holes, Perforating Services, Stimulation services, oilfield transportation services, well drilling and bit services, and well testing services.

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DISCUSSION PAPERS

DP 088
Restoring Natural Resources: Legal Background and Economic Analysis

This paper reviews the legislative and legal history behind the resource damage restoration regulations under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Oil Pollution Act (OPA). The damage restoration debate is whether the objective is to restore a natural resource's lost services or whether to restore the exact chemical, biological and physical characteristics. This paper reviews the debate over these approaches to restoration and the economic implications of adopting one approach over another. This paper supports a services approach and suggests modifications to the current interpretation of restoration requirements. Pages: 32

October 1997

DP 086
Opposition to OCS Development, Historical Context and Economic Considerations

This paper reviews the history of offshore leasing, focusing on the long conflict between the federal government and the states over control of the leasing process. The paper then examines economic aspects of leasing and relates these to the controversy surrounding leasing. The conclusions of the analysis suggest that consideration should be given to sharing a portion of federal offshore revenues with affected coastal communities. This sharing has the potential to reduce opposition to offshore leasing and allow the nation to realize more of the net benefits from tapping offshore oil and natural gas resources.

November 1996

DP 084R
Analysis of the Costs and Benefits of Regulations: Review of Historical Experience

Recent legislative proposals to reform the regulatory process have included the use of benefit cost analysis to decide whether or not a regulation should be implemented. The purpose of this paper is to assess the current practices of benefit cost analysis, primarily through examination of the series of Regulatory Impact Analyses (RIAs) mandated by Presidential Executive Orders. While the record is mixed, it shows that in many, but perhaps not all, cases it is possible to develop a reasonable estimate of the benefits and costs of proposed regulations and to decide among regulatory alternatives on the basis of these analyses.

December 1996

DP 081
Are We Running Out of Oil?

Since the dawn of the petroleum industry in the mid-19th century, there have been recurrent waves of concern that exhaustion of the world's petroleum resource base was imminent. This study examines carefully both the historical record and the most prominent recent geological assessments. The analysis shows that the obvious concern—that of imminent exhaustion of world oil resources—is actually the most easily dismissed. Nature continues to be quite generous in providing oil resources for development. However, there is a danger that attempts by government to address the nonproblem of resource exhaustion will distract from or even aggravate the challenge of removing institutional barriers to supply development.

December 1995

DP 080
Efficiency and Equity Effects of Value-added and Other Broad-based Consumption Taxes: A Review of the Literature

This study reviews the economic literature on the likely efficiency and equity effects of adopting a value-added or other broad-based consumption taxes, relative to the existing income tax system. The paper also provides comparisons with various energy taxes. The paper finds that broad-based consumption taxes can improve the efficiency of the tax system and will increase incentives for savings, investment and economic growth. Such taxes may raise equity concerns that can be addressed in several ways. Given the likelihood of debate about tax increases and tax reform in the future, the paper will serve as a resource document to the likely economic impacts of both broad- and narrow-based consumption taxes.

July 1995

DP 077
Alternative Wetland Mitigation Programs

The Corps of Engineers and EPA have issued Memoranda of Agreement and guidance that restrict the petroleum industry's ability to explore for and produce oil and natural gas in wetlands. In particular, federal agency rules require wetland mitigation banks—that could be used to compensate for possible wetland losses—to be fully functional before industry can use them. However, state and local governments often allow for concurrent and in lieu fee banking arrangements; these allow for payments to a group or agency that will undertake wetland restoration or preservation in lieu of managing such activities directly. This study examines those programs, their relationship to the federal permitting process, how they assure mitigation is successful, and how they achieve no overall net loss of wetlands.

February 1995

DP 076
Federal Subsidies for Alternative Fuels and Alternative-Fuel Vehicles

Identifies and attempts to evaluate the economic value of the many federal programs that subsidize alternative fuels such as ethanol, methanol, compressed natural gas, liquefied natural gas, propane, and electric cars. The subsidies take many forms: research and development; preferential tax treatment; direct government purchases; exemptions from environmental requirements; and quality mandates; and can be directed at the fuel itself or at vehicles that use the fuel or the fuel distribution infrastructure.

September 1994

DP 074
Current Status of Watershed Management in the United States

To understand the current status of watershed programs, this paper reviews watershed approaches of individual watershed programs and institutions. Each case study also discusses, in a general manner, the impact on petroleum industry activity within the watershed. Background information is also provided on the CWA, the nonpoint source pollution problem in the United States, and the current emphasis on watershed management approaches. For additional information on the following studies, please contact the Policy Analysis and Strategic Planning department directly at 202-682-8543.

November 1993

RESEARCH STUDIES

RS 094
How Unilateral Economic Sanctions Affect the U.S. Economy: An Inter-Industry Analysis

The National Association of Manufacturers (1997) estimates that a total of 61 U.S. laws and executive actions targeting 35 countries and billions of dollars of goods and services have been unilaterally enacted over the 1993–1996 period. Hufbauer et al. (1997) have estimated that U.S. unilateral

sanctions in force in 1995 reduced exports by $15 billion to $19 billion in that year, putting at risk 200,000 to 250,000 high-wage export supported jobs. This report provides sector and industry specific breakdowns of such aggregate impacts. Also, the initial impact in a given industry is traced to supporting industries, e.g., to input suppliers, and transport and marketing industries. Thus, while the direct burden of sanctions may fall on a narrow set of industries, the analysis reveals the extent to which the impacts spill over into other sectors of the economy, an area to date that has not received adequate attention. It follows that foregone exports are too narrow a measure of the costs of unilateral economic sanctions. The report also notes that capital goods, energy, chemicals, and agricultural products have been disproportionately impacted by U.S. unilateral sanctions.

November 1998

RS 082
Superfund Liability and Taxes: Petroleum Industry Shares in Their Historical Context

Summarizes historic and current information about petroleum industry superfund cleanup liability and taxes. It estimates the amount of Superfund taxes paid from 1982 through the early 1990s and then calculates the petroleum industry's share of Superfund taxes. This paper documents the large disparity that exists between the share of superfund taxes paid by the petroleum industry and the share of contamination that can be attributed to the petroleum industry; the results show that the petroleum industry's share of general superfund taxes far exceeds its share of cleanup costs.

July 1996

RS 076
Paying for Automobile Insurance at the Pump: A Critical Review

Proponents of pay-at-the-pump (PAP) auto insurance advocate replacing the current system of driver-purchased motor vehicle insurance with a new one where a major portion of the cost of insurance would be paid for by new taxes at the gasoline pump. Some groups and states have given some consideration to a form of PAP insurance. This paper examines efficiency and equity effects of such proposals. It finds the PAP proposals are (a) based on false assumptions of accident causes; (b) not needed to solve the uninsured motorist problem; (c) incorrectly link promises of large savings to paying for insurance at the pump; and, (d) both inequitable and inefficient.

December 1994

RS 075
Improving Cost-Effectiveness Estimation: A Reassessment of Control Options to Reduce Ozone Precursor Emissions

Regulators and industry use cost-effectiveness techniques as a decision tool to rank the desirability of emission control strategies. This paper examines the conceptual basis for cost-effectiveness estimates for the control of stationary mobile source emissions focusing on volatile organic compounds that are precursors of ozone. The paper also provides an independent set of cost-effectiveness estimates for enhanced inspection/maintenance programs, vehicle scrappage, the low emission vehicle standard and reformulated gasoline.

August 1994

RS 074
Air Emissions Banking and Trading: Analysis and Implications for Wetland Mitigation Banking

Examines the history of the air emissions banking and trading policy initiated by EPA in the early 1970s, and identifies the factors that hindered its success. The lessons learned from the air emissions program are applied to wetland mitigation banking. It is hoped that wetlands banking and trading mechanisms will increase the ability to proceed with economic activity and still preserve wetlands. Potential solutions for avoiding the problems encountered in the air emissions trading program are also discussed.

February 1994

RS 073
Electric Vehicles, Their Technical and Economic Status

Air quality concerns, particularly in urban areas not meeting the ozone air quality standard, have led legislators and regulators to seek new measures to reduce vehicle emissions. Replacing traditional gasoline-powered internal combustion engine vehicles with electric vehicles is one measure being considered, and in some cases mandated, by various governments. This paper presents the current technical and economic status of electric vehicles, including the potential market, life-cycle costs, emissions, and other possible benefits compared to internal combustion engine vehicles.

January 1994

RS 067
The Cost Effectiveness of Vehicle Inspection and Maintenance Programs

Several states began automobile inspection and maintenance (I/M) programs during the 1970s as part of their effort to reduce carbon monoxide and ozone precursor emissions. The Clean Air Act Amendments of 1990 further increased the scope of I/M programs. This paper offers an evaluation of inspection and maintenance from the perspective of cost-effectiveness: program costs divided by program effectiveness. Effectiveness is measured in tons of pollutants removed: volatile organic compounds (VOC), carbon monoxide (CO) and nitrogen oxides (NO_x). Where possible, individual program components are evaluated with respect to cost-effectiveness that should be included in assessments of I/M: a formal decision tree model of the I/M process; cost-effectiveness estimates of current and enhanced I/M programs; and, alternatives for making I/M more cost effective.

December 1993

RS 064
U.S. Petroleum Supply: History, Prospects, and Policy Implications

September 1992

RS 056
Economics of Alternative Fuel Use: Compressed Natural Gas as a Vehicle Fuel

December 1990

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August 1990

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July 1990

RS 051
The Use of Economic Incentive Mechanisms in Environmental Management

June 1990

RS 032
An Empirical Analysis of the Determinants of Petroleum Drilling

December 1983

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OTHER PUBLICATIONS

The Economics of Energy Security

Prepared by Douglas R. Bohi and Michael A. Toman Thisan. This book examines energy security as a basis for designing energy policy. Energy security refers to the loss of economic welfare that may occur as a result of change in price or availability of energy. (ISBN 0-7923-9664-2)

January 1996

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http://billybproductions.com/main/albums/energy-and-me

Classroom Energy! CD

API has created an online resource for teachers and students that explores the topic of energy at www.classroom-energy.org including classroom activities, interactive tours, and links to a variety of energy education materials.

www.classroom-energy.org/contact_us.html

There's a Lot of Life in Oil and Natural Gas

Describes the importance of oil and natural gas in our daily lives. Lists the fuels, products, and other essential items vital to maintaining our quality of life.

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VIDEO

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A 17-minute (available in VHS and DVD formats) educational and entertaining video for teen students that illustrates with pop music and dance the often invisible role petroleum products play in our lives. It shows how oil is transformed into products such as gasoline, jet fuel, cosmetics, clothing, CDs and even aspirin. The video, designed for a middle-school audience, was produced by Emmy award-winning journalist Ellen Kingsley with a cast including a real science teacher and several teens.

September 1996 / Price: No charge for single copies.
To Order, contact API Communications Department: (202) 682-8062

CHINESE

API 510 ◆
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The Chinese translation of API 510.

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Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Chinese

The Chinese translation of Recommended Practice 571.

1st Edition | December 2003 | Product Number: C57101C | Price: $238.00

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Inspection of Atmospheric & Low Pressure Storage Tanks—Chinese

The Chinese translation of Recommended Practice 575.

2nd Edition | April 2005 | Product Number: C57502C | Price: $132.00

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The Chinese translation of Recommended Practice 577.

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The Chinese translation of Recommended Practice 578.

1st Edition | May 1999 | Product Number: C57801C | Price: $124.00

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The Chinese translation of Standard 650.

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The Chinese translation of Recommended Practice 651.

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The Chinese translation of Recommended Practice 652.

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The Chinese translation of Standard 653.

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GERMAN *

RP 571
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry —German

The German translation of Recommended Practice 571.

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RUSSIAN *

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Specification for Fire Test for Check Valves-Russian

The Russian translation of Specification 6FD.

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The Russian translation of Recommended Practice 11S2.

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RP 11S3
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The Russian translation of Recommended Practice 11S3.

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Design, Installation, Repair and Operation of Subsurface Safety Valve Systems—Russian

Russian translation of Recommended Practice 14B.

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RP 14H
Recommended Practice for Installation, Maintenance and Repair of Surface Safety Valves and Underwater Safety Valves Offshore—Russian

Russian translation of Recommended Practice 14H.

5th Edition | August 2007 | Product Number: G14H05R | Price: $121.00

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RUSSIAN (CONTINUED)*

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Check Valves: Flanged, Lug, Wafer and Butt-welding—Russian
Russian translation of Standard 594.
6th Edition | September 2004 | Product Number: C59406R | Price: $93.00

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Russian translation of Standard 603.
7th Edition | June 2007 | Product Number: C60307R | Price: $76.00

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Reconditioning of Metallic Gate, Globe, and Check Valves-Russian
The Russian translation of Recommended Practice 621.
2nd Edition | December 2005 | Product Number: C62102R | Price: $129.00

SPANISH

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The Spanish translation of Chapter 1. Pages: 82
2nd Edition | July 1994 | Product Number: H010SP | Price: $111.00

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The Spanish translation of Chapter 3.1A.
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Guidelines for Determining Fullness of Pipelines Between Vessels and Shore Tanks—Spanish
The Spanish translation of Chapter 17.6.
1st Edition | August 1994 | Product Number: H17061SP | Price: $98.00

Chapter 17.8
Guidelines for Pre-Loading Inspection of Marine Vessel Cargo Tanks—Spanish
The Spanish translation of Chapter 17.8.
1st Edition | August 1998 | Product Number: H1707SP | Price: $98.00

Chapter 17.9
Vessel Experience Factor (VEF)—Spanish
The Spanish translation of Chapter 17.9.
1st Edition | October 2005 | Product Number: H17091SP | Price: $148.00

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MPMS CHAPTER 11.1—1980

Chapter 11.1—1980 has not been withdrawn, but superseded. The 1980 Standards should not be utilized on new applications. Chapter 11.1—2004 (page 41 of this Catalog) is to be utilized on all new applications.

Chapter 11.1
Volume Correction Factors—Volume I

Table 5A—Generalized Crude Oils and JP-4, Correction of Observed API Gravity to API Gravity at 60°F.
Table 6A—Generalized Crude Oils and JP-4, Correction of Volume to 60°F Against API Gravity at 60°F.
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Chapter 11.1
Volume Correction Factors—Volume II

Table 5B—Generalized Products, Correction of Observed API Gravity to API Gravity at 60°F.
Table 6B—Generalized Products, Correction of Volume to 60°F Against API Gravity at 60°F.
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Chapter 11.1
Volume Correction Factors—Volume III

Table 6C—Volume Correction Factors for Individual and Special Applications, Volume Correction to 60°F Against Thermal Expansion Coefficients at 60°F.
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Chapter 11.1
Volume Correction Factors—Addendum to Volume III/IX Volume Correction—MTBE

Provides users of the API *Manual of Petroleum Measurement Standards* Chapter 11.1, Volume III (Table 6C) and Volume IX (Table 54C) with revised volume correction factor tables for MTBE. The tables can be used to expedite calculation of the volume of mixtures composed predominantly of MTBE at standard conditions from volumes at other conditions. These tables apply to commercially available mixtures containing at least 85 weight percent MTBE. The information gained from using these tables can be used to determine quantities of MTBE in tanks, shipping containers, and other storage containers typically used in the petroleum industry. Table 6C—Volume Correction Factors for Individual and Special Applications, Volume Correction for MTBE to 60°F and Volume IX, Table 54C—Volume Correction for Individual and Special Applications, Volume Correction for MTBE to 15°C. Pages: 4
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Chapter 11.1
Volume Correction Factors—Volume IV

Table 23A—Generalized Crude Oils, Correction of Observed Relative Density to Relative Density at 60/60°F.
Table 24A—Generalized Crude Oils, Correction of Volume to 60°F Against Relative Density 60/60°F.
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Chapter 11.1
Volume Correction Factors—Volume V

Table 23B—Generalized Products, Correction of Observed Relative Density to Relative Density at 60/60°F.
Table 24B—Generalized Products, Correction of Volume to 60°F Against Relative Density 60/60°F.
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Chapter 11.1
Volume Correction Factors—Volume VI

Table 24C—Volume Correction Factors for Individual and Special Applications, Volume Correction to 60°F Against Thermal Expansion Coefficients at 60°F.
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Chapter 11.1
Volume Correction Factors—Volume VII

Table 53A—Generalized Crude Oils, Correction of Observed Density to Density at 15°C.
Table 54A—Generalized Crude Oils, Correction of Volume to 15°C Against Density at 15°C.
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Chapter 11.1
Volume Correction Factors—Volume VIII

Table 53B—Generalized Products, Correction of Observed Density to Density at 15°C.
Table 54B—Generalized Products, Correction of Volume to 15°C Against Density at 15°C.
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Chapter 11.1
Volume Correction Factors—Volume IX

Table 54C—Volume Correction Factors for Individual and Special Applications, Volume Correction to 15°C Against Thermal Expansion Coefficients at 15°C.
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Chapter 11.1
Volume Correction Factors—Volume X

Background, Development, and Computer Documentation, including computer subroutines in Fortran IV for all volumes of Chapter 11.1, except Volumes XI/XII, XIII, and XIV. Implementation procedures, including rounding and truncating procedures, are also included. These subroutines are not available through API in magnetic or electronic form. Pages: 403
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Chapter 11.1
Volume Correction Factors—Volume XIII

Table 5D—Generalized Lubricating Oils, Correction of Observed API Gravity to API Gravity at 60°F.
Table 6D—Generalized Lubricating Oils, Correction of Volume to 60°F Against API Gravity at 60°F.
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Chapter 11.1
Volume Correction Factors—Volume XIV

Table 53D—Generalized Lubricating Oils, Correction of Observed Density to Density at 15°C.

Table 54D—Generalized Lubricating Oils, Correction of Volume to 15°C Against Density at 15°C.
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Chapter 11.2.1
Compressibility Factors for Hydrocarbons: 0–90° API Gravity Range
This chapter provides tables to correct hydrocarbon volumes metered under pressure to corresponding volumes at the equilibrium pressure for the metered temperature. It contains compressibility factors related to meter temperature and API gravity (60°F) of metered material. Pages: 149
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Chapter 11.2.1M
Compressibility Factors for Hydrocarbons: 638–1074 Kilograms per Cubic Meter Range
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Includes tables found in Chapters 11.2.1, 11.2.1M, 11.2.3 and 11.2.3M, along with a computer documentation manual containing text information from those chapters. The tables, presented in both standard and metric (SI) units, cover compressibility factors for hydrocarbons and water calibration of volumetric provers. The tape is 9-track, 1600 bpi, unlabeled, 4-file type, and is available in either ASCII or EBCDIC format. Format desired must be specified when ordering. Now available on disk. Please specify when ordering.
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6RS Referenced Standards for Committee 6, Standardization of Valves and Wellhead Equipment, 1st ed. 1990

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MPMS	Ch. 11.2.2	Compressibility Factors for Hydrocarbons: 0.350–0.637 Relative Density (60 °F/60 °F) and –50 °F to 140 °F Metering Temperature	2nd	1986	H27307	$166.00	42
MPMS	Ch. 11.2.2M	Compressibility Factors for Hydrocarbons: 350ñ637 Kilograms per Cubic Meter Density (15 °C) and –46 °C to 60 °C Metering Temperature	1st	1986	H27309	$166.00	42
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API	E5	Environmental Guidance Document: Waste Management in Exploration and Production Operations	2nd	1997	GE5002	$121.00	34
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Spec	Q1/ISO 29001	Specification for Quality Programs for the Petroleum and Natural Gas Industry—Russian	8th	2007	GQ1007R	$107.00	1
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RP	2A-WSD-S2	Errata/Supplement 2 to Planning, Designing and Constructing Fixed Offshore Platforms—Working Stress Design	21st	2005	G2AWSDS	$118.00	1
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RP	4G	Recommended Practice for Use and Procedures for Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures	3rd	2004	G04G03	$103.00	5
RP	5A3/ISO 13678	Recommended Practice on Thread Compounds for Casing, Tubing, Line Pipe, and Drill Stem	3rd	2009	GX5A303	$140.00	5
RP	5A5/ISO 15463	Field Inspection of New Casing, Tubing, and Plain-end Drill Pipe	7th	2005	GX5A507	$152.00	5

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RP	5C1	Recommended Practice for Care and Use of Casing and Tubing	18th	1999	G05C18	$111.00	5
TR	5C3/ISO 10400	Technical Report on Equations and Calculations for Casing, Tubing, and Line Pipe used as Casing or Tubing; and Performance Properties Tables for Casing and Tubing	1st	2008	G5C301	$200.00	5
RP	5C5/ISO 13679	Recommended Practice on Procedures for Testing Casing and Tubing Connections	3rd	2003	GX5C503	$158.00	5
RP	5C6	Welding Connections to Pipe	2nd	2006	G05C62	$83.00	5
RP	5C7	Recommended Practice for Coiled Tubing Operations in Oil and Gas Well Services	1st	1996	G05C71	$128.00	6
Spec	5CRA/ISO 13680	Specification for Corrosion Resistant Alloy Seamless Tubes for Use as Casing, Tubing and Coupling Stock	1st	2010	GG5CRA01	$150.00	6
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Spec	5DP/ISO 11961	Specification for Drill Pipe	1st	2009	GX5DP01	$175.00	6
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RP	5L7	Recommended Practice for Unprimed Internal Fusion Bonded Epoxy Coating of Line Pipe	2nd	1988	G02906	$86.00	6
RP	5L8	Field Inspection of New Line Pipe	2nd	1996	G05L82	$121.00	6
Spec	5L9	Recommended Practice for External Fusion Bonded Epoxy Coating of Line Pipe	1st	2001	G5L901	$76.00	7
Spec	5LC	Specification for CRA Line Pipe	3rd	1998	G05LC3	$152.00	7
Spec	5LCP	Specification on Coiled Line Pipe	2nd	2006	G5LCP2	$141.00 7	
Spec	5LD	CRA Clad or Lined Steel Pipe	3rd	2009	G05LD3	$125.00	7
RP	5LW	Recommended Practice for Transportation of Line Pipe on Barges and Marine Vessels	3rd	2009	G5LW03	$57.00	7
RP	5SI	Recommended Practice for Purchaser Representative Surveillance and/or Inspection at the Supplier	1st	2006	G5SI01	$55.00	7
Std	5T1	Standard on Imperfection Terminology	10th	2003	G05T10	$111.00	7
TR	5TRSR22	Technical Report in SR22 Supplementary Requirements for Enhanced Leak Resistance LTC	1st	2002	GSR221	$85.00	7
RP	5UE	Recommended Practice for Ultrasonic Evaluation of Pipe Imperfections	2nd	2005	G5UE02	$76.00	7
Spec	6A	Specification for Wellhead and Christmas Tree Equipment	19th	2004	GX06A19	$252.00	8, 103
Std	6A718	Nickel Base Alloy 718 (UNS N07718) for Oil and Gas Drilling and Production Equipment	2nd	2009	G6A7182	$85.00	8, 103
TR	6AF	Technical Report on Capabilities of API Flanges Under Combinations of Load	3rd	2008	G6AF03	$145.00	8
TR	6AF1	Technical Report on Temperature Derating of API Flanges Under Combination of Loading	2nd	1998	G06AF1	$152.00	8
TR	6AF2	Technical Report on Capabilities of API Integral Flanges Under Combination of Loading—Phase II	3rd	2008	G6AF23	$174.00	8
API	6AM	Technical Report on Material Toughness	2nd	1995	G06AM2	$73.00	8
Spec	6AV1	Specification for Verification Test of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service	1st	1996	G06AV1	$73.00	8
Spec	6AV1	Specification for Verification Test of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service	1st	1996	G06AV1	$73.00	103
Spec	6D/ISO 14313	Specification for Pipeline Valves	23rd	2008	GX6D23	$127.00	9, 103
RP	6DR	Repair and Remanufacture of Pipeline Valves	1st	2006	G06DR1	$73.00	9, 103
Spec	6DSS/ISO 14723	Specification for Subsea Pipeline Valves	2nd	2009	GX6DSS2	$160.00	9, 104
TR	6F1	Technical Report on Performance of API and ANSI End Connections in a Fire Test According to API Specification 6FA	3rd	1999	G06F13	$111.00	9
TR	6F2	Technical Report on Fire Resistance Improvements for API Flanges	3rd	1999	G06F23	$105.00	9
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Spec	6FC	Specification for Fire Test for Valves With Automatic Backseats	4th	2009	G06FC3	$94.00	10, 104
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RP	6HT	Heat Treatment and Testing of Large Cross Section and Critical Section Components	1st	2005	G6HT01	$73.00	10
Bull	6J	Testing of Oilfield Elastomers (A Tutorial)	2nd	1998	G03230	$76.00	10
TR	6J1	Elastomer Life Estimation Testing Procedures	1st	2000	G06J11	$76.00	10
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Spec	7-2/ISO 10424-2	Specification for Threading and Gauging of Rotary Shouldered Thread Connections	1st	2008	GX70201	$167.00	11
RP	7A1	Recommended Practice for Testing of Thread Compound for Rotary Shouldered Connections	1st	1992	G03305	$62.00	11

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Spec	7F	Oil Field Chain and Sprockets	7th	2003	G07F07	$112.00	11
RP	7G	Recommended Practice for Drill Stem Design and Operating Limits	16th	1998	G07G6A	$188.00	11
RP	7G-2/ ISO 10407-2	Recommended Practice for Drill Stem Element Inspection	1st	2009	GX7G201	$135.00	11
RP	7HU1	Safe Use of 2-Inch Hammer Unions for Oilfield Applications	1st	2009	H7HU11	$35.00	12
Spec	7K/ISO 14693	Specification for Drilling and Well Servicing Equipment	4th	2005	GX7K04	$176.00	12
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Spec	7NRV	Specification on Non-Return Valves	1st	2006	G7NRV01	$67.00	12
Spec	8A	Drilling and Production Hoisting Equipment	13th	1997	G08A13	$105.00	12
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Spec	9A/ISO 10425	Specification for Wire Rope	25th	2004	GX9A25	$95.00	13
RP	9B	Application, Care, and Use of Wire Rope for Oil Field Service	12th	2005	G09B12	$111.00	13
Spec	10A/ISO 10426-1	Specification for Cements and Materials for Well Cementing	23rd	2002	GX10A23	$128.00	13
RP	10B-2/ ISO 10426-2	Recommended Practice for Testing Well Cements	1st	2005	GX10B201	$205.00	13
RP	10B-3/ ISO 10426-3	Recommended Practice on Testing of Deepwater Well Cement Formulations	1st	2004	GG10B31	$74.00	13
RP	10B-4/ ISO 10426-4	Recommended Practice on Preparation and Testing of Foamed Cement Slurries at Atmospheric Pressure	1st	2004	GG10B41	$74.00	13
RP	10B-5/ ISO 10426-5	Recommended Practice on Determination of Shrinkage and Expansion of Well Cement Formulations at Atmospheric Pressure	1st	2005	GG10B501	$77.00	13
Spec	10D/ISO 10427-1	Specification for Bow-Spring Casing Centralizers	6th	2002	GX10D06	$86.00	13
RP	10D-2/ ISO 10427-2	Recommended Practice for Centralizer Placement and Stop Collar Testing	1st	2004	GG10D21	$74.00	14
RP	10F/ISO 10427-3	Recommended Practice for Performance Testing of Cementing Float Equipment	3rd	2002	GX10F03	$62.00	14
TR	10TR1	Cement Sheath Evaluation	2nd	2008	G10TR12	$140.00	14
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RP	11AR	Recommended Practice for Care and Use of Subsurface Pumps	4th	2000	G11AR4	$121.00	16
Spec	11AX	Specification for Subsurface Sucker Rod Pumps and Fittings	12th	2006	G11AX12	$130.00	16
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Bull	11L3	Sucker Rod Pumping System Design Book	1st	1970	G05800	$128.00	15
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RP	11S2	Electric Submersible Pump Testing	2nd	1997	G11S22	$80.00	16
RP	11S2	Electric Submersible Pump Testing—Russian	2nd	1997	G11S22	$84.00	16
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Bull	16J	Comparison of Marine Drilling Riser Analyses	1st	1992	G07246	$73.00	22
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Spec	16R	Marine Drilling Riser Couplings	1st	1997	G16R01	$94.00	23
Spec	16RCD	Drill Through Equipment—Rotating Control Devices	1st	2005	G16RCD01	$146.00	23
RP	16ST	Coiled Tubing Well Control Equipment Systems	1st	2009	G16ST01	$140.00	23
RP	17A/ISO 13628-1	Design and Operation of Subsea Production Systems—General Requirements and Recommendations	4th	2006	GX17A04	$176.00	23
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RP	31A	Standard Form for Hardcopy Presentation of Downhole Well Log Data	1st	1997	G31A01	$94.00	27
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RP	76	Contractor Safety Management for Oil and Gas Drilling and Production Operations	2nd	2007	see listing		31, 90
RS	076	Paying for Automobile Insurance at the Pump: A Critical Review		1994	(202) 682-8485		162
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Publ	337	Development of Emission Factors for Leaks in Refinery Components in Heavy Liquid Service		1996	J33700	$71.00	87, 128
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Std	527	Seat Tightness of Pressure Relief Valves—Russian	3rd	1991	C52700R	$66.00	77
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Std	560/ISO 13705	Fired Heaters for General Refinery Services	4th	2007	C56004	$293.00	81
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Std	662, Part 1/ ISO 15547-1	Plate Heat Exchangers for General Refinery Services, Part 1óPlate-and-Frame Heat	1st	2006	CX662101	$128.00	82
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RP	752	Management of Hazards Associated with Location of Process Plant Buildings	3rd	2009	K75203	$136.00	87, 90
RP	753	Management of Hazards Associated with Location of Process Plant Portable Buildings	1st	2007	K75301	$136.00	87, 90
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TR	932-A	The Study of Corrosion in Hydroprocess Reactor Effluent Air Cooler Systems		2002	C932A0	$146.00	84
Publ	932-B	Design, Materials, Fabrication, Operation, and Inspection Guidelines for Corrosion Control in Hydroprocessing Reactor Effluent Air Cooler (REAC) Systems	1st	2004	C932B1	$166.00	84
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Bull	939-E	Identification, Repair, and Mitigation of Cracking of Steel Equipment in Fuel Ethanol Service	1st	2008	C939E01	$136.00	85
RP	941	Steels for Hydrogen Service at Elevated Temperatures and Pressures in Petroleum Refineries and Petrochemical Plants	7th	2008	C94107	$121.00	85
TR	941	The Technical Basis Document for API RP 941	1st	2008	C09410	$192.00	86
RP	945	Avoiding Environmental Cracking in Amine Units	3rd	2003	C94503	$98.00	86
Publ	958	Pilot Studies on the Toxicity of Effluents from Conventional And Carbon enhanced Treatment of Refinery Wastewater-Phase III		1981	see listing		88
TR	997	Comprehensive Report of API Crude Oil Characterization Measurements	1st	2000	C99701	$204.00	83
RP	1004	Bottom Loading & Vapor Recovery for MC-306 Tank Motor Vehicles	8th	2003	D10048	$107.00	58
RP	1007	Loading and Unloading of MC 306/DOT 406 Cargo Tank Motor Vehicles	1st	2001	A10071	$37.00	58
RP	1102	Steel Pipelines Crossing Railroads and Highways	7th	2007	D11021	$112.00	63
Std	1104	Welding of Pipelines and Related Facilities	20th	2005	D110420	$286.00	63, 67
RP	1109	Marking Liquid Petroleum Pipeline Facilities	3rd	2003	D11093	$86.00	64
RP	1110	Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids or Carbon Dioxide	5th	2007	D11105	$93.00	64
RP	1111	Recommended Practice for the Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines (Limited State Design)	4th	2009	D11114	$129.00	64
RP	1112	Developing a Highway Emergency Response Plan for Incidents Involving Hazardous Materials	3rd	1997	A11123	$73.00	59
RP	1113	Developing a Pipeline Supervisory Control Center	1st	2007	D11131	$82.00	64
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RP	1115	Operation of Solution-Mined Underground Storage Facilities	1st	1994	D11151	$83.00	64
RP	1117	Recommended Practice for Movement in In-Service Pipelines	3rd	2008	D11173	$128.00	65
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RP	1125	Overfill Control Systems for Tank Barges	1st	1991	E11250	$63.00	53
RP	1127	Marine Vapor Control Training Guidelines	1st	1993	E11270	$118.00	53
RP	1130	Computational Pipeline Monitoring for Liquids Pipelines	1st	2007	D011301	$108.00	65
Publ	1132	Effects of Oxygenated Fuels and Reformulated Diesel Fuels on Elastomers and Polymers in Pipeline/Terminal Components		1994	D11321	$98.00	65

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RP	1133	Guidelines for Onshore Hydrocarbon Pipelines Affecting High Consequence Floodplains	1st	2005	D11331	$79.00	65
RP	1141	Guidelines for Confined Space Entry on Board Tank Ships in the Petroleum Industry	1st	1994	E11411	$80.00	53
Publ	1149	Pipeline Variable Uncertainties and Their Effects on Leak Detectability	1st	1993	D11491	$182.00	65
Publ	1156 & 1156-A	Effects of Smooth and Rock Dents on Liquid Petroleum Pipelines, Phase I and Phase II			see listing		65
Publ	1157	Hydrostatic Test Water Treatment and Disposal Options for Liquid Pipeline Systems	1st	1998	D11571	$227.00	66
Publ	1158	Analysis of DOT Reportable Incidents for Hazardous Liquid Pipelines, 1986 through 1996	1st	1999	D11581	$57.00	66
Std	1160	Managing System Integrity for Hazardous Liquid Pipelines	1st	2001	D11601	$186.00	66
Publ	1161	Guidance Document for the Qualification of Liquid Pipeline Personnel	1st	2000	D11611	$227.00	66
RP	1162	Public Awareness Programs for Pipeline Operators	1st	2003	D11621	$93.00	66
Std	1163	In-line Inspection Systems Qualification Standard	1st	2005	D11631	$118.00	66
Std	1164	Pipeline SCADA Security	2nd	2009	D11642	$141.00	62, 67
RP	1165	Recommended Practice for Pipeline SCADA Displays	1st	2007	D11651	$147.00	67
RP	1166	Excavation Monitoring and Observation	1st	2005	D11661	$102.00	67
RP	1168	Pipeline Control Room Management	1st	2008	D11681	$80.00	67
Publ	1509	Engine Oil Licensing and Certification System	15th	2002	F150915	$127.00	59
Publ	1520	Directory of Licensees: API Engine Oil Licensing and Certification System			www.api.org		59
RP	1525	Bulk Oil Testing, Handling, and Storage Guidelines	1st	1997	F15251	$63.00	57
API/EI Std	1529	Aviation Fuelling Hose	6th	2005	A152906	$128.00	55
API/EI RP	1540	Design, Construction, Operation and Maintenance of Aviation Fueling Facilities, IP Model Code of Safe Practice Part 7	1st	2004	A15401	$206.00	55
API/EI Std	1542	Identification Markings for Dedicated Aviation Fuel Manufacturing and Distribution Facilities, Airport Storage and Mobile Fuelling Equipment	8th	2007	A15427	$128.00	55
RP	1543	Documentation, Monitoring and Laboratory Testing of Aviation Fuel during shipment from Refinery to Airport	1st	2009	A154301	$57.00	55
API/EI	1550	Handbook on Equipment Used for the Maintenance and Delivery of Clean Aviation Fuel	1st	2007	A155001	$289.00	55
Publ	1571	Diesel Fuel—Questions and Answers for Highway and Off-Highway Use	4th	1996	see listing		59
API/EI Spec	1581	Specification and Qualification Procedures for Aviation Jet Fuel Filter/Separators	5th	2002	A15815	$174.00	56
API/EI Spec	1582	Specification for Similarity for API/EI 1581 Aviation Jet Fuel Filter/Separators	1st	2001	A15822	$136.00	56
API/EI Spec	1584	Four-inch Aviation Hydrant System Components and Arrangements	3rd	2001	A15843	$174.00	56
API/EI Publ	1585	Guidance in the Cleaning of Aviation Fuel Hydrant Systems at Airports	2nd	2007	A158502	$186.00	56
API/EI Spec	1590	Specifications and Qualification Procedures for Aviation Fuel Microfilters	2nd	2002	A15902	$136.00	56
Publ	1593	Gasoline Marketing in the United States Today	3rd	1992	A15930	$111.00	55
API/EI RP	1594	Initial Pressure Strength Testing of Airport Fuel Hydrant Systems with Water	2nd	2007	A15941	$120.00	56
API/EI RP	1595	Design, Construction, Operation, Maintenance, and Inspection of Aviation Pre-Airfield Storage Terminals	1st	2006	A159501	$174.00	56
API/EI Spec	1596	Design and Construction of Aviation Fuel Filter Vessels	1st	2006	A159601	$136.00	56
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RP	1604	Closure of Underground Petroleum Storage Tanks	3rd	1996	A16043	$73.00	57, 98
Publ	1612	Guidance Document for Discharging of Petroleum Distribution Terminal Effluents to Publicly Owned Treatment Works	1st	1996	A16121	$94.00	59
RP	1615	Installation of Underground Petroleum Storage Systems	5th	1996	A16155	$118.00	57, 98
Publ	1621	Bulk Liquid Stock Control at Retail Outlets	5th	1993	A16210	$80.00	57
RP	1626	Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Service Stations	1st	1985	A16260	$57.00	57
RP	1627	Storage and Handling of Gasoline-Methanol/Cosolvent Blends at Distribution Terminals and Service Stations	1st	1986	A16270	$57.00	57
Publ	1628	A Guide to the Assessment and Remediation of Underground Petroleum Releases	3rd	1996	A16283	$159.00	60
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Publ	1628E	Operation and Maintenance Considerations for Hydrocarbon Remediation Systems	1st	1996	A1628E	$57.00	60
Publ	1629	Guide for Assessing and Remediating Petroleum Hydrocarbons in Soils	1st	1993	A16290	$145.00	60
RP	1631	Interior Lining and Periodic Inspection of Underground Storage Tanks	5th	2001	A16315	$83.00	57, 98
RP	1632	Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems	3rd	1996	A16323	$63.00	57, 98

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Publ	1639	Owner/Operator's Guide to Operation and Maintenance of Vapor Recovery Systems at Gasoline Dispensing Facilities	1st	2003	A16391	$83.00	58
Publ	1642	Alcohol, Ethers, and Gasoline-Alcohol and Gasoline-Ether Blends	1st	1996	A16421	$58.00	58
Publ	1645	Stage II Cost Study	1st	2002	A16451	$55.00	58
RP	1650	Set of Six API Recommended Practices on Underground Petroleum Storage Tank Management			A16502	$287.00	58, 98
Publ	1659	Keeping it Clean: Making Safe and Spill-Free Motor Fuel Deliveries	1st	1992	A16590	$94.00	59
Publ	1669	Results of a Retail Gasoline Outlet and Commercial Parking Lot Storm Water Runoff Study	1st	1994	A16691	$80.00	59
Publ	1673	Compilation of Air Emission for Petroleum Distribution Dispensing Facilities	2nd	2009	A16732	$78.00	55
Publ	1835	Study of Used Oil Recycling in Eleven Selected Countries	1st	1997	B183501	$57.00	58
Std	2000/ISO 28300	Venting Atmospheric and Low-pressure Storage Tanks	6th	2009	CX20006	$143.00	77, 98
RP	2001	Fire Protection in Refineries	8th	2005	K20018	$96.00	91
Std	2003	Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents	7th	2008	K20037	$121.00	91
RP	2009	Safe Welding, Cutting and Hot Work Practices in the Petroleum and Petrochemical Industries	7th	2002	K20097	$76.00	91
Std	2015	Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks	6th	2001	K20156	$130.00	93, 98
RP	2016	Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks	1st	2001	K20161	$186.00	93, 98
RP	2021	Management of Atmospheric Storage Tank Fires	4th	2001	K20214	$130.00	93, 98
RP	2023	Guide for Safe Storage and Handling of Heated Petroleum Derived Asphalt Products and Crude Oil Residua	3rd	2001	K20233	$106.00	93
Publ	2026	Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service	2nd	1998	K20262	$60.00	93, 98
RP	2027	Ignition Hazards Involved in Abrasive Blasting of Atmospheric Storage Tanks in Hydrocarbon Service	3rd	2002	C20273	$71.00	91
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RP	2200	Repairing Crude Oil, Liquefied Petroleum Gas and Product Pipelines	3rd	1994	D22003	$57.00	67
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RP	2216	Ignition Risk of Hydrocarbon Vapors by Hot Surfaces in the Open Air	2nd	2003	K22160	$57.00	92
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Publ	2384	2005 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only		2006	K23841	$100.00	92, 131
Std	2510	Design and Construction of LPG Installations	8th	2001	C25108	$100.00	76, 99
Publ	2510A	Fire Protection Considerations for the Design and Operation of Liquefied Petroleum Gas (LPG) Storage Facilities	2nd	1996	K2510A	$98.00	93

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Std	2552	Measurement and Calibration of Spheres and Spheroids	1st	1966	H25520	$94.00	36
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Std	2610	Design, Construction, Operation, Maintenance & Inspection of Terminal and Tank Facilities	2nd	2005	C26102	$118.00	58, 99
Publ	4261	Alcohols and Ethers: A Technical Assessment of Their Application as Fuels and Fuel Components	3rd	2001	C42613	$157.00	86
Publ	4262	Methanol Vehicle Emissions		1990	F42620	$121.00	86
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Publ	4479	1989 Oil Spill Conference Proceedings			I44790	$55.00	151
Publ	4525	A Compilation of Field-collected Cost and Treatment Effectiveness Data for the Removal of Dissolved Gasoline Components from Groundwater		1990	I45250	$76.00	139
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Publ	4608	User's Guide: Evaluation of Sediment Toxicity Tests for Biomonitoring Programs		1994	I46080	$57.00	153
Publ	4609	In-situ Air Sparging: Evaluation of Petroleum Industry Sites and Considerations for Applicability, Design and Operation		1995	I46090	$94.00	139
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Publ	4641	Summary of Produced Water Toxicity Identification Evaluation Research		1996	I46410	$85.00	147
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Shipments are F.O.B., Englewood, Colorado, USA.

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Shipping (U.S. Orders) – Orders shipped within the U.S. are sent via traceable means. Most orders are shipped the same day. Subscription updates are sent by First-Class Mail. Other options, including next-day service, air service, and fax transmission are available at additional cost. Call 1-800-854-7179 for more information.

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2010 Meetings and Training Calendar

Date	Event	Location
April 6-8	**Toxic Release Inventory (TRI) RY2009 Workshop**	New Orleans, LA
April 12	**API RP 752 and 753: Facility Siting Regulations and Compliance**	Houston, TX
April 12-13	**Facility Siting Update: Process Plant Building Hazard Management**	Houston, TX
April 12-13	**Workshop on USCG Regulations for Facility Security Officers (FSOs)**	Houston, TX
April 12-14	**API Risk Based Inspection**	Houston, TX
April 12-16	**API Rotor Repair Course**	La Porte, TX
April 13	**Facility Siting Consequence Analysis Techniques**	Houston, TX
April 14-15	**Workshop on Security Vulnerability Assessments (SVAs)**	Houston, TX
April 19-20	**Annual API Federal Tax Forum**	Houston, TX
April 19-23	**Developing a New Generation of Oil and Gas Leaders: Strategic Financial Skills**	Dallas, TX
April 20-22	**API Damage Mechanisms**	New Orleans, LA
April 20-22	**Pipeline Conference and Cybernetics Symposium**	New Orleans, LA
April 21	**PIDX International European Spring Meeting**	Milan, Italy
April 26-28	**Spring Refining and Equipment Standards Meeting**	New Orleans, LA
April 26-30	**Developing a New Generation of Oil and Gas Leaders: Strategic Leadership Skills**	Dallas, TX
April 27	**Spring API/NPRA Operating Practices Symposium**	New Orleans, LA
April 27-28	**API Specification Q1 Training**	Houston, TX
May 3-4	**Workshop on USCG Regulations for Facility Security Officers (FSOs)**	San Francisco, CA
May 5-6	**Workshop on Security Vulnerability Assessments (SVAs)**	San Francisco, CA
May 6	**API Pipeline Valve Specifications 6D and 6DSS**	Houston, TX
May 11	**Inspection of FRP and Plastic Tanks**	Titusville, PA
May 11-12	**Pipeline Fundamentals**	Houston, TX
May 11-13	**Specifying Reliable Cost Effective Machinery Designs**	Houston, TX
May 11-13	**API Pressure Relieving Systems**	Philadelphia, PA
May 13	**Training on the Inspection of Steel Aboveground Storage Tanks**	Titusville, PA
May 18-19	**Introduction to Aboveground Storage Tanks**	Titusville, PA
June 3-4	**Overview of API Specification 6A**	Houston, TX
June 7-11	**API Rotor Repair Course**	Edmonton, AB Canada
June 8-9	**API Specification Q1 Training**	Houston, TX
June 15-17	**API Risk Based Inspection**	San Francisco, CA
June 15-17	**API Damage Mechanisms**	Philadelphia, PA
June 22-24	**API Fitness-for-Service Course**	Shaker Heights, OH
June 28-Jul. 2	**Exploration & Production Standards Conference on Oilfield Equipment and Materials**	Washington, DC
June 28-29	**2010 Tanker Conference with United States Coast Guard Benkert Awards**	San Diego, CA
July 13	**Inspection of FRP and Plastic Tanks**	Titusville, PA
July 15	**Training on the Inspection of Steel Aboveground Storage Tanks**	Titusville, PA
July 20-21	**Introduction to Aboveground Storage Tanks**	Titusville, PA
August 9-10	**API Fitness-for-Service Inspectors**	Houston, TX
August 17-19	**API Pressure Relieving Systems**	San Francisco, CA
August 24-26	**API Fitness-for-Service Course**	Philadelphia, PA
September 14	**Inspection of FRP and Plastic Tanks**	Titusville, PA
September 14-15	**API Specification Q1 Training**	Houston, TX
September 14-16	**API Damage Mechanisms**	Shaker Heights, OH
September 14-16	**API Pressure Relieving Systems**	Edmonton, AB, Canada
September 16	**Training on the Inspection of Steel Aboveground Storage Tanks**	Titusville, PA
September 21-22	**Introduction to Aboveground Storage Tanks**	Titusville, PA

2010 Meetings and Training Calendar

Date	Event	Location
September 23-24	**Overview of API Specification 6A**	Houston, TX
September 27-28	**Workshop on USCG Regulations for Facility Security Officers (FSOs)**	Washington, DC
September 28-30	**API Risk Based Inspection**	Philadelphia, PA
September 29-30	**Workshop on Security Vulnerability Assessments (SVAs)**	Washington, DC
October 4-7	**Fall Committee on Petroleum Measurement Standards Meeting**	Westminster, Co
October 5-7	**API Fitness-for-Service Course**	San Francisco, CA
October 18-21	**Storage Tank Conference and Safe Tank Entry Workshop**	TBD
October 19	**Inspection of FRP and Plastic Tanks**	Titusville, PA
October 19-20	**API Specification Q1 Training**	Houston, TX
October 21	**Training on the Inspection of Steel Aboveground Storage Tanks**	Titusville, PA
October 25-26	**Workshop on USCG Regulations for Facility Security Officers (FSOs)**	Houston, TX
October 25-26	**Overview of API Specification 6A**	Aberdeen, Scotland, UK
October 26-28	**API Fitness-for-Service Course**	Edmonton, AB, Canada
October 26-27	**Introduction to Aboveground Storage Tanks**	Titusville, PA
October 27-28	**Workshop on Security Vulnerability Assessments (SVAs)**	Houston, TX
November 1-5	**API Rotor Repair Course**	Bethlehem, PA
November 2-4	**API Damage Mechanisms**	San Francisco, CA
November 8-9	**Workshop on USCG Relations for Facility Security Officers (FSOs)**	San Francisco, CA
November 8-10	**API Risk Based Inspection**	New Orleans, LA
November 9	**Inspection of FRP and Plastic Tanks**	Titusville, PA
November 10-11	**Workshop on Security Vulnerability Assessments (SVAs)**	San Francisco, CA
November 11	**Training on the Inspection of Steel Aboveground Storage Tanks**	Titusville, PA
November 12	**API Pipeline Valve Specifications 6D and 6DSS**	Houston, TX
November 15-17	**Fall Refining and Equipment Standards Meeting**	Nashville, TN
November 16-17	**Introduction to Aboveground Storage Tanks**	Titusville, PA
November 16	**Fall API/NPRA Operating Practices Symposium**	Nashville, TN
December 9-10	**Overview of API Specification 6A**	Houston, TX

For more information on these and other API meetings, visit www.api.org/meetings or www.api-u.org.