Serving the oil and natural gas industry with information

API is pleased to present its 2014 publications programs and services catalog.

The 2014 edition lists API standards, recommended practices, equipment specifications, other technical documents, and reports and studies to help the oil and natural gas industry safely, efficiently, and responsibly supply energy to billions of people around the world.

Each year API distributes more than 300,000 copies of its publications.

For upstream, API publications cover offshore structures and floating production systems, tubular goods, valves and wellhead equipment, plus drilling and production equipment. In the downstream arena, API publications address marketing and pipeline operations and refinery equipment, including storage tanks, pressure-relieving systems, compressors, turbines, and pumps. API also has publications that cut across industry sectors, covering fire and safety protection and petroleum measurement. API information technology standards cover EDI, e-business, telecommunications, and information technology applications for the oil and natural gas industry.

Other API publications cataloged here include economic analysis, toxicological test results, opinion research reports, and educational materials that provide basic information about the oil and natural gas industry and how technology is transforming it.

The publications in the catalog are intended for API members and non-members.

Please direct questions about the catalog to the API Standards department at 202-682-8417.

Sincerely,

John Modine
Vice President, Global Industry Services
API
IHS Standards Expert is your standards management tool to navigate through American Petroleum Standards (API). Quickly find the right standard, link to related documents, integrate internal documents, manage project lists, share data with geographically dispersed teams, and remain up-to-date on changes.

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**Questions?**

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Spec Q1 ♦ Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry

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 are intended that the processes and practices established herein can be adapted and applied from a single piece of tagged equipment to a complex petrochemical facility. The process described is intended to be applied at a system level. The systems completion process is the sequential activities within a project that verify and prove the construction, installation, integration, testing, and preparation of systems have been completed as designed, and thus, the facility is ready for start-up and operations. The systems completion process is designed to help prepare and manage the transfer of care, custody, and control of facilities under construction through appropriate certification and documentation, such that the details of progress are evident. Pages: 47

9th Edition | June 2013 | Product Number: G0Q109 | Price: $120.00

You may access Spec Q1 in a read-only platform: publications.api.org

Spec Q2 ♦ Specification for Quality Management System Requirements for Service Supply Organizations for the Petroleum and Natural Gas Industries

Defines the quality management system requirements for service supply organizations for the petroleum and natural gas industries. It is intended to apply to the provision of services during exploration, development, and production in the oil and gas industry. This includes activities involved in upstream oil and gas well construction, production, and abandonment. It is intended to apply when specified by the operator to the service provided. This document specifies requirements of a quality management system to demonstrate an organization's ability to consistently provide services that meet customer and applicable statutory and regulatory requirements, including processes for continual improvement of the system and the assurance of conformity to customer and applicable and regulatory requirements. Pages: 21

1st Edition | December 2011 | Product Number: G0Q201 | Price: $80.00

Spec Q2 ★ Specification for Quality Management System Requirements for Service Supply Organizations for the Petroleum and Natural Gas Industries—Chinese

Chinese translation of Spec Q2.

1st Edition | December 2011 | Product Number: G0Q201C | Price: $56.00

RP 1FSC ♦ Facilities Systems Completion Planning and Execution

Applies to a wide variety of projects within the oil and gas industry excluding subsurface. Although intended for oil and gas industry, the process described in this document can be applied to other industries as well. It is intended that the processes and practices established herein can be adapted and applied from a single piece of tagged equipment to a complex petrochemical facility. The process described is intended to be applied at a system level. The systems completion process is the sequential activities within a project that verify and prove the construction, installation, integration, testing, and preparation of systems have been completed as designed, and thus, the facility is ready for start-up and operations. The systems completion process is designed to help prepare and manage the transfer of care, custody, and control of facilities under construction through appropriate certification and documentation, such that the details of progress are evident. Pages: 11

1st Edition | July 2013 | Product Number: G1FSCO1 | Price: $60.00

TR 1PER15K-1 ♦ Protocol for Verification and Validation of High-Pressure, High-Temperature Equipment

Focuses on an evaluation process for high-pressure high-temperature (HPHT) equipment in the petroleum and natural gas industries, which includes design verification analysis, design validation, material selection considerations, and manufacturing process controls necessary to ensure the equipment is fit-for-service in the applicable HPHT environment. HPHT environments are intended to mean that one or more of the following well conditions exist:

- the completion of the well requires completion equipment or well control equipment assigned a temperature rating greater than 350 °F or a pressure rating greater than 15,000 psig;

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This publication is a new entry in this catalog. ♦ This publication is related to an API licensing, certification, or accreditation program.
• the maximum anticipated surface pressure or shut-in tubing pressure is greater than 15,000 psig on the seafloor for a well with a subsea wellhead or at the surface for a well with a surface wellhead; or
• the flowing temperature is greater than 350 °F on the seafloor for a well with a subsea wellhead or on the surface for a well with a surface wellhead.

The design verification and validation protocols in this report are used as a guide by the various API subcommittees to develop new and revised standards on equipment specifications for HPHT service. This report is not intended to replace existing API equipment specifications but to supplement them by illustrating accepted practices and principles that may be considered in order to maintain the safety and integrity of the equipment. This report is intended to apply to the following equipment: wellheads, tubing heads, tubulars, packers, connections, seals, seal assemblies, production trees, chokes, and well control equipment. It may be used for other equipment in HPHT service. Pages: 90

1st Edition | March 2013
Product Number: GIPER15K11 | Price: $147.00

**OFFSHORE STRUCTURES**

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Exploration and Production

Fax Orders: 303-397-2740

Spec 2F  •  Mooring Chain
Covers flash-welded chain and forged center connecting links used for mooring of offshore floating vessels such as drilling vessels, pipe lay barges, derrick barges, and storage tankers. Pages: 16
Product Number: G02F06 | Price: $89.00

Spec 2F  •  Mooring Chain—Chinese
Chinese translation of Spec 2F.
6th Edition | June 1997 | Product Number: G02F06C | Price: $63.00

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 Section 18 of 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 RP 75 and the RP 14 series. The interface with these documents is identified and emphasized throughout, as structural engineers need to work closely with facilities engineers experiencing in performing hazard analysis as described in RP 14J and with the operator’s safety management system as described in RP 75. Pages: 63
1st Edition | April 2006 | Reaffirmed: January 2012
Product Number: G2FB01 | Price: $157.00

RP 2FPS  •  Planning, Designing, and Constructing Floating Production Systems
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, project storage, and export. This document addresses only floating systems where a buoyant hull of some form supports the electric production, and other systems. Bottom-fixed components, such as self-supporting risers, and station keeping systems, such as turret mooring, catenary anchor leg mooring, single anchor leg mooring, etc. are considered as ancillary components and are addressed in more detail in other API recommended practices. Pages: 191
2nd Edition | October 2011 | Product Number: G2FPS02 | Price: $186.00
You may access RP 2FPS in a read-only platform: publications.api.org

RP 2GEO/ISO 19901-4:2003  •  Geotechnical and Foundation Design Considerations
Contains requirements and recommendations for those aspects of geoscience and foundation engineering that are applicable to a broad range of offshore structures, rather than to a particular structure type. Such aspects are site characterization, soil and rock characterization, design and installation of foundations supported by the seabed (shallow foundations), identification of hazards, and design of pile foundations. Aspects of soil mechanics and foundation engineering that apply equally to offshore and onshore structures are not addressed. The user of this document is expected to be familiar with such aspects. Pages: 103
1st Edition | April 2011 | Product Number: G62GEO01 | Price: $154.00

Online Orders: www.global.ihs.com

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 that must resist impact, plastic fatigue loading, and lamellar tearing. These steels are intended for fabrication primarily by cold forming and welding as per 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
Reaffirmed: January 2012 | Product Number: G02H09 | Price: $94.00

Bull 2HINS  •  Guidance for Post-Hurricane Structural Inspection of Offshore Structures
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 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 recommended practices for the structure, as well as any structure specific owner or regulatory requirements. Pages: 16
1st Edition | May 2009 | Product Number: G2HINS01 | Price: $83.00

RP 2I  •  In-Service Inspection of Mooring Hardware for Floating Structures
Provides guidelines for inspecting mooring components of mobile offshore drilling units (MODUs) and permanent floating installations. In this edition:
• 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; and
• 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 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: G02I03 | Price: $148.00

Bull 2INT-DG  •  Interim Guidance for Design of Offshore Structures for Hurricane Conditions
Provides guidance on the use of updated hurricane winds, waves, surge, and current conditions in 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 RP 2A-WSD;
• tension leg platforms; and
• moored, floating platforms (semi-submersible shaped, spar shaped, ship shaped).
Bull 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: $57.00

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Conditions are presented for four regions: West, West Central, Central, and East. The understanding to date of the regional dependence of storm intensity has been derived for reference by other API standards. A new set of hurricane conditions has affected the Gulf, resulting in increases to local extremes in the East. 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; and
- moored, floating platforms (semi-submersible shaped, spar shaped, ship shaped).

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

1st Edition | May 2007 | Product Number: G2EXIT | Price: $57.00

Bull 2INT-MET
Interim Guidance on Hurricane Conditions in the Gulf of Mexico (includes Errata 1 dated October 2007)

Provides guidance on the use of updated hurricane winds, waves, surge, and current conditions in 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; and
- moored, floating platforms (semi-submersible shaped, spar shaped, ship shaped).

Bull 2INT-MET should be used in conjunction with RP 2A-WSD, Bull 2TD, RP 2F, RP 2FP, RP 2SK, and RP 2RD. Pages: 11

1st Edition | May 2007 | Product Number: G2EXINT | Price: $57.00

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: January 2012 | Product Number: G02L04 | Price: $85.00

RP 2MOP/ISO 19901-6:2009
Marine Operations

Provides requirements and guidance for the planning and engineering of marine operations, encompassing the design and analysis of the components, systems, equipment, and procedures required to perform marine operations, as well as the methods or procedures developed to carry them out safely. This document is also applicable to modifications of existing structures, e.g. installation of additional topsides modules. This edition of API RP 2MOP is the identical national adoption of ISO 19901-6:2009. Pages: 168

1st Edition | July 2010 | Product Number: G02MOP1 | Price: $243.00

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

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 Spec 2B. The primary use of these steels is for Class “B” applications as defined in RP 2A-WSD. Spec 2H, Spec 2W, and Spec 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
Reaffirmed: January 2012 | Product Number: G2MT12 | Price: $83.00

RP 2N
Planning, Designing, and Constructing Structures and Pipelines for Arctic Conditions (includes Errata 1 dated December 2009)

Contains considerations that are unique for planning, designing, and constructing arctic systems. Used with other applicable codes and standards like RP 2A-WSD 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 the following:

- 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; and
- shore crossings for pipelines. Pages: 82

Product Number: G02N02 | Price: $142.00

Spec 2MT2 ◆
Rolled Shapes with Improved Notch Toughness

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 RP 2A-WSD, with Class C being for the least critical applications. For special critical applications, Class A8 shapes may be specified, by agreement, using Supplement S101. Pages: 1

1st Edition | June 2002 | Effective Date: December 1, 2002
Reaffirmed: October 2010 | Product Number: G2MT21 | Price: $79.00

RP 2RD ◆
Dynamic Risers for Floating Production Systems

Addresses structural analysis procedures, design guidelines, component selection criteria, and typical designs for all new riser systems used on floating production systems (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 RP 17B and Spec 17J. Pages: 81

2nd Edition | September 2013
Product Number: G2RD02 | Price: $245.00
You may access RP 2RD in a read-only platform: publications.api.org

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-wheel 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

Product Number: G02S02 | Price: $76.00
Spec 2SC | Manufacture of Structural Steel Castings for Primary Offshore Applications

Castings manufactured to this specification are intended for use in the fabrication of offshore structures, manufacture of critical marine or mechanical or other system components intended for application on permanent offshore structures, or for components used in the construction of offshore tendons, risers, and pipelines. This specification is based on the experience acquired during the design, construction, operation, and maintenance of offshore processing units and permanent facilities, as supplemented with the experience of operating companies with topsides, fixed platforms, floating structures (e.g., tension leg platforms and spars), and their tendons and risers. Castings in these applications tend to be limited production components, with relatively few replications, and receive more intense scrutiny than routine mass production runs. Pages: 29

1st Edition | September 2009 | Effective Date: March 1, 2010
Product Number: G2SC01 | Price: $114.00

Spec 2SF | Manufacture of Structural Steel Forgings for Primary Offshore Applications

Castings manufactured to this specification are intended for use in the fabrication of offshore structures, manufacture of critical marine or mechanical or other system components intended for application on permanent offshore structures, or for components used in the construction of offshore tendons, risers, and pipelines. This specification is based on the experience acquired during the design, construction, operation, and maintenance of offshore processing units and permanent facilities, as supplemented with the experience of operating companies with topsides, fixed platforms, floating structures (e.g., tension leg platforms and spars), and their tendons and risers. Castings in these applications tend to be limited production components, with relatively few replications, and receive more intense scrutiny than routine mass production runs. Pages: 26

1st Edition | August 2013 | Product Number: G2SF01 | Price: $85.00

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 RP 2SK replaces RP 95F: Pages 181

3rd Edition | October 2005 | Product Number: G2SK03 | Price: $127.00
You may access RP 2SK in a read-only platform: publications.api.org

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

Includes Addendum 1 dated May 2007

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: $170.00
You may access RP 2SM in a read-only platform: publications.api.org

RP 2T | Planning, Designing, and Constructing Tension Leg Platforms

Contains a guide to the designer in organizing an efficient approach to the design of a tension leg platform. Emphasis is placed on participation of all engineering disciplines during each stage of planning, development, design, construction, installation, and inspection. This publication contains guidelines developed from the latest practices in designing tension leg platforms and are adapted from successful techniques employed for related structural systems in the offshore and marine industries. Pages: 254

3rd Edition | July 2010 | Product Number: G02T03 | Price: $227.00
You may access RP 2T in a read-only platform: publications.api.org

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. Bull 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: $51.00

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: G02U03 | Price: $191.00

Bull 2V | Design of Flat Plate Structures

Includes Errata 1 dated March 2008

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

3rd Edition | June 2004 | Product Number: G02V03 | Price: $191.00

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 that 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
Reaffirmed: January 2012 | Product Number: G02W05 | Price: $94.00

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

Russian translation of Spec 2W.

5th Edition | December 2006 | Product Number: G02W05R | Price: $76.00

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

Contains guidance on commonly used nondestructive examination (NDE) methods such as visual (VT), penetrant (PT), magnetic particle (MT), radiography (RT), and ultrasonic (UT) examinations, which are routinely used.* 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.

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**This publication is a new entry in this catalog.  ◆ This publication is related to an API licensing, certification, or accreditation program.
in offshore structural fabrication. This recommended practice primarily addresses the MT and UT methods. Guidance on VT, PT, and RT is incorporated by reference to AWS D1.1. Further recommendations are offered for determining the qualifications of personnel using MT and UT techniques. Recommendations are also offered for the integration of these techniques into a general quality control program. The interrelationship between joint design, the significance of defects in welds, and the ability of NDE personnel to detect critical-size defects is also discussed. Pages: 77

Product Number: G02X04 | Price: $147.00

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 that 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
Reaffirmed: January 2012 | Product Number: G02Y05 | Price: $94.00

RP 2Z
Preparation Qualification for Steel Plates for Offshore Structures
Covers requirements for preparation 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, Spec 2W and Spec 2Y. However, it may be used as a supplement to other material specifications (e.g. Spec 2H) if so desired. Pages: 19

Product Number: G02Z04 | Price: $119.00

RP 95J
Gulf of Mexico Jackup Operations for Hurricane Season—Interim Recommendations
Presents an interim approach to siting jackup mobile offshore drilling units 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 nonsheltered location. This recommended practice 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 recommended practice was developed through a cooperative arrangement with the International Association of Drilling Contractors’ Jackup Rig Committee. Specifically, this recommended practice 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

Product Number: G95J01 | Price: $62.00
You may access RP 95J in a read-only platform: publications.api.org

DECK AND MASTS
Spec 4F
Specification for 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 specification provides two product specification levels that define two levels of technical and quality requirements. Pages: 52

4th Edition | January 2013 | Effective Date: August 1, 2013
Product Number: G04G04 | Price: $115.00

Spec 4F *
Specification for Drilling and Well Servicing Structures—Chinese
Chinese translation of Spec 4F.


RP 4G
Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures
(includes Errata 1 dated September 2013)
Provides guidelines and establishes recommended procedures for inspection, maintenance, and repair of items for drilling and well servicing structures in order to maintain the serviceability of this equipment. The information in this document should be considered as supplemental to, and not as a substitute for, the manufacturer’s instructions and the recommendations in RP 54. Items of drilling and well servicing structures covered by this document include:

• masts/derricks and accessories and
• substructures and accessories.

Crown block sheaves and bearings are covered under RP 88. Offshore masts, derricks, substructures, and accessories are not under the scope of this document relative to 6.2.4, Category IV inspection requirements. Pages: 57


RP 4G *
Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures—Chinese
Chinese translation of RP 4G.

4th Edition | April 2012 | Product Number: G04G04C | Price: $82.00

TUBULAR GOODS
RP 5A3/ISO 13678:2010
Recommended Practice on Thread Compounds for Casing, Tubing, Line Pipe, and Drill Stem Elements
(includes Errata 1 dated April 2011)
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 13678:2010. Pages: 47

3rd Edition | November 2009 | Product Number: G5A303 | Price: $145.00

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This publication is a new entry in this catalog. This publication is related to an API licensing, certification, or accreditation program.
RP 5A5/ISO 15463:2003
Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe
(includes Errata 1 dated December 2009)
Specifies requirements and gives recommendations for field inspection and testing of oil country tubular goods. This document 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 oil country tubular goods (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 15463:2003. Pages: 118
7th Edition | June 2005 | Reaffirmed: August 2010
Product Number: GX5A507 | Price: $157.00

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
2-Year Extension: June 2013 | Product Number: G5B015 | Price: $118.00

Spec 5B *
Specification for Threading, Gauging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads—Chinese
Chinese translation of Spec 5B.
15th Edition | April 2008 | Product Number: G05B15C | Price: $83.00

Spec 5B *◆
Specification for Threading, Gauging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads—Kazakh
Kazakh translation of Spec 5B.
15th Edition | April 2008 | Product Number: G05B15K | Price: $95.00

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 Spec 5CT, Spec 5DP, and Spec 5L. Also covers gauge specifications and certification for casing, tubing, and line pipe gauges. Pages: 48
5th Edition | August 1999 | Reaffirmed: August 2010
Product Number: G5B105 | Price: $142.00

RP 5B1 ◆
Gauging and Inspection of Casing, Tubing and Line Pipe Threads—Kazakh
Kazakh translation of RP 5B1.
5th Edition | August 1999 | Product Number: G05B15K | Price: $114.00

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Operations in petrolem and natural gas industries for three product and C110, are contained in Annex H. This standard can also be applied to requirements for PSL-2 and PSL-3, for all Grades except H-40, L-80 9Cr, and establishes requirements for three product specification levels (PSL-1, PSL-2, and PSL-3).

This document covers the following grades of drill-pipe:

- Grade E drill-pipe and
- high-strength grades of drill-pipe, Grades X, G, and S.

This document can also be used for drill-pipe with tool joints not specified by ISO or API standards.

This edition of API Spec 5DP is the identical national adoption of ISO 11961:2008. Pages: 112

1st Edition | August 2009 | Effective Date: August 1, 2010
Product Number: GX5DP01 | Price: $181.00

Spec 5DP/ISO 11961:2008 *

This publication is related to an API licensing, certification, or accreditation program.

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 5LB
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 extra-end plain 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: August 2010
Product Number: G05L82 | Price: $125.00

RP 5LB *
Field Inspection of New Line Pipe—Kazakh
Kazakh translation of RP 5LB.
2nd Edition | December 1996
Product Number: G05L82K | Price: $100.00

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 thread 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 pipe. Pages: 35
1st Edition | December 2001 | Reaffirmed: August 2010
Product Number: G5L901 | Price: $79.00

Spec 5L9 *
Recommended Practice for External Fusion Bonded Epoxy Coating of Line Pipe—Kazakh
Kazakh translation of Spec 5L9.
1st Edition | December 2001 | Product Number: G5L901K | Price: $64.00

Spec 5L9 *
Recommended Practice for External Fusion Bonded Epoxy Coating of Line Pipe—Russian
Russian translation of Spec 5L9.
1st Edition | December 2001 | Product Number: G5L901R | Price: $64.00

Spec 5LC
Specification for CRA Line Pipe
Covers seamless, centrifugal cast, and welded corrosion resistant alloy line pipe as well as austenitic stainless, martensitic stainless, duplex stainless, and Ni base alloys. Also 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 testing. Metric units in this specification are shown in italic type in parentheses in the text and in many tables. Pages: 72
Reaffirmed: August 2006 | Product Number: G05LC3 | Price: $157.00

Spec 5LCP
Specification on Coiled Line Pipe
(includes Errata 1 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 | Reaffirmed: November 2012
Product Number: G5LCP2 | Price: $146.00

Spec 5LCP *
Specification on Coiled Line Pipe—Russian
Russian translation of Spec 5LCP.
2nd Edition | March 2009 | Product Number: G5LCP2R | Price: $103.00

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 Spec 5L, except as modified in the Spec 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: G5LDD3 | Price: $129.00

Spec 5LD *
CRA Clad or Lined Steel Pipe—Kazakh
Kazakh translation of Spec 5LD.
2nd Edition | March 2009 | Product Number: G5LDD3K | Price: $91.00

RP 5LT
Recommended Practice for Truck Transportation of Line Pipe
Applies to the transportation of coated or bare line pipe in sizes 2 3/8 in. (60.3 mm) and greater. Pages: 5
1st Edition | March 2012 | Product Number: G5LT01 | Price: $59.00

RP 5LW
Recommended Practice for Transportation of Line Pipe on Barges and Marine Vessels
Applies to the transportation of 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: $59.00
You may access RP 5LW in a read-only platform: publications.api.org

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 preproduction meeting, as appropriate, through the point of title transfer from suppliers to purchasers. Pages: 7
Product Number: G5S101 | Price: $57.00

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**Spec SST**

**Specification for Coiled Tubing—U.S. Customary and SI Units**

Covers the manufacturing, inspection, and testing of all carbon and low alloy steel coiled tubing in Grades CT70, CT80, CT90, CT100, and CT110, in the designations and wall thicknesses given in Table A.5, that can be used as work strings, completion strings, and static installations in oil and gas wells. Coiled tubing may be ordered to this specification. Coiled tubing is manufactured using the continuously milled process. This specification does not cover the joining of seamless or welded tubing segments in lengths less than 200 ft (61 m). Pages 68

1st Edition | April 2010 | Product Number: G5ST01 | Price: $134.00

**Spec SST**

**Specification for Coiled Tubing—U.S. Customary and SI Units—Chinese**

Chinese translation of Spec SST.

1st Edition | April 2010 | Product Number: G5ST01C | Price: $94.00

**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 that commonly occur in steel pipe. Pages: 44

Product Number: G05T10 | Price: $115.00

**TR 5TP**

**Torque-Position Assembly Guidelines for API Casing and Tubing Connections**

Provides alternative connection assembly procedures to those found in API 5B (power turns) and those found in API 5C1 (optimum torque). The procedures set forth are referred to as "torque-position" because the make-up torque and final position are used as acceptance criteria for the assembly operation. The connections are threaded in accordance with API 5B. The torque-position assembly parameters have been developed for most SC (short round thread casing), LC (long round thread casing), BC (buttress thread casing), and EU (external upset tubing) connections.

Torque-position is a precision assembly method that relies on a controlled process for successful implementation. When defined threading and assembly procedures are followed, the performance of the resulting assembled connection is optimized. Pages: 30

1st Edition | December 2013 | Product Number: G5TP01 | Price: $115.00

**TR STRSR22**

**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 Spec 5CT, Spec 5B, RP 5B1, and 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 Spec 5CT. Pages: 24

1st Edition | June 2002 | Product Number: GSR221 | Price: $88.00

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**RP 5UE**

**Recommended Practice for Ultrasonic Evaluation of Pipe Imperfections**

(includes Addendum 1 dated April 2009)

Describes procedures that 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;
- 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 | Reaffirmed: August 2010
Product Number: GSUE02 | Price: $79.00

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**VALVES AND WELLHEAD EQUIPMENT**

**Spec 6A/ISO 10423:2009**

**Specification for Wellhead and Christmas Tree Equipment**

(includes Errata 1 dated January 2011, Addendum 1 and Errata 2 dated November 2011, Addendum 2 dated November 2012, Addendum 3 dated March 2013, Errata 4 dated August 2013, and Errata 5 dated November 2013)

Specifies requirements and gives recommendations for the performance, dimensional and functional interchangeability, design, materials, testing, inspection, welding, marking, handling, storing, purchasing, repair, and remanufacture of wellhead and christmas tree equipment for use in the petroleum and natural gas industries. This specification does not apply to field use, field testing, or field repair of wellhead and christmas tree equipment.

This specification 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 specification defines service conditions, in terms of pressure, temperature, and material class for the well-bore constituents, and operating conditions. This document 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 10423:2009. Pages: 436

20th Edition | October 2010 | Effective Date: April 1, 2011
Product Number: GX06A20 | Price: $260.00
You may access Spec 6A in a read-only platform: publications.api.org

**Spec 6A/ISO 10423:2009**

**Specification for Wellhead and Christmas Tree Equipment—Chinese**

Chinese translation of Spec 6A.

20th Edition | October 2010
Product Number: GX06A20C | Price: $182.00

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†This publication is a new entry in this catalog.  †This publication is related to an API licensing, certification, or accreditation program.
The charts are intended to be used only as general guidelines for design.

- thermal stresses or elevated temperature effects were not considered.

- ASME Section VIII, Division 2 allowable stress categories for the flange were used to establish the maximum moment:

- 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

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 given in the April 1986 editions of Spec 6A and Spec 6AF. 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 following:

- 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

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

Evaluates the load carrying capacity of Spec 6A integral flanges, including the end tension and bending moment in addition to the conventional rated pressure and makeup forces. The effect of a temperature difference corresponding to 250 °F on the inside and 30 °F on the outside is also evaluated. Three-dimensional finite element meshes are generated for the Type 6B and Type 6BX flanges. The computer program SESAM is used to obtain the stresses at selected critical flange and hub sections and to determine the gasket reaction due to each of the four unit load cases and the temperature difference load case. The leakage criterion is defined as the load combination with reduces the initial makeup compressive forces in the gasket to zero. The stresses in each defined section are linearized in accordance with the ASME Section VIII, Division 2, procedure to determine the membrane and membrane-plus-bending stress intensities. The stress intensities are checked against the allowable conditions specified in Spec 6A. Pages: 119

TR 6AM
Technical Report on Material Toughness

Includes Charpy V-notch test toughness requirement that can be used as a quality assurance measure in Spec 6A equipment to screen materials with poor notch toughness. Pages: 12

Spec 6AV1
Specification for Validation of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service

Establishes design validation requirements for Spec 6A surface safety valves/underwater safety valves (SSV/USV) and associated valve bore sealing mechanism(s) for Class II and Class III. These classes are intended for use if substances such as sand can be expected to cause an SSV/USV valve failure. Class III adds requirements for the validation of the valve bonnet assembly inclusive of stem seals and may be selected by the user/purchaser. Validation to Class III also validates the same SSV/USV for Class II in accordance with scaling limitations specified in the document. The validation requirements in this specification are not represented as duplicating actual well conditions. NOTE Previous editions of this document included reference to and requirements for verification to PR1, standard service (Class I). Pages: 25

Spec 6D
Specification for Pipeline Valves

(includes Addendum 1 dated October 2009, Addendum 2 dated August 2011, Errata dated August 2011, and Addendum 3 dated October 2012)

Specifies requirements and provides recommendations for the design, manufacturing, testing, and documentation of ball, check, 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 (Spec 6DSS). This specification is not for application to valves for pressure ratings exceeding PN 420 (Class 2500).

This edition of API Spec 6D is the identical national adoption of ISO 14313:2007. Pages: 79

TR 6AF3
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 Bull 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

TR 6AF4
Technical Report on Temperature Derating of API Integral 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 Bull 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

TR 6AF5
Technical Report on Temperature Derating of API Integral 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 Bull 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
Specifications for Subsea Pipeline Valves

This edition of API Spec 6DSS is the identical national adoption of PN 420 (Class 2500).

This specification is not applicable to valves for pressure ratings exceeding those anticipated in this test. This standard covers the requirements for testing and evaluating the performance of Spec 6A and Spec 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 Spec 6A and Spec 6D valves when exposed to specifically defined fire conditions. However, this standard is not intended to cover check valves or end connections.

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 Spec 6A and Spec 6D valves when exposed to specifically defined fire conditions. However, this standard is not intended to cover check valves or end connections.

Specification for Subsea Pipeline Valves—Russian

Russian translation of Spec 6D.

This edition of API Spec 6DSS is the identical national adoption of ISO 14723:2009. Pages: 72

2nd Edition | December 2009 | Effective Date: June 1, 2010
Product Number: GX6DSS2 | Price: $165.00

Specification for Subsea Pipeline Valves—Chinese

Chinese translation of Spec 6DSS.

2nd Edition | December 2009
Product Number: GX6DSS2C | Price: $116.00

Standard for Actuator Sizing and Mounting Kits for Pipeline Valves

Defines the requirements for mechanical integrity and sizing of actuators used on valves manufactured under ISO 14313 and Spec 6D. This document is applicable to all types of electric, pneumatic, and hydraulic actuators, inclusive of mounting kit, installed on pipeline valves. This document is not applicable to actuators installed on control valves, valves being used for regulation, valves in sub-sea service, handheld powered devices, stand-alone manually operated gearboxes, instrument tubing and associated fittings, and actuator control equipment.

This edition of API Std 6DX is the identical national adoption of ISO 12490:2011. Pages: 51
1st Edition | October 2012 | Product Number: GG6DX01 | Price: $131.00

Fire Test for Valves—Russian

Russian translation of Spec 6FA.

3rd Edition | April 1999 | Product Number: G06FA3R | Price: $78.00

Fire Test for Valves—Chinese

Chinese translation of Spec 6FA.

3rd Edition | April 1999 | Product Number: G06FA3 | Price: $97.00

Fire Test According to API Specification 6FA

Establishes the requirements for testing and evaluating the pressure-containing performance of Spec 6A and Spec 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 Spec 6A and Spec 6D valves when exposed to specifically defined fire conditions. However, this standard is not intended to cover check valves or end connections.

Establishes 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 Bull 6F1. Further background on fire-resistance improvements of API flanges is contained in Bull 6F2. This specification covers 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.

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 Spec 6A and Spec 6D valves when exposed to specifically defined fire conditions. However, this standard is not intended to cover check valves or end connections.

Did not apply to valves for continued service in the owner's production system, or valves repaired or remanufactured per this document. Field repair is outside the scope of this document. Pages: 11
2nd Edition | May 2012 | Product Number: G06DR2 | Price: $78.00

Fire Test According to API Specification 6FA

Establishes the requirements for testing and evaluating the pressure-containing performance of Spec 6A and Spec 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 Spec 6A and Spec 6D valves when exposed to specifically defined fire conditions. However, this standard is not intended to cover check valves or end connections.

This edition of API Spec 6DSS is the identical national adoption of ISO 14723:2009. Pages: 72
2nd Edition | December 2009 | Effective Date: June 1, 2010
Product Number: GX6DSS2 | Price: $165.00

Specification for Subsea Pipeline Valves—Chinese

Chinese translation of Spec 6DSS.

2nd Edition | December 2009
Product Number: GX6DSS2C | Price: $116.00

Standard for Actuator Sizing and Mounting Kits for Pipeline Valves

Defines the requirements for mechanical integrity and sizing of actuators used on valves manufactured under ISO 14313 and Spec 6D. This document is applicable to all types of electric, pneumatic, and hydraulic actuators, inclusive of mounting kit, installed on pipeline valves. This document is not applicable to actuators installed on control valves, valves being used for regulation, valves in sub-sea service, handheld powered devices, stand-alone manually operated gearboxes, instrument tubing and associated fittings, and actuator control equipment.

This edition of API Std 6DX is the identical national adoption of ISO 12490:2011. Pages: 51
1st Edition | October 2012 | Product Number: GG6DX01 | Price: $131.00

Fire Test for Valves—Russian

Russian translation of Spec 6FA.

3rd Edition | April 1999 | Product Number: G06FA3R | Price: $78.00

Fire Test for Valves—Chinese

Chinese translation of Spec 6FA.

3rd Edition | April 1999 | Product Number: G06FA3 | Price: $97.00

Fire Test According to API Specification 6FA

Establishes the requirements for testing and evaluating the pressure-containing performance of Spec 6A and Spec 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 Spec 6A and Spec 6D valves when exposed to specifically defined fire conditions. However, this standard is not intended to cover check valves or end connections.


Summarizes the results of four projects to test the performance of API and ANSI end connections in a fire test according to Spec 6FA. The appendices present the analytical procedures used to generate performance predictions.

3rd Edition | April 1999 | Product Number: G06F13 | Price: $115.00

Recommended Practice for the 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 6D. This recommended practice covers repair or remanufacturing of end user's (owner's) valves for continued service in the owner's production applications. It does not cover repair or remanufacture of used or surplus valves intended for resale. Repaired or remanufactured valves may not meet API 6D and/or the original equipment manufacturer's original product definition for new valves. The owner is responsible for the correct application of valves repaired or remanufactured per this document. Field repair is outside the scope of this document. Pages: 11
2nd Edition | May 2012 | Product Number: G06DR2 | Price: $78.00

Specification for Subsea Pipeline Valves—Chinese

Chinese translation of Spec 6DSS.

2nd Edition | December 2009
Product Number: GX6DSS2C | Price: $116.00

Specification for Subsea Pipeline Valves—Russian

Russian translation of Spec 6D.

2nd Edition | December 2009
Product Number: GX6DSS2C | Price: $116.00

This edition of API Spec 6DSS is the identical national adoption of ISO 14723:2009. Pages: 72
2nd Edition | December 2009 | Effective Date: June 1, 2010
Product Number: GX6DSS2 | Price: $165.00

Specification for Subsea Pipeline Valves—Chinese

Chinese translation of Spec 6DSS.

2nd Edition | December 2009
Product Number: GX6DSS2C | Price: $116.00

This publication is a new entry in this catalog.

This publication is related to an API licensing, certification, or accreditation program.
Spec 6FC
Specification for Fire Test for Valves with Automatic Backseats

Establishes the requirements for testing and evaluating the pressure-containing performance of Spec 6A and Spec 6D automatic backseating valves 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, 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: $97.00

Spec 6FC *
Specification for Fire Test for Valves with Automatic Backseats—Russian

Russian translation of Spec 6FC.

Russian

4th Edition | March 2009 | Product Number: G06FC3R | Price: $78.00

Spec 6FD
Specification for Fire Test for Check Valves

Establishes the requirements for testing and evaluating the pressure-containing performance of Spec 6A and Spec 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

Product Number: G06FD1 | Price: $89.00

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

Russian translation of Spec 6FD.

Russian

1st Edition | February 1995 | Product Number: G06FD1R | Price: $72.00

RP 6HT
Heat Treatment and Testing of Carbon and Low Alloy Steel Large Cross Section and Critical Section Components

Supplements the heat treatment and testing requirements found in the API 6A equipment specification and is not intended to replace them altogether. Heat treatment is a critical process that must be appropriate and controlled in order to produce parts that comply with design requirements. The specified mechanical properties may not necessarily be required or achieved through the entire section thickness of the production part(s). These procedures are intended to provide the manufacturer and end user with a means of ensuring that the qualification test coupon (QTC) is more representative of the mechanical properties in a large cross-section component than can be expected with a standard API equipment specification QTC. Furthermore, these procedures are intended to provide to optimize the heat treatment and heat treatment response of large cross-section components, thereby insuring that the component has the required mechanical properties at the depth below the surface established by the manufacturer at all critical locations. The recommended practice described herein suggests the requirements for batch-type bath quench and water spray quench-type heat treating practices. Pages: 9

2nd Edition | June 2013 | Product Number: G6HT02 | Price: $85.00

Online Orders: www.global.ihs.com

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

Contains 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

1st Edition | February 1992 | Product Number: G03320 | Price: $79.00

TR 6J1
Elastomer Life Estimation Testing Procedures

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 Bull 6J, 2nd Edition. Pages: 14

1st Edition | August 2000 | Product Number: G06J11 | Price: $79.00

TR 6MET
Metallic Material Limits for Wellhead Equipment Used in High Temperature for API 6A and 17D Applications

Examines mechanical properties of metallic materials used for Spec 6A and Spec 17D wellhead equipment for service above 250 ºF. A total of eleven different alloys meeting Spec 6A, PSL 3 conditions were supplied “in condition” by a variety of suppliers. Materials in this test program included alloys common to the oil and gas industry. The alloys tested included low alloy steels, martensitic, precipitation hardened and duplex stainless steels, and nickel alloys. Yield strength reduction ratios at temperatures of 300 ºF, 350 ºF, 400 ºF, and 450 ºF are reported. As a result of testing, yield strength reduction ratios at 300 ºF to 450 ºF ranged from 92 % to 87 % for the low alloy steels, 92 % to 88 % for the martensitic stainless steels, 81 % to 73 % for super duplex, 99 % to 89 % for the precipitation hardened stainless steel, and 94 % to 89 % for the nickel alloys. The reported results represent an average over the different heats for each type of material. These results are intended to expand the data shown in Spec 6A, Appendix G. Pages: 32

1st Edition | October 2010 | Product Number: G06MET1 | Price: $98.00

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

Provides guidance for inspecting, installing, operating, maintaining, and onsite repairing SSVs/USVs manufactured according to Spec 6A (17th Edition or later), section 10.20 or Spec 14D (withdrawn). Included are procedures for testing SSVs/USVs. This document covers guidelines for inspections, 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

Product Number: G14H05 | Price: $119.00
You may access RP 14H in a read-only platform: publications.api.org

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

Russian translation of RP 14H.

Russian

5th Edition | August 2007 | Product Number: G14H05R | Price: $96.00

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Rotary shouldered connections and gauging for drill stem elements are:

- drill collars,
- drill-stem subs,
- square and hexagon kellys,
- upper and lower kelly valves,
- full hole 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 10424-2:2007. Spec 7-2 replaces threading and gauging previously covered by Spec 7-2. Pages: 102

1st Edition | February 2008 | Effective Date: December 1, 2008
Reaffirmed: October 2010 | Under Revision
Product Number: G07G6A | Price: $194.00

RP 7G *
Recommended Practice for Drill Stem Design and Operating Limits—Kazakh
Kazakh translation of RP 7G.
16th Edition | August 1998 | Product Number: G07G6AK | Price: $156.00

Recommended Practice for Drill Stem Element Inspection
(Includes Errata 1 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 10407-2:2008. Pages: 213
1st Edition | August 2009 | Product Number: GX7G021 | Price: $140.00

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RP 7G-2/ISO 10407-2:2008 *
Recommended Practice for Drill Stem Element Inspection—Spanish
Recommended Practice for Drill Stem Element Inspection (includes Addendum 1 dated February 2006 and Addendum 2 dated March 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 API RP 8B is the modified national adoption of ISO 13534:2000. Pages: 13
Product Number: G07K05C | Price: $83.00

Spec 7K *
Drilling and Well Servicing Equipment—Chinese
Chinese translation of Spec 7K.
5th Edition | June 2010 | Product Number: G07K05C | Price: $128.00

Spec 7NRV *
Specification on Non-Return Valves—Chinese
Chinese translation of Spec 7NRV.
1st Edition | July 2006 | Product Number: G7NRV01C | Price: $49.00

HOISTING TOOLS
RP 8B/ISO 13534:2000
Inspection, Maintenance, Repair, and Remanufacture of Hoisting Equipment
Provides the minimum acceptable requirements for drill string non-return valve (NRV) equipment. It covers drill string NRVs, NRV subs, NRV landing nipples, NRV equalizing heads, and all components that establish tolerances and/or clearances that may affect performance or interchangeability of the NRV equipment. NRVs manufactured by different facilities or manufacturers may be supplied as separate items. Pages: 19
Product Number: G7L01 | Price: $109.00

Spec 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
Reaffirmed: August 2012 | Product Number: G07L01 | Price: $109.00

Spec 7K *
Drilling and Well Servicing Equipment
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 specification. This specification is applicable to the following equipment:
- rotary tables;
- rotary bushings;
- standard rotary slips designed for use in standard rotary bowls with a 33.333 cm/m (4 in./ft) API taper;
- nonstandard rotary slips without a taper of 33.333 cm/m (4 in./ft) for use in manual spiders;
- high-pressure mud and cement hoses;
- piston mud-pump components;
- drawworks components;
- manual spiders that use standard rotary slips that are not capable for use as elevators and are installed on or above the master bushing/rotary table;
- manual spiders that use nonstandard rotary slips not having a taper of 33.333 cm/m (4 in./ft) not capable of use as elevators, and installed on or above the master bushing/rotary table;
- spring, pneumatic, or hydraulic spiders with integral slips not capable for use as elevators and are installed on or above the master bushing/rotary table;
- spring, pneumatic or hydraulic spiders with integral slips not capable for use as elevators and are installed in, or partly in, the rotary table;
- manual tongs;
- safety clamps not used as hoisting devices;
- power tongs, including spinning wrenches;
- blowout preventer handling systems;
- pressure-relieving devices for high-pressure drilling fluid circulating systems; and
- snub-lines for manual and power tongs. Pages: 105
5th Edition | June 2010 | Effective Date: December 1, 2010
Product Number: G07K05 | Price: $182.00
specifications are given. Pages: 57

26th Edition | May 2011 | Effective Date: November 1, 2011
Product Number: G9A026 | Price: $109.00
You may access Spec 9A in a read-only platform: publications.api.org

Spec 9A *
Specification for Wire Rope—Chinese
Chinese translation of Spec 9A.
26th Edition | May 2011 | Product Number: G9A026C | Price: $77.00

RP 9B
Application, Care, and Use of Wire Rope for Oil Field Service
(includes Errata 1 dated April 2012 and Errata 2 dated January 2013)
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: 32

OIL WELL CEMENTS

Spec 10A/ISO 10426-1:2009 *
Specification for Cements and Materials for Well Cementing
Specifies requirements and gives recommendations for six classes of well cements, including their chemical and physical requirements and procedures for physical testing.
Applicable to well cement classes A, B, C, and D, which are the products obtained by grinding Portland cement clinker and, if needed, calcium sulfate as an interground additive. Processing additives can be used in the manufacture of cement of these classes. Suitable set-modifying agents can be interground or blended during manufacture of class D cement.
Also applicable to well cement classes G and H, which are the products obtained by grinding clinker with no additives other than one or more forms of calcium sulfate, water or chemical additives as required for chromium (VI) reduction.
This edition of API Spec 10A is the identical national adoption of ISO 10426-1:2009 (includes ISO errata). Pages: 38
24th Edition | December 2010 | Effective Date: June 1, 2011
Product Number: GX10A24 | Price: $145.00

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Recommended Practice for Testing Well Cements

Provides procedures for testing cements and cement components. This recommended practice specifies procedures for testing and evaluation of the performance of cements used for repair of primary cementations of casing strings in oil and gas wells. Cement equipment performance in non-water-based fluids is also considered. Pages: 13

1st Edition | July 2004 | Reaffirmed: November 2010
Product Number: GX10B31 | Price: $77.00

Recommended Practice on Preparation and Testing of Foamed Cement Formulations

Provides the methods for the generation and testing of foamed cement slurries and their corresponding unfoamed base cement slurries at atmospheric pressure. 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 in non-water-based fluids. Pages: 12

1st Edition | August 2004 | Reaffirmed: July 2010
Product Number: GX10B41 | Price: $77.00

Recommended Practice on 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. Pages: 13

1st Edition | April 2005 | Reaffirmed: November 2010
Product Number: GX10B501 | Price: $80.00

Recommended Practice on Determining the Static Gel Strength of Cement Formulations

Provides the methods for determining the static gel strength of the cement slurries and related materials under simulated well conditions. Pages: 7


Spec 10D/ISO 10427-1:2001◆
Specification for Bow-Spring Casing Centralizers

Provides minimum performance requirements, test procedures and marking requirements for bow-spring casing centralizers for the petroleum and natural gas industries. This recommended practice is applicable to rigid or positive centralizers. Pages: 12

6th Edition | March 2002 | Effective Date: September 1, 2002
Reaffirmed: August 2010 | Product Number: GX10D06 | Price: $89.00

Recommended Practice for Performance Testing of Cementing Float Equipment

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. Pages: 14

1st Edition | August 2004 | Reaffirmed: July 2010
Product Number: GG10D21 | Price: $77.00

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: $145.00

Cement Sheath Evaluation—Kazakh

Kazakh translation of TR 10TR1. Pages: 124

2nd Edition | September 2008
Product Number: G10TR12K | Price: $116.00

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Cementing Shallow Water Flow Zones in Deepwater Wells—Kazakh
Kazakh translation of RP 65.
1st Edition | September 2002 | Product Number: G56001K | Price: $97.00

Isolating Potential Flow Zones During Well Construction
Contains best practices for zone isolation in wells to prevent annular pressure and/or flow through or past pressure-containment barriers that are installed and verified during well construction. Well construction practices that may affect barrier sealing performance are mentioned along with methods to help ensure positive effects or to minimize any negative ones. The objectives of this guideline are two-fold. The first is to help prevent and/or control flows just prior to, during, and after primary cementing operations to install or “set” casing and liner pipe strings in wells. The second objective is to help prevent sustained casing pressure. The guidance from this document covers recommendations for pressure-containment barrier design and installation and well construction practices that affect the zone isolation process to prevent or mitigate annular fluid flow or pressure. Pages: 83
2nd Edition | December 2010 | Product Number: G65202 | Price: $130.00
You may access Std 65-2 in a read-only platform: publications.api.org

**PRODUCTION EQUIPMENT**

RP 11AR
Recommended Practice for Care and Use of Subsurface Pumps (includes Errata dated December 2013)
Provides information on the proper selection, operation, and maintenance of subsurface pumps so the best economical life can be obtained. Pages: 50
Product Number: G11AR4 | Price: $124.00

Spec 11AX
Specification for Subsurface Sucker Rod Pumps and Fittings (includes Addendum 1 dated August 2011 and Addendum 2 dated October 2012)
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
Reaffirmed: January 2012 | Product Number: G11AX12 | Price: $134.00

Spec 11AX *
Specification for Subsurface Sucker Rod Pumps and Fittings—Chinese
Chinese translation of Spec 11AX.

Spec 11B
Specification for Sucker Rods, Polished Rods and Liners, Couplings, Sinker Bars, Polished Rod Clamps, Stuffing Boxes, and Pumping Tees (includes Errata 2 dated February 2011)
Provides the requirements and guidelines for the design of steel sucker rods and pony rods, polished rods, polished rod liners, couplings and sub-couplings, fiber reinforced plastic sucker rods, sinker bars, polished rod clamps, stuffing boxes, and pumping tees as defined herein for use in the sucker rod lift method for the petroleum and natural gas industry. Annex A through Annex H provide the requirements for specific products. Annex I

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includes the requirements for thread gauges, Annex I illustrates the components of a sucker rod lift system, and Annex K shows examples of sucker rod discontinuities.

This specification does not cover sucker rod guides, sucker rod rotators, shear tools, on-off tools, stabilizer bars, sealing elements used in stuffing boxes, or interface connections for stuffing boxes and pumping tees. Also, installation, operation, and maintenance of these products are not included in this specification. Pages: 91

27th Edition | May 2010 | Effective Date: November 1, 2010
Product Number: G11B27 | Price: $155.00

Spec 11B *
Specification for Sucker Rods, Polished Rods and Liners, Couplings, Sinker Bars, Polished Rod Clamps, Stuffing Boxes, and Pumping Tees—Chinese

Chinese translation of Spec 11B.


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

Product Number: G11BR09 | Price: $105.00

Std 11D2/ISO 15136-1:2009
Progressing Cavity Pump Systems for Artificial Lift—Pumps

Provides requirements for the design, design verification and validation, manufacturing and data control, performance ratings, functional evaluation, repair, handling, and storage of progressing cavity pumps for use in the petroleum and natural gas industry. This document is applicable to those products meeting the definition of progressing cavity pumps (PCP) included therein.

Connections to the drive string and tubulars are not covered by the document. Additionally, equipment not covered by the requirements of this document includes bottom-drive systems except for the PCP components, drive-string components, and auxiliary equipment such as tag bars, gas separators, and torque anchors.

This edition of API Std 11D2 is the identical national adoption of ISO 15136-1:2009. Pages: 108
1st Edition | October 2010 | Product Number: GG11D21 | Price: $155.00

Progressing Cavity Pump Systems for Artificial Lift—Surface-Drive Systems

Provides requirements for the design, design verification and validation, manufacturing and data control, performance ratings, repair and maintenance, and chemical properties of progressing cavity pump 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, and auxiliary equipment, such as belts, sheaves, and equipment guards.

This edition of API Std 11D3 is the identical national adoption of ISO 15136-2:2006. Pages: 99
1st Edition | June 2008 | Product Number: G11D301 | Price: $106.00

Spec 11E
Specification for Pumping Units

Provides the requirements and guidelines for the design and rating of beam pumping systems 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, the pumping unit gear reducer, and the 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 rating methods and influences identified in this specification are limited to single and multiple stage designs applied to beam pumping units in which the pitch-line velocity of any stage does not exceed 5,000 ft/min and the speed of any shaft does not exceed 3,600 r/min. This standard 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: 104
19th Edition | November 2013 | Effective Date: May 8, 2014
Product Number: G11E019 | Price: $170.00

Spec 11E *
Specification for Pumping Units—Chinese

Chinese translation of Spec 11E.

19th Edition | November 2013
Product Number: G11E018C | Price: $119.00

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 that have 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
3rd Edition | November 2009 | Product Number: G11ER03 | Price: $80.00

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

Provides guidance related to the proper installation, care, and maintenance of surface mounted beam pumping units, varieties of which are described in Spec 11E. Information provided in this document is of a general nature and is not intended to replace specific instruction provided by the pumping unit manufacturer. This document further establishes certain minimum requirements intended to promote the safe installation, operation, and servicing of pumping unit equipment. Pages: 26
5th Edition | November 2013 | Product Number: G11G05 | Price: $85.00

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 normal, pump wearing well conditions 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: $106.00

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Bull 11L2
Catalog of Analog Computer Dynamometer Cards
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: $122.00

Bull 11L3
Sucker Rod Pumping System Design Book
(includes Errata 1 dated November 1973 and Supplement 1 dated February 1977)
Contains print-out tables of computer calculated values for selecting sucker rod systems. Values are included for depths of 200 ft to 12,000 ft in increments of 500 ft and production rates of 100 barrels per day to over 1500 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: $132.00

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 severe duty application, including blowing dust or snow, corrosive atmospheres, high humidity, and cyclic loading. Pages: 13
2nd Edition | May 2008 | Product Number: G11L602 | Price: $86.00

TR 11L6 *
Technical Report on Electric Motor Prime Mover for Beam Pumping Unit Service—Chinese
2nd Edition | May 2008 | Product Number: G11L602C | Price: $61.00

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
Product Number: G11S03 | Price: $83.00

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 that 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
Reaffirmed: October 2013 | Product Number: G11S13 | Price: $122.00

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This publication is related to an API licensing, certification, or accreditation program.

**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. Pages: 27

Product Number: G11S61 | Price: $89.00

**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. This 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 selection and application. Pages: 28

Product Number: G05947 | Price: $89.00

**RP 11S8**
Recommended Practice on Electric Submersible System Vibrations

Provides guidelines to establish consistency in the control and analysis of electric submersible pump (ESP) system vibrations. This document is considered appropriate for the testing of ESP systems and subsystems for the majority of ESP applications. This recommended practice covers the vibration limits, testing, and analysis of ESP systems and subsystems. Pages: 18

2nd Edition | October 2012 | Product Number: G11S802 | Price: $78.00

**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 10,000 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: April 1, 2009
Product Number: G12B11 | Price: $97.00
You may access Spec 12B in a read-only platform: publications.api.org

**Spec 12D**
Specification for Field Welded Tanks for Storage of Production Liquids—Chinese

Chinese translation of Spec 12D.

11th Edition | October 2008 | Product Number: G12D11C | Price: $68.00

**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: April 1, 2009
Product Number: G12F12 | Price: $97.00
You may access Spec 12F in a read-only platform: publications.api.org

**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 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: $97.00

**Spec 12J**
Specification for Oil and Gas Separators—Chinese

Chinese translation of Spec 12J.

8th Edition | October 2008 | Product Number: G12J08C | Price: $68.00

**Spec 12J**
Specification for Oil and Gas Separators—Russian

Russian translation of Spec 12J.

8th Edition | October 2008 | Product Number: G12J08R | Price: $78.00

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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 at 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: G12K08B | Price: $115.00

Spec 12K *
Specification for Indirect Type Oilfield Heaters—Chinese
Chinese translation of Spec 12K.

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 heater 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 emissions 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: $97.00

RP 12R1
Recommended Practice for Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service
Should be considered as a guide on new tank installations and maintenance of existing tanks. It contains recommendations for good practices in the collection of well or lease production; gauging; delivery to pipeline carriers for transportation; and other production storage and treatment operations. This recommended practice is intended primarily for application to tanks fabricated to Spec 12F; Spec 12D, Spec 12F, and Spec 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
Product Number: G12R15 | Price: $132.00

DRILLING FLUID MATERIALS

Spec 13A/ISO 13500:2009 ◆
Specification for Drilling Fluid Materials
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-LV), high-viscosity carboxymethylcellulose (CMC-HVT), starch, low-viscosity polyanionic cellulose (PAC-LV), high-viscosity polyanionic cellulose (PAC-HV), drilling grade Xanthan gum, and base 41. 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 13500:2009. Pages: 109
18th Edition | February 2010 | Effective Date: August 1, 2010
Product Number: GX13A018 | Price: $181.00

Spec 13A/ISO 13500:2009 *
Specification for Drilling Fluid Materials—Chinese
Chinese translation of Spec 13A.
18th Edition | February 2010
Product Number: GX13A018C | Price: $181.00

RP 13B-1/ISO 10414-1:2008
Recommended Practice for Field Testing Water-Based Drilling 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;
- sand content;
- methylene blue capacity;
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• pH;
• alkalinity and lime content;
• chloride content; and
• total hardness as calcium.

Annex A through Annex K provide additional test methods.

This edition of API 13B-1 is the identical national adoption of ISO 10414-1:2008. Pages: 91

Product Number: GX13B14 | Price: $165.00

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 content, and sodium chloride content; and
• low-gravity solids and weighting material contents. Pages: 100

Under Revision, 2-Year Extension: June 2010
Product Number: G13B204 | Price: $163.00

RP 13C/ISO 13501
Recommended Practice on Drilling Fluid Processing Systems Evaluation

Provides a standard procedure for assessing and modifying performance of solids control equipment systems commonly used in the field in petroleum and natural gas drilling fluids processing.

This procedure is not intended for the comparison of similar types of individual pieces of equipment. This standard specifies a different labelling requirement for shale shaker screens that will be permanently attached to the screen. It also covers the marking of shipping containers for shale shaker screens. This standard provides a standard procedure for quick assessment of solids control screen sizing. The method can be used in the field or laboratory for identification of an unknown screen approximate size range.

This edition of API RP 13C is the modified national adoption of ISO 13501. Pages: 52


RP 13D
Rheology and Hydraulics of Oil-Well Fluids

Provides a basic understanding of and guidance about drilling fluid rheology and hydraulics and their application to drilling operations. For this recommended practice, rheology is the study of flow characteristics of a drilling fluid and how these characteristics affect movement of the fluid. Specific measurements are made on a fluid to determine rheological parameters under a variety of conditions. From this information the circulating system can be designed or evaluated regarding how it will accomplish certain desired objectives. Pages: 94

6th Edition | May 2010 | Product Number: G13D06 | Price: $134.00

RP 13D *
Rheology and Hydraulics of Oil-Well Fluids—Kazakh
Kazakh translation of RP 13D.


RP 13I/ISO 10416:2008
Recommended Practice for Laboratory Testing of Drilling Fluids

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. Pages: 108

Product Number: GX13I8 | Price: $186.00

RP 13J/ISO 13503-3:2005
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 RP 13J is the identical national adoption of ISO 13503-3:2005. Pages: 43

Product Number: G13J04 | Price: $124.00

RP 13K
Recommended Practice for Chemical Analysis of Barite

Barite is used to increase the density of oil well drilling fluids. It is a mined product that can contain significant quantities of minerals other than barium sulfate, which is its main component.

It is the objective of this publication to provide a comprehensive, detailed description of the chemical analytical procedures for quantitatively determining the mineral and chemical constituents of barite. These procedures are quite elaborate and will normally be carried out in a well-equipped laboratory. Pages: 51

3rd Edition | May 2011 | Product Number: G13K03 | Price: $107.00

RP 13K *
Recommended Practice for Chemical Analysis of Barite—Kazakh
Kazakh translation of RP 13K.

3rd Edition | May 2011 | Product Number: G13K03K | Price: $86.00

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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 recommended practice 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 recommended practice 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 recommended practice as a checklist of knowledge that a technologist should be able to demonstrate proficiency in applying. Pages: 7
1st Edition | February 2003 | Reaffirmed: October 2010
Product Number: G13L01 | Price: $53.00

RP 13M/ISO 13503-1:2003
Recommended Practice for the 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 13503-1:2003. Pages: 21
1st Edition | July 2004 | Reaffirmed: October 2010
Product Number: GX13M01 | Price: $98.00

Recommended Practice for Measuring Stimulation and Gravel-Pack 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 13503-4:2006. Pages: 14
1st Edition | December 2006 | Product Number: GG13M41 | Price: $57.00

OFFSHORE SAFETY AND ANTIPOLLUTION

Spec 14A/ISO 10432:2004 *
Specification for Subsurface Safety Valve Equipment—Russian

Provides the minimum acceptable requirements for subsurface safety valves (SSSVs). It covers subsurface safety valves including all components that establish tolerances and/or clearance that 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 10432:2004. Pages: 79
11th Edition | October 2005 | Effective Date: May 1, 2006
Reaffirmed: July 2012 | Product Number: GX14A11 | Price: $171.00
You may access Spec 14A in a read-only platform: publications.api.org

Spec 14A/ISO 10432:2004 *
Specification for Subsurface Safety Valve Equipment—Chinese

Chinese translation of Spec 14A.
11th Edition | October 2005
Product Number: GX14A11C | Price: $120.00

Spec 14A/ISO 10432:2004 *
Spec 14A/ISO 10432:2004 *
RP 14B/ISO 10417:2004
Design, Installation, Repair and Operation of Subsurface Safety Valve Systems

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 10417:2004. Pages: 31
Product Number: GX14B05 | Price: $115.00
You may access RP 14B in a read-only platform: publications.api.org

RP 14B/ISO 10417:2004 *
Design, Installation, Repair and Operation of Subsurface Safety Valve Systems—Russian

Russian translation of RP 14B.
5th Edition | October 2005 | Product Number: GX14B05R | Price: $92.00

RP 14C
Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for 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
2-Year Extension: December 2012
Product Number: G14C07 | Price: $201.00
You may access RP 14C in a read-only platform: publications.api.org

RP 14E
Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems

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
Product Number: G07185 | Price: $149.00
You may access RP 14E in a read-only platform: publications.api.org

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RP 14F
Design, Installation, and Maintenance 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 RP 4FZ. These facilities include drilling, producing, and pipeline transportation facilities associated with oil and gas exploration and production. This recommended practice is not applicable to mobile offshore drilling units 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

Product Number: G14F05 | Price: $119.00
You may access RP 14F in a read-only platform: publications.api.org

RP 14G
Recommended Practice for Fire Prevention and Control on Open-Type 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

You may access RP 14G in a read-only platform: publications.api.org

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

Provides guidance for inspecting, installing, operating, maintaining, and onsite repairing SSVs/USVs manufactured according to Spec 6A (17th Edition or later), section 10.20 or 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: $119.00
You may access RP 14H in a read-only platform: publications.api.org

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 RP 75. Pages: 75

Product Number: G14J02 | Price: $117.00
You may access RP 14J in a read-only platform: publications.api.org

Spec 14L/ISO 16070:2005 ♦
Specification for 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 Spec 14L is the identical national adoption of ISO 16070:2005. Pages: 25

Product Number: GG14L02 | Price: $119.00

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 installations 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: $61.00

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Specifications

**RP 15CLT**
**Recommended Practice for Composite Lined Steel Tubular Goods**

Provides guidelines for the design, manufacturing, qualification and application of composite lined steel downhole tubing in the handling and transport of multiphase fluids, hydrocarbon gases, hydrocarbon liquids and water. The principles outlined in this recommended practice 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 recommended practice 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

Product Number: G15CLT1 | Price: $83.00

**Spec 15HR**
**High Pressure Fiberglass Line Pipe**

(includes Addendum 1 dated November 2004, Errata 1 dated February 2007, and Errata 2 dated January 2008)

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 | Reaffirmed: October 2010
Product Number: G15HR3 | Price: $97.00

**Spec 15HR**
**High Pressure Fiberglass Line Pipe—Chinese**

Chinese translation of Spec 15HR.

3rd Edition | August 2001 | Product Number: G15HR3C | Price: $68.00

**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
Reaffirmed: October 2013 | Product Number: G15LE4 | Price: $101.00

**Spec 15LE**
**Polyethylene (PE) Line Pipe—Chinese**

Chinese translation of Spec 15LE.


**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 psi in cyclic operating pressures. In addition, at the manufacturer’s option, the pipe may also be rated for static operating pressures up to 1000 psi. It is recommended that the pipe and fittings be purchased by cyclic pressure rating. The standard pressure ranges 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: October 2013 | Product Number: G15LR7 | Price: $97.00

**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 or aramid fibers-reinforced thermoplastic pipe. They are continuous flowline systems capable of being reeled for storage, transport, and installation. For offshore use, additional requirements may apply. Pages: 26

Product Number: G15S01 | Price: $97.00

**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

Product Number: G15TL4 | Price: $97.00

**Spec 16A/ISO 13533:2001**
**Specification for Drill-Through Equipment**

(includes Supplement/Errata 1 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;

*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.*
Specification for Control Systems for Drilling Well Control 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; and
- special deepwater/harsh environment features. Pages: 97

Reaffirmed: August 2013 | Product Number: G16D02 | Price: $177.00

Spec 16D *
Specification for 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; and
- special deepwater/harsh environment features. Pages: 97

Reaffirmed: August 2013 | Product Number: G16D02 | Price: $177.00

Spec 16F ◆
Specification for Marine Drilling Riser Equipment

Establishes design, selection, operation and maintenance standards for marine drilling riser equipment. 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

Reaffirmed: August 2010 | Under Revision | Product Number: G16F01 | Price: $119.00

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

Reaffirmed: August 2010 | Under Revision | Product Number: G16F01 | Price: $119.00

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 RP 16Q, which covers the design, selection, and operation of the marine drilling riser system as a whole. Pages: 18

Reaffirmed: August 2010 | Under Revision | Product Number: G16R01 | Price: $97.00
Recommended Practice for Diverter Systems Equipment and Operations—Kazakh
Kazakh translation of RP 64.
2nd Edition | October 2001 | Product Number: G64002K | Price: $86.00

**SUBSEA PRODUCTION SYSTEMS**

**RP 17A/ISO 13628-1:2005**
Design and Operation of Subsea Production Systems—General Requirements and Recommendations
(includes Addendum 1 dated December 2010)
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 control fluids; templates and manifolds; and production risers (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 that 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 transfers 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 API RP 17A is the identical national adoption of ISO 13628-1:2005. Pages: 232
Product Number: GX17A04 | Price: $182.00

**RP 17B/ISO 13628-11:2007**
Recommended Practice for Flexible Pipe
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 recommended practice supplements Spec 17J and Spec 17K, which specify minimum requirements for the design, material selection, manufacture, testing, marking, and packaging of unbonded and bonded flexible pipe, respectively. This recommended practice 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 recommended practice applies to flexible pipe systems, including ancillary components. The applications covered by this recommended practice are sweet- and sour-service production, including export and injection applications. This recommended practice applies to both static and dynamic flexible pipe systems used as flowlines, risers, and jumpers. This recommended practice does cover, in general terms, the use of flexible pipes for offshore loading systems. This recommended practice does not cover flexible pipes for use in choke and kill lines or umbilical and control lines.
This edition of API RP 17B is the identical national adoption of ISO 13628-11:2007. Pages: 213
Product Number: GX17B04 | Price: $208.00

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This publication is a new entry in this catalog. This publication is related to an API licensing, certification, or accreditation program.
RP 17C/ISO 13628-3:2000
Recommended Practice on TFL (Through Flowline) Systems

Provides recommendations for designing, fabricating, and operating TFL 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 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 API RP 17C is the identical national adoption of ISO 13628-3:2000. Pages: 67

Product Number: GX17C02 | Price: $125.00

Spec 17D
Specification for Subsea Wellhead and Christmas Tree Equipment

(includes Errata 1 dated September 2011, Errata 2 dated January 2012, Errata 3 dated June 2013, Errata 4 dated July 2013, and Errata 5 dated October 2013)

Provides specifications for subsea wellheads, mudline wellheads, drill-through mudline wellheads, and both vertical and horizontal subsea trees. It specifies the associated tooling necessary to handle, test, and install the equipment. It also specifies the areas of design, material, welding, quality control (including factory acceptance testing), marking, storage, and shipping for both individual sub-assemblies (used to build complete subsea tree assemblies) and complete subsea tree assemblies. The user is responsible for ensuring subsea equipment meets any additional requirements of governmental regulations for the country in which it is installed. This is outside the scope of this document. Where applicable, this document can also be used for equipment on satellite, cluster arrangements, and multiple well template applications. This document includes equipment definitions, an explanation of equipment use and function, an explanation of service conditions and product specification levels, and a description of critical components. This document is not applicable to the rework and repair of used equipment. Pages: 254

2nd Edition | May 2011 | Effective Date: November 1, 2011
Product Number: GX17D02 | Price: $186.00

Spec 17D
Specification for Subsea Wellhead and Christmas Tree Equipment—Chinese

Chinese translation of Spec 17D.

2nd Edition | May 2011 | Product Number: GX17D02C | Price: $131.00

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 fibers, 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: 167

4th Edition | October 2010 | Effective Date: April 1, 2011
Product Number: GX17E04 | Price: $194.00

Spec 17F/ISO 13628-6:2006
Specification for Subsea Production Control Systems

Applicable to design, fabrication, testing, installation, and operation of subsea production control systems. Spec 17F covers surface control system equipment, subsea-installed control system equipment, and control fluids. This document can also be used for equipment on satellite, cluster arrangements, and multiple well template applications. This document includes equipment definitions, an explanation of equipment use and function, an explanation of service conditions and product specification levels, and a description of critical components. This document is not applicable to the rework and repair of used equipment. Pages: 254

2nd Edition | June 2013 | Product Number: G17H02 | Price: $160.00

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Exploration and Production

Specification for Unbonded Flexible Pipe (includes Errata 1 dated February 2009 and Errata 2 dated August 2010)

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 RP 17B for guidelines on the use of flexible pipes and ancillary components. This specification applies to unbonded flexible pipe assemblies, consisting of segments of flexible pipe body with end fittings attached to both ends. This specification does not cover flexible pipes of bonded structure. This specification does not apply to flexible pipe ancillary components. Guidelines for bend stiffeners and bend restrictors are given in Annex B. This specification 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 specification applies to both static and dynamic flexible pipes used as flowlines, risers, and jumpers. This specification does not apply to flexible pipes for use in choke-and-kill line applications.

This edition of API Spec 17J is the identical national adoption of ISO 13628-2:2006. Pages: 73

3rd Edition | July 2008 | Effective Date: January 1, 2009
2-Year Extension: December 2013
Product Number: GX17J03 | Price: $128.00
You may access Spec 17J in a read-only platform: publications.api.org

Spec 17K/ISO 13628-10:2005
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 nonmetallic reinforcing layers, though no effort was made to address the specific and unique technological aspects of this product.

This edition of API Spec 17K is the identical national adoption of ISO 13628-10:2005. Pages: 74

2nd Edition | November 2005 | Effective Date: May 1, 2006
Reaffirmed: May 2010 | Product Number: GX17K02 | Price: $151.00

Spec 17L/ISO 13628-1:2005
Specification for Flexible Pipe Ancillary Equipment

Defines the technical requirements for safe, dimensionally and functionally interchangeable flexible pipe ancillary equipment that is designed and manufactured to uniform standards and criteria. Minimum requirements are specified for the design, material selection, manufacture, testing, marking, and packaging of flexible pipe ancillary equipment, with reference to existing codes and standards where applicable. The applicability relating to a specific item of ancillary equipment is stated at the beginning of the particular clause for the ancillary equipment in question. This document applies to the following flexible pipe ancillary equipment: bend stiffeners; bend restrictors; bellmouths; buoyancy modules and ballast modules; subsea buoys; tethers for subsea buoys and tether clamps; riser and tether bases; clamping devices; piggy-back clamps; repair clamps; I/J-tube seals; pull-in heads/installation aids; connectors; load-transfer devices; mechanical protection; and fire protection. This document may be used for bonded flexible pipe ancillary equipment, though any requirements specific to these applications are not addressed. Where relevant, the applicability of recommendations to umbilicals is indicated in the Applicability subclause for the ancillary equipment in question. This document does not cover flexible pipe ancillary equipment beyond the connector, with the exception of riser bases and load-transfer devices. Therefore, this document does not cover turret structures or I-tubes and J-tubes, for example. In addition, it does not cover flexible pipe storage devices, for example reels. This recommended practice is intended to cover ancillary equipment made from several material types, including metallic, polymer, and composite materials. It may also refer to material types for particular ancillary components that are not commonly used for such components currently but may be adopted in the future. Pages: 275

1st Edition | March 2013 | Product Number: G17L01 | Price: $170.00

RP 17N
Recommended Practice for Flexible Pipe Ancillary Equipment

Provides guidelines for the design, materials selection, analysis, testing, manufacture, handling, transportation, installation, and integrity management of flexible pipe ancillary equipment. It presents the current best practice for design and procurement of ancillary equipment, and it gives guidance on the implementation of the specification for standard flexible pipe products. In addition, this document presents guidelines on the qualification of prototype products. The applicability relating to a specific item of ancillary equipment within this recommended practice is stated at the beginning of the clause dedicated to that item of ancillary equipment. This document applies to the following flexible pipe ancillary equipment: bend stiffeners; bend restrictors; bellmouths; buoyancy modules and ballast modules; subsea buoys; tethers for subsea buoys and tether clamps; riser and tether bases; clamping devices; piggy-back clamps; repair clamps; I/J-tube seals; pull-in heads/installation aids; connectors; load-transfer devices; mechanical protection; and fire protection. This document may be used for bonded flexible pipe ancillary equipment, though any requirements specific to these applications are not addressed. Where relevant, the applicability of recommendations to umbilicals is indicated in the Applicability subclause for the ancillary equipment in question. This document does not cover flexible pipe ancillary equipment beyond the connector, with the exception of riser bases and load-transfer devices. Therefore, this document does not cover turret structures or I-tubes and J-tubes, for example. In addition, it does not cover flexible pipe storage devices, for example reels. This recommended practice is intended to cover ancillary equipment made from several material types, including metallic, polymer, and composite materials. It may also refer to material types for particular ancillary components that are not commonly used for such components currently but may be adopted in the future. Pages: 99

1st Edition | March 2009 | Product Number: G17N01 | Price: $173.00
RP 170
Recommended Practice for High Integrity Pressure Protection Systems (HIPPS)

Addresses the requirements for the use of HIPPS for subsea applications. RP 14C, IEC 61508, and IEC 61511 specify the requirements for onshore, topsides, and subsea safety instrumented systems (SIS) and are applicable to HIPPS, which are designed to autonomously isolate downstream facilities from overpressure situations. This document integrates these requirements to address the specific needs of subsea production. These requirements cover the HIPPS pressure sensors, logic solver, shutdown valves, and ancillary devices including testing, communications, and monitoring subsystems. Pages: 38

1st Edition | October 2009 | Product Number: G17O01 | Price: $109.00

RP 17P/ISO 13628-1:2005
Design and Operation of Subsea Production Systems—Subsea Structures and Manifolds

Addresses specific requirements and recommendations for subsea structures and manifolds, within the frameworks set forth by recognized and accepted industry specifications and standards. As such, it does not supersede or eliminate any requirement imposed by any other industry specification. This recommended practice covers subsea manifolds and templates utilized for pressure control in both subsea production of oil and gas, and subsea injection services. Equipment within the scope of this recommended practice is listed as follows: production and injection manifolds; modular and integrated single satellite and multowell templates; subsea processing and subsea boosting stations; flowline riser bases and export riser bases; pipeline end manifolds; pipe-line end terminations; T- and Y-connections; subsea isolation valve structures; subsea controls and distribution structures; and associated protection structures. Pages: 69

1st Edition | January 2013 | Product Number: GG17P01 | Price: $150.00

RP 17Q
Recommended Practice for Subsea Equipment Qualification—Standardized Process for Documentation

Provides guidance on relevant qualification methods that may be applied to facilitate subsea project execution. Qualification of subsea equipment is based on a breakdown of individual subsea components and categorization of those individual components based on classes of equipment and component functionality. A comprehensive component-level breakdown can cater to wide flexibility for field-specific configurations. The qualification process presented in this recommended practice is governed by component-level evaluation and referencing using two separate forms of documentation: failure mode assessments (FMAs) and product qualification sheets (PQSs). Detailed documentation resources related to the proactive qualification methodology presented in this recommended practice are provided in the annexes. The templates in Annex B (FMA Templates) and Annex C (PQS Templates) may be purchased separately in a Microsoft® Excel format for $59.00—Single User, or $308.00—Intranet Licensing. Pages: 65

1st Edition | June 2010 | Product Number: G17Q01 | Price: $134.00

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: $132.00

TR 17TR2
The Ageing of PA-11 in Flexible 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 age and associated loss of mechanical properties, by determining and disseminating the necessary scientific and practical information. Pages: 31


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 annull other than the production tubing (commonly referred to as the "A" annulus) could be monitored. Current industry standards (Spec 17D and ISO 13628-4) for the design of subsea wellheads prohibit penetrations below the BOP stack. In contrast, U.S. 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. 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: $132.00

TR 17TR4
Subsea Equipment Pressure Ratings

The impact of operation in deep water on the pressure rating of equipment is a special concern. The objective of this document is to foster a better understanding of the effects of simultaneous internal and external pressures on the rated working pressure of equipment covered by the scope of Spec 17D. Additionally, it seeks to provide a high-level overview of issues that should be considered if a user elects to consider differential pressure in their design, especially in components with irregular geometry and with high stress concentrations. It is not intended to serve as a design specification. Pages: 6

1st Edition | January 2012 | Product Number: G17TR41 | Price: $65.00

TR 17TR5
Avoidance of Blockages in Subsea Production Control and Chemical Injection Systems

Addresses the avoidance of blockages in subsea production control and chemical injection systems. It includes requirements and gives recommendations for the design and operation of subsea production systems (SPSs) with the aim of preventing blockages in control and production chemical fluid conduits and associated connectors/fittings. In the context of design, this covers not only installed subsea hardware (trees, manifolds, etc.) and the connecting linkages (jumper arrangements, umbilical systems, etc.) but also the fluids to be conveyed, initially from the fluid manufacturers’ facilities through to bunkering at the host facility and, ultimately, injection or usage at remote subsea locations.
The guidelines set out the framework within which more detailed specifications and procedures should be developed to address the particular features of specific projects and specific installations in respect of design through to production operations and, ultimately, decommissioning. They also indicate what needs to be taken into account and approaches that can be considered, or may be taken, in order that blockages do not occur during the installation, commissioning, and operations of a SPS.

While the aim of this document is to prevent blockages in a SPS, it also addresses the issues of topside equipment that provides the control and chemical injection services necessary for the operation and performance of a SPS. Pages: 44

1st Edition | March 2012 | Product Number: G17TR501 | Price: $98.00

TR 17TR6
Attributes of Production Chemicals in Subsea Production Systems
identifies and specifies the essential attributes of production chemicals intended to be introduced to subsea oil and gas production systems. This document is intended for use by chemical suppliers to facilitate the provision of chemicals compatible with existing and intended subsea production systems (SPS) although it is envisaged that use of the document for specification purposes by the operators of such processes will assist in ensuring the completeness of requests to supply. The application of the document requires acceptance of the principle that it is the supplier's responsibility to ensure that the chemicals supplied are fit for purpose and safe to use, although it is acknowledged that this responsibility can only be fulfilled if specification of requirements is complete. To this end the document identifies essential information that only SPS designers and operators can provide but without knowledge of which, suppliers should not supply. In the requirements of this document, responsibility for obtaining these items of critical information is placed upon the supplier, in the expectation that designers and operators will respond with their ready provision.

The functional performance of production chemicals is outside the scope of this document. The assessments and tests specified in this document are not intended to qualify materials for use in an SPS in respect of pressure containment, mechanical load, cyclic mechanical load, or other design parameters. The chemical-chemical compatibility of production chemicals at their respective application concentrations is also outside the scope of this document as is the effect of any incompatibility on their respective functional performance. Finally, this document does not consider the health, safety, or environmental implications of deploying a production chemical in an SPS. Pages: 42

1st Edition | March 2012 | Product Number: G17TR601 | Price: $98.00

COMPLETION EQUIPMENT
Spec 11D1/ISO 14310:2008
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 national adoption of ISO 14310:2008. Pages: 30

2nd Edition | July 2009 | Effective Date: January 1, 2010
Product Number: GG11D1D | Price: $98.00

Spec 11D1/ISO 14310:2008
Packers and Bridge Plugs—Chinese
Chinese translation of Spec 11D1.


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Recommended Practice for Evaluation of Well Perforators (formerly RP 43)

Provides standard testing procedures for evaluating perforating devices used in center-set mandrels or with tubing-retrievable applications. Additionally, it includes information regarding performance testing and calibration procedures.

This procedure enables users to compare the conductivity characteristics of various hydraulic fracture proppant materials under laboratory conditions. The test results can aid users in comparing proppant materials for use in hydraulic fracturing operations.

RP 19B

Recommended Practice for Evaluation of Well Perforators—Chinese (formerly RP 43)

Provides standard testing procedures for evaluating perforating devices used in center-set mandrels or with tubing-retrievable applications. Additionally, it includes information regarding performance testing and calibration procedures.

Spec 19G1/ISO 17078-1:2004

Side-Pocket Mandrels

Provides requirements for side-pocket mandrels used in the petroleum and natural gas industry. Spec 19G1 includes specifying, selecting, designing, manufacturing, quality control, testing, and preparation for shipping of side-pocket mandrels.

RP 19D

Recommended Practice for 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.


Flow-Control Devices for Side-Pocket Mandrels

Provides requirements for subsurface flow-control devices used in side-pocket mandrels (hereafter called flow-control devices) intended for use in the worldwide petroleum and natural gas industry. This includes requirements for specifying, selecting, designing, manufacturing, quality-control, testing, and preparation for shipping of flow-control devices.


Running Tools, Pulling Tools and Kick-Over Tools and Latches for Side-Pocket Mandrels

Provides requirements and guidelines for running tools, pulling tools, kick-over tools, and latches used for the installation and retrieval of flow control and other devices to be installed in side pocket mandrels for use in the petroleum and natural gas industries. This includes requirements for specifying, selecting, designing, manufacturing, quality control, testing, and preparation for shipping of these tools and latches.

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.

This publication is a new entry in this catalog.

This publication is related to an API licensing, certification, or accreditation program.
retrieval, maintenance, and reconditioning of used running, pulling, and kick-over tools and latches are outside the scope of Spec 19G3. Center-set and tubing retrievable mandrel applications are not covered.

This edition of API Spec 19G3 is the identical national adoption of ISO 17078-3:2009. Pages: 43

1st Edition | June 2011 | Product Number: GG19G301 | Price: $145.00

Practices for Side-Pocket Mandrels and Related Equipment
Provides informative documentation to assist the user/purchaser and the supplier/manufacturer in specification, design, selection, testing, calibration, reconditioning, installation, and use of side-pocket mandrels, flow-control devices, and associated latches and installation tools. The product-design and manufacturing-related requirements for these products are included within the other parts of ISO 17078. The content and coverage of several industry documents are compiled and refined within RP 19G4 (all parts).

This edition of API RP 19G4 is the identical national adoption of ISO 17078-4:2009. Pages: 48

1st Edition | June 2011 | Product Number: G19G401 | Price: $155.00

RP 19G9
Design, Operation, and Troubleshooting of Dual Gas-Lift Wells
Provides recommended practices for the design, operation, optimization, and troubleshooting of dual gas-lift wells. RP 19G9 also contains 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: $143.00

Spec 19V/ISO 28781:2010
Subsurface Barrier Valves and Related Equipment
Provides the requirements for subsurface barrier valves and related equipment as they are defined herein for use in the petroleum and natural gas industries. Included are the requirements for design, design validation, manufacturing, functional evaluation, repair, redress, handling, and storage. Subsurface barrier valves provide a means of isolating the formation or control systems such as computer systems, and control conduits not integral to the barrier valve. Also not included are products covered under ISO 17078, ISO 16070, ISO 14310, ISO 10432, ISO 10423, and the following products: downhole chokes, wellhead plugs, sliding sleeves, casing-mounted flow-control valves, injection valves, well-condition-activated valves, or drill-stem test tools. This document does not cover the connections to the well conduit.

This edition of API Spec 19V is the modified national adoption of ISO 28781:2010, with the addition of the API Monogram Program annex. Pages: 58

1st Edition | May 2013 | Product Number: GG19V01 | Price: $150.00

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: January 2012
Product Number: G31A01 | Price: $97.00

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: September 2010
Product Number: G41002 | Price: $76.00

SUPPLY CHAIN MANAGEMENT
Spec 20A
Open Die Shaped Forgings for Use in the Petroleum and Natural Gas Industry
(includes Addendum 1 dated October 2013)
Specifies requirements for the design, foundry qualification, production, marking, and documentation of carbon steel, alloy steel, stainless steel, and nickel base alloy castings used in the petroleum and natural gas industries when referenced by an applicable API equipment standard or otherwise specified as a requirement for compliance. This standard applies to castings used in the manufacture of pressure containing, pressure controlling, and primary load bearing components. Castings manufactured in accordance with this API standard may be produced using any industry standard casting method. This standard establishes requirements for four casting specification levels (CSL). These four CSL designations define different levels of cast product technical, quality, and qualification requirements. Pages: 29

1st Edition | March 2012 | Product Number: G20A01 | Price: $73.00

Spec 20B
Closed Die Forgings for Use in the Petroleum and Natural Gas Industry
(includes Errata dated December 2013)
Specifies requirements for the qualification and production of open die shaped 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. This API standard is applicable to equipment used in the oil and natural gas industries where service conditions warrant the use of individually shaped open die forgings, including rolled rings. Examples include pressure containing or load bearing components. Forged bar, rolled bar, and forgings from which multiple parts are removed are beyond the scope of this specification. This API standard establishes requirements for four forging specification levels (FSL). These four FSL designations define different levels of forged product technical, quality, and qualification requirements. Pages: 20

1st Edition | April 2013 | Product Number: G20B01 | Price: $85.00

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. Spec 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: $74.00
This standard establishes requirements for three bolting specification levels, which the purchaser is included. Equipment standard or otherwise specified as a requirement for compliance. Industries. This standard applies when referenced by an applicable API 1st Edition | August 2012 | Product Number: G20E01 | Price: $74.00

• hot formed nuts ≥ 1.5 in. (38.1 mm) nominal diameter. Pages: 19
• hot formed nuts < 1.5 in. (38.1 mm) nominal diameter; and
• roll threaded studs, bolts, and screws ≥ 1.5 in. (38.1 mm) diameter;
• hot formed bolts and screws < 1.5 in. (38.1 mm) nominal diameter;
• machined bolts, screws, and nuts;
• machined studs;
• cold formed bolts, screws, and nuts (BLS-1 only);
• hot formed bolts and screws < 1.5 in. (38.1 mm) nominal diameter;
• hot formed bolts and screws ≥ 1.5 in. (38.1 mm) nominal diameter;
• roll threaded studs, bolts, and screws < 1.5 in. (38.1 mm) diameter;
• roll threaded studs, bolts, and screws ≥ 1.5 in. (38.1 mm) diameter;
• hot formed nuts < 1.5 in. (38.1 mm) nominal diameter; and
• hot formed nuts ≥ 1.5 in. (38.1 mm) nominal diameter. Pages: 19

1st Edition | September 2013 | Product Number: G20D01 | Price: $85.00

• machined studs;
• machined bolts, screws, and nuts;
• cold formed bolts, screws, and nuts (BLS-1 only);
• hot formed bolts and screws < 1.5 in. (38.1 mm) nominal diameter;
• hot formed bolts and screws ≥ 1.5 in. (38.1 mm) nominal diameter;
• roll threaded studs, bolts, and screws < 1.5 in. (38.1 mm) diameter;
• roll threaded studs, bolts, and screws ≥ 1.5 in. (38.1 mm) diameter;
• hot formed nuts < 1.5 in. (38.1 mm) nominal diameter; and
• hot formed nuts ≥ 1.5 in. (38.1 mm) nominal diameter. Pages: 19

1st Edition | August 2012 | Product Number: G20E01 | Price: $74.00

DRILLING AND PRODUCTION OPERATIONS

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

Product Number: G45003 | Price: $142.00

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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 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 | November 2006 | Reaffirmed: January 2012
Product Number: G09001 | Price: $182.00
You may access RP 90 in a read-only platform: publications.api.org

RP 92U
Underbalanced Drilling Operations
Provides 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 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

Product Number: G92U01 | Price: $105.00

RP 96
Deepwater Well Design and Construction
Provides engineers a reference for deepwater (DW) well design as well as drilling and completion operations. This recommended practice (RP) will also be useful to support internal reviews, internal approvals, contractor engagements, and regulatory approvals. The scope of this RP is to discuss DW drilling and completion activities performed on wells that are constructed using subsea blowout preventers (BOPs) with a subsea wellhead. This document addresses the following.

- Identifies the appropriate barrier and load case considerations to maintain well control during DW well operations (drilling, suspension, completion, production, and abandonment).
- Supplements barrier documentation in Std 65-2 with a more detailed description of barriers and discussion of the philosophy, number, type, testing, and management required to maintain well control. This document also supplements the barrier documentation in RP 90 in regard to annular pressure buildup. Abandonment barrier requirements are described for use when designing the well.
- Discusses load assumptions, resistance assumptions, and methodologies commonly used to achieve well designs with high reliability. The load case discussion includes less obvious events that can arise when unexpected circumstances are combined.
- Describes the risk assessment and mitigation practices commonly implemented during DW casing and equipment installation operations.

The purpose of this document is to enhance safety and minimize the likelihood of loss of well control or damage to the environment. These practices are generally intended to apply to subsea wells drilled with subsea BOPs in any water depth. Some of the descriptions of rig hardware and operations, such as remotely operated vehicles, are less relevant in shallower water depths [e.g. less than 500 ft (152 m)]. In these shallower water depths the operator may substitute alternative hardware or operations that maintain safety and system reliability.

The following aspects of DW well design and construction are outside the scope of this document.

- Detailed casing design load case definitions (does not include specific casing designs or design factors). Individual companies combine differing severities of loads and resistances or differing calculation methods to achieve designs with similar high levels of reliability.
- Wells drilled and/or completed with a surface BOP and high pressure riser from a floating production system; however, considerations for wells

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predrilled with floating rigs to be completed to a floating production system are included.

- Well control procedures (refer to RP 59 for well control information).
- Managed pressure drilling operations (including dual gradient drilling).
- Production operations and fluids handling downstream of the tree (subsea facilities/subsea architecture and surface facilities/offloading hydrocarbons).
- Intervention operations.
- Quality assurance programs.

1st Edition | March 2013 | Product Number: G09601 | Price: $175.00

**Bull 97**

**Well Construction Interface Document Guidelines**

Contains the structure and content of a well control interface document (WCID) that links the drilling contractor’s safety case with the lease operator’s safety management system. It includes well-specific information such as the basis of design, the well execution plan, and critical well activity risk assessment. This document exhibits how management of change and risk assessment processes will apply during well construction activities and assure personnel competency. A WCID also aligns all parties to assure their health, safety, and environment (HSE) standards are not compromised and all applicable regulatory requirements are met while undertaking shared activities. A WCID will assign or delineate specific responsibilities for the lease operator’s personnel as well as provide a vehicle for the drilling contractor to intervene in the case that unsafe acts are identified. Pages: 18

1st Edition | December 2013 | Product Number: G09701 | Price: $65.00

**RP 98**

**Personal Protective Equipment Selection for Oil Spill Responders**

Provides general information and guidance for the development of oil spill responder personal protective equipment (PPE) control measures. Although an extensive amount of information has been developed on the topic of PPE for emergency responders, this document focuses on the PPE selection process as well as its technical evaluation based on the hazards present. The purpose of this recommended practice is to assist users in developing effective PPE control measures for oil spill responses using a systematic approach. This recommended practice is intended for any company, organization, or agency that oversees or responds to oil spills. It is not a comprehensive “how-to” guide to selecting PPE for every type of situation that may be encountered; rather, it is a guidance document that discusses how proper PPE selection may be a useful control measure for responders when engineering and administrative controls may not be feasible or effective in reducing exposure to acceptable levels. Pages: 79

1st Edition | August 2013 | Product Number: G09801 | Price: $130.00

**DRILLING AND PRODUCTION OPERATIONS:**

**TRAINING**

**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 problems encountered in gas-lifted wells. Pages: 143

Product Number: GVT063 | Price: $157.00

**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

Product Number: GVT015 | Price: $157.00

**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

Product Number: GVT033 | Price: $97.00

**Wireline Operations and Procedures**

*(Book 5 in the Vocational Training Series)*

Outlines 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 that wireline operations and procedures may serve to eliminate, minimize, or control and methods by which this may be accomplished. Pages: 60

Product Number: GVT053 | Price: $122.00

**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

Product Number: GT1004 | Price: $59.00
You may access RP T-1 in a read-only platform: publications.api.org

**RP T-2**

**Recommended Practice for 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

Product Number: GT7002 | Price: $59.00
You may access RP T-2 in a read-only platform: publications.api.org

**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 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 | October 1995 | Reaffirmed: June 2010
Product Number: GT4002 | Price: $59.00
You may access RP T-4 in a read-only platform: publications.api.org
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 recommended practice is applicable are the Helper/Assistant and Operator/Supervisor. Pages: 2

Product Number: GT6061 | Price: $59.00
You may access RP T-6 in a read-only platform: publications.api.org

RP T-7  
Training of Personnel in Rescue of Persons 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

Product Number: GT7002 | Price: $57.00
You may access RP T-7 in a read-only platform: publications.api.org

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 exploration and production facilities improve their ties to their local communities. This document 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: $83.00

VOLUNTARY OPERATING AGREEMENTS AND BULLETINS

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

Assists the petroleum industry in understanding the Spill Prevention, Control, and Countermeasure (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 worker; or offshore oil drilling, production, or worker) 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. The purchase of D16 includes Bull D16, the Plan Template, and a CD-ROM with the Microsoft® Word version of the Plan Template.

5th Edition | April 2011 | Product Number: GD1605
Price: $258.00 | Template Only: Price: $95.00

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

API HF1  
Hydraulic Fracturing Operations—Well Construction and Integrity Guidelines

Provides guidance and highlights 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 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: $42.00
You may access API HF1 in a read-only platform: publications.api.org

API HF2  
Water Management Associated with Hydraulic Fracturing

Identifies and describe many of the current industry best practices used to minimize environmental and societal impacts associated with the acquisition, use, management, treatment, and disposal of water and other fluids associated with the process of hydraulic fracturing. While this document focuses primarily on issues associated with hydraulic fracturing pursued in deep shale gas development, it also describes the important distinctions related to hydraulic fracturing in other applications.

Moreover, this guidance document focuses on areas associated with the water used for purposes of hydraulic fracturing and does not address other water management issues and considerations associated with oil and gas exploration, drilling, and production. These topics will be addressed in future API documents. Pages: 40

1st Edition | June 2010 | Product Number: GHF201 | Price: $42.00
You may access API HF2 in a read-only platform: publications.api.org

API HF3  
Practices for Mitigating Surface Impacts Associated with Hydraulic Fracturing

Identifies and describes practices currently used in the oil and natural gas industry to minimize surface environmental impacts-potential impacts on surface water, soils, wildlife, other surface ecosystems, and nearby communities-associated with hydraulic fracturing operations. While this document focuses primarily on issues associated with operations in deep shale gas developments, it also describes the important distinctions related to hydraulic fracturing in other applications. Pages: 18

1st Edition | January 2011 | Product Number: GHF301 | Price: $42.00

This publication is new to this catalog.

This publication is related to an API licensing, certification, or accreditation program.
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, worker, 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

Product Number: G49003 | Price: $88.00
You may access RP 49 in a read-only platform: publications.api.org

RP 49 *
Recommended Practice for Drilling and Well Service Operations Involving Hydrogen Sulfide—Kazakh
Kazakh translation of RP 49.
2nd Edition | May 2001 | Product Number: G04902K | Price: $71.00
You may access RP 49 in a read-only platform: publications.api.org

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 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: $52.00
You may access RP 51R in a read-only platform: publications.api.org

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

Product Number: G54003 | Price: $125.00
You may access RP 54 in a read-only platform: publications.api.org

RP 54 *
Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations—Kazakh
Kazakh translation of RP 54.
3rd Edition | August 1999 | Product Number: G54003K | Price: $100.00
You may access RP 54 in a read-only platform: publications.api.org

RP 55
Recommended Practices for 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

Product Number: G55002 | Price: $115.00
You may access RP 55 in a read-only platform: publications.api.org

RP 67
Recommended Practice for Oilfield Explosives Safety

Applies to explosives used in oil and gas well operations, more specifically, explosives used inside the wellbore. 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, sideway 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

Product Number: G06702 | Price: $85.00
You may access RP 67 in a read-only platform: publications.api.org

RP 67 *
Recommended Practice for Oilfield Explosives Safety—Kazakh
Kazakh translation of RP 67.
2nd Edition | May 2007 | Product Number: G09308K | Price: $68.00
You may access RP 67 in a read-only platform: publications.api.org

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

Product Number: G74001 | Price: $61.00
You may access RP 74 in a read-only platform: publications.api.org

RP 75
Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities

Provides guidance for use in preparing safety and environmental management programs 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, start-up, operation, inspection, and maintenance of new, existing, and modified facilities. Pages: 41

Product Number: G07503 | Price: $89.00
You may access RP 75 in a read-only platform at publications.api.org

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### 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**

Provides 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 | November 2007 | Product Number: G75L01 | Price: $34.00

You may access RP 75L in a read-only platform: publications.api.org

### 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 place either Contractor and/or Operator personnel and/or equipment at risk. It is important that operators 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 | November 2007 | Product Number: G07602 | Price: $57.00

You may access RP 76 in a read-only platform: publications.api.org

### HEALTH, ENVIRONMENT, AND SAFETY: GENERAL

#### Achieving Common Sense Environmental Regulation: Oil and Gas Exploration and 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 exploration and production 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

March 2001 | Product Number: I47020 | Price: $122.00

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* This publication is a new entry in this catalog.
* This publication is related to an API licensing, certification, or accreditation program.
**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: $115.00

**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 1997 | Product Number: G71011 | Price: $115.00

**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: $115.00

**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: 85

October 1997 | Product Number: G71031 | Price: $115.00

**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: $115.00

**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: $115.00

**HEALTH, ENVIRONMENT, AND SAFETY: WASTE**

**Guidelines for Commercial Exploration and Production Waste Management Facilities**

Provides guidelines for the design and operations of commercial exploration and production 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. Pages: 80


**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.

2006 | Product Number: I0PL06 | For a free copy, please visit www.api.org/aboutoilgas/sectors/explore/livestock.cfm

**SECURITY**

**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: $125.00

**Security Guidelines for the Petroleum Industry**

API's 3rd Edition of this document 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: 58

3rd Edition | April 2005 | Product Number: OS0002 | Price: $191.00

You may access this document in a read-only platform: publications.api.org
Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

API 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. This document 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: $191.00
You may access this in a read-only platform: publications.api.org

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 | Reaffirmed: September 2010
Product Number: G07001 | Price: $57.00

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 | Reaffirmed: January 2012
Product Number: G7003 | Price: $61.00
Chapter 2.2A
Measurement and Calibration of Upright Cylindrical Tanks by the Manual Strapping Method
Contains procedures for calibrating upright cylindrical tanks used primarily for the storage of petroleum liquids. This standard 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. Ch. 2.2A should be used in conjunction with Ch. 2.2B. These two standards combined supersede the previous Std 2550. Pages: 58
Product Number: H022A1 | Price: $125.00
You may access Ch. 2.2A in a read-only platform: publications.api.org

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. Ch. 2.2B should be used in conjunction with Ch. 2.2A. Pages: 8
Product Number: H30023 | Price: $83.00
You may access Ch. 2.2B in a read-only platform: publications.api.org

Chapter 2.2C/ISO 7507-3:1993
Calibration of Upright Cylindrical Tanks Using the Optical-Reference Line Method
(ANSI/API MPMS 2.2C)
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 Ch. 2.2C is the national adoption of ISO 7507-3:1993. Pages: 19
Product Number: H022C1 | Price: $83.00

Chapter 2.2D/ISO 7507-4:1995
Calibration of Upright Cylindrical Tanks Using the Internal Electro-Optical Distance Ranging Method
(ANSI/API MPMS 2.2D)
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 Ch. 2.2D is the national adoption of ISO 7507-4:1995. Pages: 13
Product Number: H022D1 | Price: $83.00

Chapter 2.2E/ISO 12917-1:2002
(Includes Errata dated November 2009) (ANSI/API MPMS 2.2E)
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 document 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 Ch. 2.2E is the national adoption of ISO 12917-1:2002. Pages: 18
Product Number: HX202E01 | Price: $88.00

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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)

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 method.

This edition of Ch. 2.2F is the national adoption of ISO 12917-2:2002.

Product Number: H2202F01 | Price: $77.00

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.

Product Number: H25520 | Price: $97.00
You may access Std 2552 in a read-only platform: publications.api.org

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.

Product Number: H25540 | Price: $115.00
You may access Std 2554 in a read-only platform: publications.api.org

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.

2nd Edition | August 1993 | Reaffirmed: November 2013
Product Number: H25560 | Price: $76.00
You may access RP 2556 in a read-only platform: publications.api.org

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, and c) calibration from vessel drawings. This document and Ch. 2.8A supersede the previous Std 2553.

A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM 2 Section 5A.

Product Number: H30044 | Price: $59.00

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 Ch. 2.7 supersede the previous Std 2553. A joint API/ Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM 2 Section 5B.

Product Number: H30049 | Price: $89.00

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 Ch. 2.7 and Ch. 2.8A. Establishes reference gauge heights during calibration of marine tank vessels. A reference gauge point is necessary for converting ullage to inmage and when determining the volume of the quantities remaining on board. A reference gauge point is also used for wedge formulas and establishing wedge tables.

Product Number: H028B1 | Price: $97.00

Chapter 3
Tank Gauging

Covers 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.

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.

3rd Edition | August 2013 | Product Number: H301A03 | Price: $100.00
You may access Ch. 3.1A in a read-only platform: publications.api.org

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.

Product Number: H301B2 | Price: $97.00
You may access Ch. 3.1B in a read-only platform: publications.api.org
storage and transportation requirements and the methods of (LPG), natural gas liquid (NGL), and other petrochemical liquids where the hydrocarbon liquids covered include the following: liquefied petroleum gas covers pressurized and refrigerated light hydrocarbon liquids. The light covers the standard practice for level measurement of light hydrocarbon Liquids Onboard Marine Vessels by

Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Tanks 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 of 15 psi (103 kPa) or greater, stored in stationary, pressurized storage tanks. This standard also provides guidance on the requirements for data collection, transmission, and receiving. This standard supersedes all applicable sections of Std 2545. Pages: 10

Chapter 3.3

Chapter 3.4

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 psia (103 kPa), transported aboard marine vessels (tankers and barges). This standard also provides guidance on the requirements for data collection, transmission, and receiving. Pages: 10

Chapter 3.6

Measurement of Liquid Hydrocarbons by Hybrid Tank Measurement Systems

Covers selection, installation, commissioning, calibration, and verification of Hybrid Tank Measurement Systems 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

Chapter 4

Proving Systems

Serves as a guide for the design, installation, calibration, and operation of meter proving systems.

Chapter 4.1

Introduction

Provides general introduction to the subject of proving. The requirements in Ch. 4 are based on customary practices that evolved for crude oils and products covered by Ch. 11.1. The prover and meter uncertainties should be appropriate for the measured fluids and should be agreeable to the parties involved. Pages: 4

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

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

Chapter 3.1B

Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Tanks by Automatic Tank Gauging—Spanish

Spanish translation of Ch. 3.1B.

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

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 used in custody transfer for measuring the level of liquid hydrocarbons having a Reid vapor pressure of 15 psi (103 kPa) or greater, stored in stationary, pressurized storage tanks. This standard also provides guidance on the requirements for data collection, transmission, and receiving. Pages: 10

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 psia (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 Std 2545. Pages: 10

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. This publication covers pressurized and refrigerated light hydrocarbon liquids. The light hydrocarbon liquids covered include the following: 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

Chapter 4.1

Introduction

Provides general introduction to the subject of proving. The requirements in Ch. 4 are based on customary practices that evolved for crude oils and products covered by Ch. 11.1. The prover and meter uncertainties should be appropriate for the measured fluids and should be agreeable to the parties involved. Pages: 4

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Chapter 4.5
Master-Meter Provers
Covers the use of displacement, turbine, Coriolis, and ultrasonic meters as master meters. The requirements in this standard are intended for single-phase liquid hydrocarbons. Meter proving requirements for other fluids should be appropriate for the overall custody transfer accuracy and should be agreeable to the parties involved. This document does not cover master meters to be used for the calibration of provers. For information concerning master meter calibration of provers, see Ch. 4.9.3. Pages: 14

3rd Edition | November 2011
Product Number: H40303 | Price: $73.00
You may access Ch. 4.5 in a read-only platform: publications.api.org

Chapter 4.6
Pulse Interpolation
(includes Errata 1 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

Product Number: H04062 | Price: $65.00
You may access Ch. 4.6 in a read-only platform: publications.api.org

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: $86.00
You may access Ch. 4.7 in a read-only platform: publications.api.org

Chapter 4.8
Operation of Proving Systems
Provides information for operating meter provers on single-phase liquid hydrocarbons. It is intended for use as a reference manual for operating proving systems. The requirements of this chapter are based on customary practices for single-phase liquids. This standard is primarily written for hydrocarbons, but much of the information in this chapter may be applicable to other liquids. Specific requirements for other liquids should be agreeable to the parties involved. Pages: 40

2nd Edition | September 2013 | Product Number: H04082 | Price: $125.00

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:

• equipment performance,
• observation errors,
• proving volume calibration errors, and
• calculation errors. Pages: 28

1st Edition | October 2005 | Reaffirmed: September 2010
Product Number: H409011 | Price: $76.00

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 | Reaffirmed: September 2010
Product Number: H409021 | Price: $182.00

Chapter 4.9.3
Methods of Calibration for Displacement and Volumetric Tank Provers
Part 3—Determination of the Volume of Displacement Prov er by the Master Meter Method of Calibration
Covers the procedures required to determine the field data necessary to calculate a base prover volume of a field displacement prover by the master meter method for calibration. This standard applies to liquids that for all practical purposes are considered to be clean, single-phase, homogeneous, and Newtonian at metering conditions. Detailed calculation procedures are not included in this standard: see Ch. 12.2.5. Pages: 19

1st Edition | April 2010 | Product Number: H409031 | Price: $74.00

Chapter 4.9.4
Methods of Calibration for Displacement and Volumetric Tank Provers
Part 4—Determination of the Volume of Displacement and Tank Provers by the Gravimetric Method of Calibration
Covers the specific procedures, equipment, and calculations required to determine the base prover volume of both tank and displacement provers by the gravimetric method of calibration. This standard presents both U.S. customary and metric units and may be implemented in either system of units. The presentation of both units is for the convenience of the user and is not necessarily the exact conversions. The system of units to be used is typically determined by contract, regulatory requirement, the manufacturer, or the user’s calibration program. Throughout this document issues of traceability are addressed by references to National Institute of Standards and Technology. However, other appropriate national metrology institutes can be referenced. There is no intent to cover safety aspects of conducting the work described in this standard, and it is the duty of the user to be familiar with all applicable safety work practices. It is also the duty of the user to comply with all existing federal, state, or local regulations (e.g. the Occupational Safety and Health Administration) that govern the types of activities described in this standard and to be familiar with all such safety and health regulations. Pages: 38

1st Edition | October 2010 | Product Number: H4090401 | Price: $83.00

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
(includes Errata 1 dated June 2008 and Errata 2 dated June 2011)
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. Chapter 5 also includes information that will assist in troubleshooting and improving the performance of meters. Pages: 8

Product Number: H05014 | Price: $94.00
You may access Ch. 5.1 in a read-only platform: publications.api.org
Chapter 5.4 *
General Considerations for Measurement by Meters—Spanish
Spanish translation of Ch. 5.1.

Chapter 5.2
Measurement of Liquid Hydrocarbons by Displacement Meters
Ch. 5.2, together with the general considerations for measurement by meters found in Ch. 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 | Reaffirmed: September 2010
Product Number: H05023 | Price: $87.00
You may access Ch. 5.2 in a read-only platform: publications.api.org

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: $106.00
You may access Ch. 5.3 in a read-only platform: publications.api.org

Chapter 5.3 *
Measurement of Liquid Hydrocarbons by Turbine Meters—Spanish
Spanish translation of Ch. 5.3.
5th Edition | September 2005 | Product Number: H05030SS | Price: $106.00

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
Product Number: H05044 | Price: $94.00
You may access Ch. 5.4 in a read-only platform: publications.api.org

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 | Reaffirmed: September 2010
Product Number: H50502 | Price: $70.00

Chapter 5.6
Measurement of Liquid Hydrocarbons by Coriolis Meters (ANSI/API MPMS 5.6)
Describes methods for achieving custody transfer levels of accuracy when a Coriolis meter is used to measure liquid hydrocarbons. Topics covered include the following: applicable API standards used in the operation of Coriolis meters; proving and verification using both mass- and volume-based methods; and installation, operation, and maintenance. Both mass and volume-based calculation procedures for proving and quantity determination are included in Appendix E. Pages: 48
Product Number: H05061 | Price: $139.00

Chapter 5.8
Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters (ANSI/API MPMS 5.8)
Defines the application criteria for ultrasonic flow meters (UFMs) and addresses the appropriate considerations regarding the liquids to be measured. This document addresses the installation, operation, and maintenance of UFMs in liquid hydrocarbon service. The field of application of this standard is the dynamic measurement of liquid hydrocarbons. While this document is specifically written for custody transfer measurement, other acceptable applications may include allocation measurement, check meter measurement, and leak detection measurement. This document only pertains to spool type, multi-path ultrasonic flow meters with permanently affixed acoustic transducer assemblies. Pages: 23
2nd Edition | November 2011 | Product Number: H050682 | Price: $86.00

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 area 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: HDV6SF00 | Price: $96.00

Chapter 6
Metering Assemblies
Discusses 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 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
Product Number: H030121 | Price: $60.00

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. Pages: 30
Product Number: H06203 | Price: $79.00

*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.
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
Product Number: H60402 | Price: $65.00

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
Product Number: H30125 | Price: $65.00

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
Product Number: H30126 | Price: $65.00
You may access Ch. 6.6 in a read-only platform: publications.api.org

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
Product Number: H30127 | Price: $65.00
You may access Ch. 6.7 in a read-only platform: publications.api.org

Chapter 7
Temperature Determination
(Includes Addendum 1 dated October 2011)
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
Product Number: H07001 | Price: $187.00
You may access Ch. 7 in a read-only platform: publications.api.org

Chapter 7.3
Fixed Automatic Tank Temperature Systems
Describes the methods, equipment, and procedures for determining the temperature of petroleum and petroleum products under static conditions by the use of an automatic method. Automatic temperature measurement is discussed for custody transfer and inventory control for both onshore and marine measurement applications. Temperatures of hydrocarbon liquids under static conditions can be determined by measuring the temperature of the liquid at specific locations. Examples of where static temperature determination is required include storage tanks, ships, and barges. The application of this standard is restricted to automatic methods for the determination of temperature using fixed automatic tank thermometer (ATT) systems for hydrocarbons having a Reid vapor pressure at or below 101.325 kPa (14.696 psia). Although not included in the scope, requirements in this standard or other Ch. 7 sections (see the Foreword) can be used for other fluids and other applications including petroleum liquids having Reid vapor pressures in excess of 101.325 kPa (14.696 psia) tanks with inert gas systems and cryogenic liquids. However, such applications can require different performance and installation specifications. Pages: 27
2nd Edition | October 2011 | Product Number: H70302 | Price: $83.00

Chapter 7.3 *
Fixed Automatic Tank Temperature Systems—Spanish
Spanish translation of Ch. 7.3.
2nd Edition | October 2011 | Product Number: H70302S | Price: $83.00

Chapter 8
Sampling
Covers standardized procedures for sampling crude oil or its products.

Chapter 8.1
Standard Practice for Manual Sampling of Petroleum and Petroleum Products
(ARM D4057)
Covers procedures and equipment for manually obtaining samples of liquid petroleum and petroleum products, crude oils, and intermediate products from the sample point into the primary container. Procedures are also included for the sampling of free water and other heavy components associated with petroleum and petroleum products. This practice also addresses the sampling of semi-liquid or solid-state petroleum products. This practice provides additional specific information about sample container selection, preparation, and sample handling. This practice does not cover sampling of electrical insulating oils and hydraulic fluids. The procedures described in this practice may also be applicable in sampling most non-corrosive liquid industrial chemicals provided that all safety precautions specific to these chemicals are followed (also, refer to ASTM Practice E300). The procedures described in this practice are also applicable to sampling liquefied petroleum gases and chemicals. Pages: 48
4th Edition | October 2013 | Product Number: H80104 | Price: $120.00
You may access Ch. 8.1 in a read-only platform: publications.api.org

Chapter 8.2
Standard Practice for Automatic Sampling of Liquid 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: March 2010
Product Number: H08022 | Price: $97.00
You may access Ch. 8.2 in a read-only platform: publications.api.org

Chapter 8.2 *
Standard Practice Automatic Sampling of Liquid Petroleum and Petroleum Products—Spanish
Spanish translation of Ch. 8.2
2nd Edition | October 1995 | Product Number: H80202SP | Price: $97.00

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Chapter 8.3
Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products
(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 Ch. 8.1 and Ch. 8.2. Refer to Ch. 8.4 for the mixing and handling of light fuels for volatility measurement. Pages: 27
1st Edition | October 1995 | Reaffirmed: March 2010
Product Number: H80301 | Price: $89.00

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 kPa to 105 kPa (2 psia 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 2009
Product Number: H80402 | Price: $39.00

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
(ASTM D1298)
Covers the laboratory determination using a glass hydrometer in conjunction with a series of calculations, of the density, relative density, or API gravity of crude petroleum, petroleum products, or mixtures of petroleum and nonpetroleum products normally handled as liquids, and having a Reid vapor pressure of 101.325 kPa (14.696 psi) or less. Values are determined at existing temperatures and corrected to 15°C or 60°F by means of a series of calculations and international standard tables. The initial hydrometer readings obtained are uncorrected hydrometer readings and not density measurements.
Readings are measured on a hydrometer at either the reference temperature or at another convenient temperature, and readings are corrected for the meniscus effect, the thermal glass expansion effect, alternate calibration temperature effects and to the reference temperature by means of volume correction factors; values obtained at other than the reference temperature being hydrometer readings and not density measurements.

Chapter 9.2
Standard Test Method for Density or Relative Density of Light Hydrocarbons by Pressure Hydrometer
(ASTM D1657)
Covers the determination of the density or relative density of light hydrocarbons including liquefied petroleum gases (LPG) having Reid vapor pressures exceeding 101.325 kPa (14.696 psi). The prescribed apparatus should not be used for materials having vapor pressures higher than 1.4 MPa (200 psi) at the test temperature. This pressure limit is dictated by the type of equipment. Higher pressures can apply to other equipment designs. The initial pressure hydrometer readings obtained are uncorrected hydrometer readings and not density measurements. Readings are measured on a hydrometer at either the reference temperature or at another convenient temperature, and readings are corrected for the meniscus effect, the thermal glass expansion effect, alternate calibration temperature effects and to the reference temperature by means of calculations and volume correction factors (API MPMS Ch. 11.1) or API MPMS Ch. 11.2.4 (GPA TP-27), as applicable.
Values determined as density or relative density can be converted to equivalent values in the other units or alternative reference temperatures by means of Interconversion Procedures (API MPMS Ch. 11.5), or volume correction factors (API MPMS Ch. 11.1.1) or API MPMS Ch. 11.2.4 (GPA TP-27), as applicable. Pages: 6
3rd Edition | December 2012 | Product Number: H09023 | Price: $41.00
You may access Ch. 9.2 in a read-only platform: publications.api.org

Chapter 9.3
(ASTM D6822)
Covers the determination, using a glass thermohydrometer in conjunction with a series of calculations, of the density, relative density, or API gravity of crude petroleum, petroleum products, or mixtures of petroleum and nonpetroleum products normally handled as liquids and having a Reid vapor pressures of 101.325 kPa (14.696 psi) or less. Values are determined at existing temperatures and corrected to 15°C or 60°F by means of a series of calculations and international standard tables.
The initial thermohydrometer readings obtained are uncorrected hydrometer readings and not density measurements.
Readings are measured on a thermohydrometer at either the reference temperature or at another convenient temperature, and readings are corrected for the meniscus effect, the thermal glass expansion effect, alternate calibration temperature effects and to the reference temperature by means of calculations and volume correction factors (API MPMS Ch. 11.1).
Readings determined as density, relative density, or API gravity can be converted to equivalent values in the other units or alternate reference temperatures by means of Interconversion Procedures (API MPMS Ch. 11.5), or volume correction factors (API MPMS Ch. 11.1.1) or API MPMS Ch. 11.2.4 (GPA TP-27), as applicable. Pages: 10
3rd Edition | December 2012 | Product Number: H09033 | Price: $41.00
You may access Ch. 9.3 in a read-only platform: publications.api.org

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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

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

Product Number: H10013 | Price: $39.00
You may access Ch. 10.1 in a read-only platform: publications.api.org

Chapter 10.2
Standard Test Method for Water in Crude Oils by Distillation (ASTM D4006)

Specifies a method for the determination of water in crude petroleum by distillation. Pages: 11

3rd Edition | August 2013 | Product Number: H100203 | Price: $41.00
You may access Ch. 10.2 in a read-only platform: publications.api.org

Chapter 10.3
Standard Test Method for Water and Sediment in Crude Oil by the Centrifuge Method (Laboratory Procedure) (ASTM D4007)

Describes the laboratory determination of water and sediment in crude oils by means of the centrifuge procedure. This centrifuge method for determining water and sediment in crude oils is not entirely satisfactory. The amount of water detected is almost always lower than the actual water content. When a highly accurate value is required, the revised procedures for water by distillation, API MPMS Chapter 10.2, and sediment by extraction, API MPMS Chapter 10.1, shall be used. Pages: 13

You may access Ch. 10.3 in a read-only platform: publications.api.org

Chapter 10.4
Determination of Water and/or Sediment in Crude Oil by the Centrifuge Method (Field Procedure)

Describes the field centrifuge method for determining both water and sediment or sediment only in crude oil. This method may not always produce the most accurate results, but it is considered the most practical method for field determination of water and sediment. This method may also be used for field determination of sediment. Pages: 23

You may access Ch. 10.4 in a read-only platform: publications.api.org

Chapter 10.5
Standard Test Method for Water in Petroleum Products and Bituminous Materials by Distillation (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. Volatile water-soluble material, if present, may be measured as water. The specific products considered during the development of this test method were asphalt, bitumen, tar, fuel oil, lubricating oil, lubricating oil additives, and greases. For bituminous emulsions, refer to ASTM Test Method D244. Pages: 6

5th Edition | September 2013
Product Number: H100505 | Price: $41.00

Chapter 10.6
Standard Test Method for Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure) (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. Note that with some types of fuel oils such as residual fuel oils or distillate fuel oils containing residual components, it is difficult to obtain water or sediment contents with this test method. When this situation is encountered, API MPMS Ch. 10.5 or API MPMS Ch. 10.1 may be used. Pages: 7

5th Edition | August 2013 | Product Number: H100605 | Price: $41.00

Chapter 10.7

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 % in crude oils. Mercaptan and sulfide (S⁻ or H₂S) sulfur are known to interfere with the method. Pages: 6

Product Number: H10072 | Price: $39.00

Chapter 10.8

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 percent, but an equation to convert to volume percent is provided. Pages: 5

2nd Edition | November 2005 | Reaffirmed: March 2010
Product Number: H100802 | Price: $39.00

Chapter 10.9

Covers the determination of water in the range from 0.02 to 5.00 mass or volume % in crude oils. Mercaptan (RSH) and sulfide (S⁻ or H₂S) as sulfur are known to interfere with this test method, but at levels of less than 500 μg/g [ppm(m)], the interference from these compounds is insignificant. This test method can be used to determine water in the 0.005 to 0.02 mass % range, but the effects of the mercaptan and sulfide interference at these levels has not been determined. For the range 0.005 to 0.02 mass %, there is no precision or bias statement. This test method is intended for use with standard commercially available coulometric Karl Fischer reagent. Pages: 6

3rd Edition | May 2013 | Product Number: H09033 | Price: $41.00
You may access Ch. 10.9 in a read-only platform: publications.api.org

TR 2570
Continuous On-Line Measurement of Water in Petroleum (Crude Oil and Condensate)

Provides guidance for the application, installation, operation, verification, and proving of on-line water devices for use in the non-custody transfer measurement of water in crude oil and condensate. Pages: 17

1st Edition | October 2010 | Product Number: H25701 | Price: $73.00

This publication is a new entry in this catalog.

This publication is related to an API licensing, certification, or accreditation program.
TR 2573 • Standard Guide for Sediment and Water Determination in Crude Oil (ASTM D7829)

Covers a summary of the water and sediment determination methods from API MPWS Ch. 10 for crude oils. The purpose of this guide is to provide a quick reference to these methodologies such that the reader can make the appropriate decision regarding which method to use based on the associated benefits, uses, drawbacks, and limitations. Pages: 7

1st Edition | September 2013 | Product Number: H257301 | Price: $41.00

Chapter 11

Physical Properties Data (Volume Correction Factors)

Ch. 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 Ch. 11.1 are available in electronic form. These standards are not included in the complete set of API Manual of Petroleum Measurement Standards. Each element of Ch. 11 must be ordered separately.

Chapter 11.1–2004 Volume Correction Factors

(the 2004 edition of this standard also supersedes Ch. 11.2.1 and Ch. 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 153 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 1 dated September 2007)

Provides the algorithm and implementation procedure for the correction of temperature and pressure effects on density and volume of liquid hydrocarbons that fall within the categories of crude oil, refined products, or lubricating oils; natural gas liquids and liquefied petroleum gas 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 U.S. 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.

September 2004 | Product Number: H11013 | Reaffirmed: August 2012

Single User | Price: $512.00
2 to 10 Users | Price: $731.00
11 to 25 Users | Price: $947.00
51+ Users | Price: $1,433.00

You may access Ch. 11.1 (without the utility program) in a read-only platform: publications.api.org

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, correction for temperature and pressure of a liquid (CTPL), and compressibility coefficient ($F_p$). 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, and kg/m³), temperature (°F and °C) and pressure (psig, bar, and kPa).

To order the Add-In, contact Flow-Cal, Inc. at (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 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 correction for temperature and pressure of a liquid (CTPL), correction for the effect of temperature on liquid (CTL), and correction for the effect of pressure on liquid (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, and kg/m³, temperatures in °F and °C, and pressures in psig, bar, and kPa. This version is compatible with and can coexist with the 1980 version DLL.

To order the DLL, contact Flow-Cal, Inc. at (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

This publication is a new entry in this catalog. ◆ This publication is related to an API licensing, certification, or accreditation program.
Chapter 11.1
Source Code

ANSI C-Code used to compile the dynamic link libraries (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 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 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

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 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

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
(includes Errata 1 dated June 1996)
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. Pages: 246

Product Number: H27307 | Price: $171.00
You may access Ch. 11.2.2 in a read-only platform: publications.api.org

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

Product Number: H27309 | Price: $171.00

Chapter 11.2
Data File of Chapters 11.2.2 and 11.2.2M
This package includes a data file of tables found in Ch. 11.2.2 and Ch. 11.2.2M. The tables, presented in both U.S. customary and metric units, cover compressibility factors for light hydrocarbons.

1st Edition | August 1984 | Product Number: H27320 | Price: $296.00

Chapter 11.2.4
Temperature Correction for the Volume of NGL and LPG
Tables 23E, 24E, 53E, 54E, 59E, 60E
(includes Errata dated September 2011)
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 0.35 to 0.6880, which nominally equates to a density at 15 °C of 351.7 kg/m3 to 687.8 kg/m3 and a density at 20 °C of 331.7 kg/m3 to 686.6 kg/m3. The temperature range of this standard is 50.8 °F to 199.4 °F (-46 °C 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

Product Number: H1102041 | Price: $180.00

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 Ch. 11.2.1–1984 (now superseded by Ch. 11.1–2004) and Ch. 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 from compositional information, but the composition is not always measured for natural gas liquids (NGLs). Therefore, a correlation for the vapor pressure of NGLs baseline upon normally measured properties is required and is documented in this publication. Pages: 27

1st Edition | September 2007 | Reaffirmed: August 2012
Product Number: H1102051 | Price: $90.00

Chapter 11.3.2.1
Ethylene Density
Identifies an equation of state (EOS) suitable for use in custody transfer measurement of pure ethylene (>99 %) in the gaseous, liquid, and supercritical phases. Given flowing temperature and pressure, an EOS is capable of calculating density and other thermodynamic properties used to calculate mass and volumetric flow of ethylene to custody transfer accuracy. All accuracy and uncertainty statements in this standard are limited to the EOS results and do not include the uncertainty added by the primary and secondary measuring equipment. Pages: 4

2nd Edition | May 2013 | Product Number: H1132102 | Price: $60.00

Chapter 11.3.3
Ethanol Density and Volume Correction Factors
Covers density and volume correction factors for pure and denatured fuel ethanol. The actual standard consists of the explicit implementation procedures set forth in this document. Sample tables and other examples created from a computerized version of this implementation procedure are presented as examples only and do not represent the standard. This standard is applicable at any liquid operating temperature to pure (99 %) ethanol and denatured ethanol containing ASTM D4806 allowed denaturants (natural gasoline, gasoline blend stocks, and unleaded gasoline) in the 2 % to 5 % by volume range. Pages: 13

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 per cubic foot) 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 2012
Product Number: H25656 | Price: $296.00

Chapter 11.4.1
Properties of Reference Materials
Part 1—Density of Water and Water Volume Correction Factors for Calibration of Volumetric Provers
(includes Errata dated September 2011)
(replaces Ch. 11.2.3 and Ch. 11.2.3M)

Specifies the density of water to be used in all applicable API MPMS documents. 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: September 2013
Product Number: H11411 | Price: $53.00

Chapter 11.5
Density/Weight/Volume Intraconversion
[includes Errata dated September 2011 (updated September 2013)]
[replaces Ch. 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. Ch. 11.5, Parts 1 to 3 are available collectively on one CD-ROM.

1st Edition | March 2009 | Product Number: H1105CD | Price: $248.00

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);
- cubic metres per short ton at 15 °C in vacuo and in air (old Table 14); and
- 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) and
- 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) and
- 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; and
- 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 and
- cubic metres at 15 °C to barrels at 60 °F (old Table 52).

1st Edition | March 2009 | Product Number: H1105CD | Price: $248.00
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

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, non-liquid 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: 40

3rd Edition | April 2012 | Product Number: H1201013 | Price: $114.00

Chapter 12.1.2
Calculation of Static Petroleum Quantities, Part 2—Calculation Procedures for Tank Cars

(includes Ch. 12 Addendum 1 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 liquefied petroleum gas 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 | Reaffirmed: May 2011
Product Number: H12121 | Price: $111.00

Chapter 12.2.1
Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volume Correction Factors, Part 1—Introduction

(includes Ch. 12 Addendum 1 dated August 2007 and Errata 1 dated July 2009)

Provides the general introduction of this standard that 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

Product Number: H12021 | Price: $109.00
You may access Ch. 12.2.1 in a read-only platform: publications.api.org

Chapter 12.2.2
Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 2—Measurement Tickets

(includes Ch. 12 Addendum 1 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, calculation sequence, and discrimination levels to be employed in the calculations. Pages: 18

3rd Edition | June 2003 | Reaffirmed: September 2010
Product Number: H12223 | Price: $101.00
You may access Ch. 12.2.2 in a read-only platform: publications.api.org

Chapter 12.2.3
Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 3—Proving Reports

(includes Ch. 12 Addendum 1 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

Product Number: H12023 | Price: $119.00

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 Ch. 12 Addendum 1 dated August 2007 and Errata 1 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 of a displacement prover. Pages: 58

1st Edition | December 1997 | Reaffirmed: March 2009
Product Number: H12024 | Price: $122.00

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 Ch. 12 Addendum 1 dated August 2007 and Errata 1 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

1st Edition | September 2001 | Reaffirmed: August 2011
Product Number: H12025 | Price: $170.00

This publication is a new entry in this catalog. This publication is related to an API licensing, certification, or accreditation program.
Chapter 12.3
Calculation of Volumetric Shrinkage from Blending Light Hydrocarbons with Crude Oil
(includes Ch. 12 Addendum 1 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 Bull 2509C, 2nd Edition, 1967. Pages: 110
Product Number: H12031 | Price: $89.00

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
(includes Errata dated July 2013)
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
Product Number: H130321 | Price: $83.00

Chapter 13.1 *
Statistical Concepts and Procedures in Measurement—Spanish
Spanish translation of Ch. 13.1.
1st Edition | June 1985 | Product Number: H130101SP | Price: $83.00

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 Ch. 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 Ch. 4, Ch. 5, and Ch. 6 of API's Manual of Petroleum Measurement Standards. However, the procedures in Ch. 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
Product Number: H130321 | Price: $97.00

Chapter 14
Natural Gas Fluids Measurement
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
Product Number: H140106 | Price: $182.00

Chapter 14.2
Compressibility Factors of Natural Gas and Other Related Hydrocarbon Gases
(AGA Report No. 8)(GPA 8185-90)
Provides 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. Pages: 58
Order from American Gas Association, 400 N. Capitol Street NW, Washington, DC 20001 | 202-824-7000

Chapter 14.3.1
Concentric, Square-Edged Orifice Meters
Part 1—General Equations and Uncertainty Guidelines
(ANSI/API MPMS 14.3.1) (AGA Report No. 3, Part 1)
(includes Errata dated July 2013)
Provides a single reference for engineering equations, uncertainty estimations, construction and installation requirements, and standardized implementation recommendations for the calculation of flow rate through concentric, square-edged, flange-tapped orifice meters. Both U.S. customary units and international system of are included.
The mass flow rate and base (or standard) volumetric flow rate equations are discussed, along with the terms required for solution of the flow equation. The empirical equations for the coefficient of discharge and expansion factor are also presented. This revision includes a change to the empirical expansion factor calculation for flange-tapped orifice meters. Pages: 58
4th Edition | September 2012
Product Number: H1403014 | Price: $181.00

Chapter 14.3.2
Concentric, Square-Edged Orifice Meters
Part 2—Specification and Installation Requirements
(ANSI/API MPMS 14.3.2) (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
Product Number: H14324 | Price: $188.00
You may access Ch. 14.3.2 in a read-only platform: publications.api.org

Chapter 14.3.3
Concentric, Square-Edged Orifice Meters
Part 3—Natural Gas Applications
(ANSI/API MPMS 14.3.3) (AGA Report No. 3, Part 3)
Developed as an application guide for the calculation of natural gas flow through a flange-tapped, concentric orifice meter, using the U.S. Customary (USC) 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: 54
4th Edition | November 2013
Product Number: H1403034 | Price: $220.00
You may access Ch. 14.3.3 in a read-only platform: publications.api.org

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Fax Orders: 303-397-2740
Online Orders: www.global.ihs.com
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 procedure provides 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

Product Number: H30354 | Price: $164.00

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

Product Number: H30344 | Price: $59.00

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) (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: $73.00
You may access Ch. 14.5 in a read-only platform: publications.api.org

Chapter 14.6
Continuous Density Measurement
(includes Errata dated August 1998) (ANSI/API MPMS 14.6)

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 g/cm³ 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

Product Number: H30346 | Price: $132.00
You may access Ch. 14.6 in a read-only platform: publications.api.org

Chapter 14.7
Mass Measurement of Natural Gas Liquids
(GPA 8182-12)

Serves as a reference for the selection, design, installation, operation, and maintenance of single-phase dynamic liquid mass measurement systems that operate in the 351.7 kg/m³ to 687.8 kg/m³ (0.350 to 0.688 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 351.7 kg/m³ and above 687.8 kg/m³ (below 0.350 and above 0.688 relative density at 60 °F) and cryogenic fluids (colder than approximately –50.8 °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: 8


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 g/cm³. This edition revises the February 1983 version of the standard to incorporate the 1992 version of the Ch. 14.3 orifice meter discharge coefficient equation and revises and simplifies the mass flow rate sample calculations. Pages: 20

Product Number: H14082 | Price: $97.00
You may access Ch. 14.8 in a read-only platform: publications.api.org

Chapter 14.9
Measurement of Natural Gas by Coriolis Meter
(AGA Report No. 11)

Developed to assist designers and users in operating, calibrating, installing, maintaining, and verifying Coriolis flow meters used for natural gas flow measurement.

2nd Edition | February 2013
Order from the American Gas Association, 500 N. Capitol Street NW, Washington, DC 20001 | 202-824-7000

Chapter 14.10
Measurement of Flow to Flares

Addresses measurement of flow to flares, and includes the following:

• 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, and
• calculations.

The scope of this standard does not include analytical instrumentation. Pages: 54

1st Edition | July 2007 | Reaffirmed: June 2012
Product Number: H140101 | Price: $107.00

This publication is a new entry in this catalog.  This publication is related to an API licensing, certification, or accreditation program.
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

2-Year Extension: November 2012 | Product Number: H15003
Price: $115.00

Chapter 16
Measurement of Hydrocarbon Fluids by Weight or Mass

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 systems for the direct measurement of static mass of liquid hydrocarbons in storage tanks. This 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.) Pages: 20

Product Number: H16021 | Price: $97.00

Chapter 17
Marine Measurement

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. Pages: 68

Product Number: H170105 | Price: $129.00

Chapter 17.2
Measurement of Cargoes On Board Tank Vessels

Cover manual portable measurement units through deck-fitted vapor control valves and fixed automatic tank gauge 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, 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 liquefied petroleum gas and liquefied natural gas. Pages: 19

2nd Edition | May 1999 | Reaffirmed: September 2011
Product Number: H17022 | Price: $132.00

Chapter 17.3
Guidelines for Identification of the Source of Free Waters Associated with Marine Petroleum Cargo Movements

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

Product Number: H30407 | Price: $109.00

Chapter 17.4
Method for Quantification of Small Volumes on Marine Vessels (OBQ/ROB)

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 clinging, hydrocarbon vapors, cargoes in transit, or cargo pumpability (refer to Ch. 3). Pages: 20

Product Number: H30410 | Price: $97.00

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Chapter 17.4 *  
Method for Quantification of Small Volumes on Marine Vessels (OBQ/ROB)—Spanish

Spanish translation of Ch. 17.4.
1st Edition | October 1994 | Product Number: H30410SP | Price: $97.00

Chapter 17.5  
Guidelines for Voyage Analysis and Reconciliation of Cargo Quantities

Covers guidelines for the reconciliation of marine cargo quantities. 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 purchase of this document includes an Excel® spreadsheet for determining voyage analysis and reconciliation of cargo quantities.

Pages: 39
3rd Edition | April 2012 | Product Number: H170503 | Price: $145.00

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
Product Number: H170701 | Price: $97.00

Chapter 17.6 *  
Guidelines for Determining Fullness of Pipelines Between Vessels and Shore Tanks—Spanish

Spanish translation of Ch. 17.6.
1st Edition | August 1994 | Product Number: H17061SP | Price: $97.00

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 receive 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
Product Number: H17071 | Price: $97.00

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
Product Number: H17081 | Price: $97.00

Chapter 17.8 *  
Guidelines for Pre-Loading Inspection of Marine Vessel Cargo Tanks—Spanish

Spanish translation of Ch. 17.8.
1st Edition | August 1998 | Product Number: H17085SP | Price: $97.00

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 vessel experience factor on loading or vessel experience factor on discharging and to remove the possibility of any arbitrary inclusion or exclusion of data on the part of the individual(s) performing the final calculation.

The standard 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 liquefied petroleum gas. Pages: 22
2nd Edition | May 2012 | Product Number: H170902 | Price: $165.00

Chapter 17.9 *  
Vessel Experience Factor (VEF)—Spanish

Spanish translation of Ch. 17.9.
2nd Edition | May 2012 | Product Number: H170902S | Price: $165.00

Chapter 17.10.2  
Measurement of Refrigerated and/or Pressurized Cargoes On Board Marine Gas Carriers

Part 2—Liquefied Petroleum and Chemical Gases (includes Errata dated September 2010)

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
Product Number: H1701002 | Price: $113.00

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: H17011 | Price: $98.00

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**Chapter 17.11**  
Measurement and Sampling of Cargoes On Board Tank Vessels Using Closed/Restricted Equipment—Spanish  
Spanish translation of Ch. 17.11.  
1st Edition | May 2009 | Product Number: H170111SP | Price: $98.00

**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  

**Chapter 18**  
Custody Transfer  
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  

**Chapter 19**  
Evaporation Loss Measurement  
Covers methods for estimating hydrocarbon evaporation losses from various types of tanks. Note that Ch. 19 is not included in the complete set of API Manual of Petroleum Measurement Standards.

**Chapter 19.1**  
Evaporative Loss from Fixed-Roof Tanks  
(previously Publ 2518)  
Contains methodologies for estimating the total evaporative losses of hydrocarbons from fixed-roof tanks. The methodologies provide loss estimates for general equipment types based on laboratory, test-tank, and field-tank data. Types of fixed-roof tanks and roof fittings described are for information only.  
The equations estimate average annual losses from uninsulated fixed-roof tanks for various liquid stocks, stock vapor pressures, tank sizes, meteorological conditions, and operating conditions.  
The following special cases are addressed:  
• horizontal tanks,  
• higher volatility stocks (true vapor pressure greater than 0.1 psia), and  
• vent settings higher than 0.03 psia (0.5 oz/in²).  
The estimation may be improved by using detailed field information, including climatic data and operational data for the appropriate time period.  
The equations are not intended to be used in the following applications:  
• To estimate losses from unstable or boiling stocks or from petroleum liquids or petrochemicals for which the vapor pressure is not known or cannot readily be predicted [to calculate emissions from tanks that contain material at or above their boiling point or the point at which material starts to flash, the API model E&P Tank (Publ 4697) can be used].  
• To estimate losses from fixed-roof tanks that have an internal floating roof. Ch. 19.2 and TR 2569 address these.  
• To estimate losses from fixed-roof tanks that have either roof or shell insulation.  
• To estimate losses from cleaning fixed-roof tanks. TR 2568 addresses this.  
The 4th Edition of this document was published following a revision that was carried out concurrently with revisions to Ch. 19.2, published as the 3rd Edition and Ch. 19.4, published as the 3rd Edition. Primary changes are:  
• Consolidation of common material in Ch. 19.4. Material that had previously been included in both Ch. 19.1 and Ch. 19.2 has been moved to Ch. 19.4. Ch. 19.4, which was previously Recommended Practice for Speciation of Evaporative Losses, now has the title Evaporative Loss Reference Information and Speciation Methodology. This chapter had already contained reference information on the properties of chemicals and typical petroleum liquids, and this information has now been removed from Ch. 19.1 and Ch. 19.2. In addition, meteorological data have been moved from Ch. 19.1 and Ch. 19.2 to Ch. 19.4. In the revised documents:  
• meteorological data are found in Ch. 19.4;  
• calculation of storage tank temperatures is found in Ch. 19.1 and Ch. 19.2 (in that fixed-roof tanks involve calculation of the vapor space temperature in order to determine vapor density, whereas this step is not involved in estimating emissions from floating-roof tanks); and  
• calculation of true vapor pressure is found in Ch. 19.4 (in that this is now calculated in the same manner for both fixed- and floating-roof tanks). Pages: 26

4th Edition | October 2012 | Product Number: H190104 | Price: $140.00

**Chapter 19.1D**  
Documentation File for API Manual of Petroleum Measurement Standards Chapter 19.1—Evaporative Loss from Fixed-Roof Tanks  
(previously Bull 2518)  
(includes Errata 1 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 Ch. 19.1. Pages: 190  
1st Edition | March 1993 | Product Number: H30553 | Price: $171.00

**Chapter 19.2**  
Evaporative Loss from Floating-Roof Tanks  
(previously Publ 2517 and Publ 2519)  
Contains methodologies for estimating the total evaporative losses of hydrocarbons from external floating-roof tanks (EFRTs), freely vented internal floating-roof tanks (IFRTs), and domed external floating-roof tanks (domed EFRTs). The methodologies provide loss estimates for general equipment types based on laboratory, test-tank, and field-tank data. Types of floating roofs, rim-seal systems, and deck fittings are described for information only.  
The equations estimate average annual losses from floating-roof tanks for various types of tank construction, floating-roof construction, rim-seal systems, and deck fittings, as well as for various liquid stocks, stock vapor pressures, tank sizes, and wind speeds (EFRTs).  
The equations were developed for:  
• stocks with a true vapor pressure greater than approximately 0.1 psia,  
• average wind speeds ranging from 0 miles per hour (mph) to 15 mph (EFRTs), and  
• tank diameters greater than 20 ft.  
The estimation techniques become more approximate when these conditions are not met.

*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.*

This publication is a new entry in this catalog.  
This publication is related to an API licensing, certification, or accreditation program.
When this standard is used to estimate losses from non-freely vented (closed vent) internal or domed external floating-roof tanks (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), refer to the methodology in TR 2569.

The equations are not intended to be used in the following applications:
- To estimate losses from unstable or boiling stocks (i.e., with a true vapor pressure greater than the atmospheric pressure at the tank location) or from petroleum liquids or petroleum chemicals for which the vapor pressure is not known or cannot readily be predicted.
- To estimate losses from tanks in which the materials used in the rim seal, deck fittings, or deck seams have either deteriorated or been significantly permeated by the stored stock.
- To estimate losses from storage tanks that do not have a floating roof.
- To estimate losses from landing floating roofs (TR 2567 addresses this).
- To estimate losses from cleaning storage tanks (TR 2568 addresses this).

The 3rd Edition of Ch. 19.4 was published following a revision that was carried out concurrently with revisions to Ch. 19.1, published as the 4th Edition, and Ch. 19.2, published as the 3rd Edition. Primary changes are:
- Consolidation of common material in Ch. 19.4. Material that had previously been included in both Ch. 19.1 and Ch. 19.2 has been moved to Ch. 19.4. Ch. 19.4, which was previously Recommended Practice for Calculation of Evaporative Loss Reference Information and Speciation Methodology, now has the title Evaporative Loss Reference Information and Speciation Methodology. This chapter had already contained reference information on the properties of chemicals and typical petroleum liquids, and this information has now been removed from Ch. 19.1 and Ch. 19.2. In addition, meteorological data have been moved from Ch. 19.1 and Ch. 19.2 to Ch. 19.4. In the revised documents:
  - meteorological data are found in Ch. 19.4;
  - calculation of storage tank temperatures is found in Ch. 19.1 and Ch. 19.2 (in that fixed-roof tanks involve calculation of the vapor space temperature in order to determine vapor density, whereas this step is not involved in estimating emissions from floating-roof tanks); and
  - calculation of true vapor pressure is found in Ch. 19.4 (in that this is now calculated in the same manner for both fixed- and floating-roof tanks). Pages: 85

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 evaporation losses 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

Product Number: H1903C | Price: $122.00

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

Product Number: H1903D | Price: $122.00

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

Product Number: H1903E | Price: $122.00

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

Product Number: H1903H | Price: $122.00

Chapter 19.4
Evaporative Loss Reference Information and Speciation Methodology (includes Addendum 1 dated November 2013)

Provides methodology to estimate emissions of individual hydrocarbon species using the total emissions of multicomponent hydrocarbon mixtures (such as crude oils and gasoline) estimated from Ch. 19.1 for fixed-roof tanks, Ch. 19.2 for floating-roof tanks, Ch. 19.5 for marine vessels, and other methods used for total hydrocarbon emission estimates. This process is referred to as speciation.

Speciation of emissions from hydrocarbon mixtures accounts for the higher evaporation rate of the more volatile components, resulting in a different composition of the mixture in the vapor phase than in the liquid phase. The methodology presented in this standard assumes that there is sufficient liquid present such that the chemical composition at the liquid surface may be considered to not change as a result of the evaporative loss. This standard also contains reference information used for estimating emissions in accordance with Ch. 19.1, Ch. 19.2, and Ch. 19.5.

The methodology in this standard applies to:
- liquids with vapor pressure that has reached equilibrium with ambient conditions at a true vapor pressure less than the ambient atmospheric pressure (i.e., not boiling);
- liquids for which the vapor pressure is known or for which sufficient data are available to determine the vapor pressure; and
This methodology does not apply to:

- emissions that result from leaks from piping components (e.g. valves, flanges, pumps, connectors etc.);
- liquid mixtures where Raoult's Law cannot be used to describe the vapor phase equilibria (e.g. mixtures in which hydrocarbons are dissolved in water, or mixtures of hydrocarbons with alcohols).

This 3rd Edition of Ch. 19.4 was published following a revision that was carried out concurrently with revisions to Ch. 19.1, published as the 4th Edition, and Ch. 19.2, published as the 3rd Edition. Primary changes are:

- Consolidation of common material in Ch. 19.4. Material that had previously been included in both Ch. 19.1 and Ch. 19.2 has been moved to Ch. 19.4, Ch. 19.4, which was previously Recommended Practice for Specification of Evaporative Losses, now has the title Evaporative Loss Reference Information and Specification Methodology. This chapter had already contained reference information on the properties of chemicals and typical petroleum liquids, and this information has now been removed from Ch. 19.1 and Ch. 19.2. In addition, meteorological data have been moved from Ch. 19.1 and Ch. 19.2 to Ch. 19.4. In the revised documents:
  - meteorological data are found in Ch. 19.4;
  - calculation of storage tank temperatures is found in Ch. 19.1 and Ch. 19.2 (in that fixed-roof tanks involve calculation of the vapor space temperature in order to determine vapor density, whereas this step is not involved in estimating emissions from floating-roof tanks); and
  - calculation of true vapor pressure is found in Ch. 19.4 (in that this is now calculated in the same manner for both fixed- and floating-roof tanks). Pages: 136

3rd Edition | October 2012 | Product Number: H190403 | Price: $196.00

Chapter 19.5
Atmospheric Hydrocarbon Emissions from Marine Vessel Transfer Operations
(formerly Publ 2514A)

Provides methods for estimating evaporative loss from marine vessel transfer operations. Specifically, this standard addresses:

- loading stock into:
  - ship or ocean barges
  - shallow draft barges
  - 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 or ultra large crude carriers (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, 2nd Edition, September 1981, which is withdrawn. Pages: 31

1st Edition | September 2009 | Product Number: H19051 | Price: $124.00

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 accurately 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 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 lower 48 states. Pages: 194

July 1992 | Product Number: H25240 | Price: $157.00

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. Pages: 13

1st Edition | June 1993 | Product Number: H25580 | Price: $195.00

TR 2567
Evaporative Loss from Storage Tank Floating Roof Landings

Investigates 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: $106.00

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 trunk 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


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 Ch. 19.1, which specifically excludes fixed-roof tanks that have an internal floating roof, and Ch. 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 vacuum processing unit, or otherwise restricted from being freely vented). Pages: 26

1st Edition | August 2008 | Product Number: H25690 | Price: $107.00
Chapter 20
Allocation Measurement of Oil and Natural Gas

Chapter 20.1
Allocation Measurement
(includes Addendum 1 dated January 2013)
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 | September 1993 | Reaffirmed: September 2011
Product Number: H30701 | Price: $109.00
You may access Ch. 20.1 in a read-only platform: publications.api.org

Chapter 20.3
Measurement of Multiphase Flow
(supersedes RP 86)
This standard addresses multiphase flow measurement in the production environment, upstream of the custody transfer (single-phase) measurement point, where allocation measurement for onshore, offshore, or subsea is applied. For other multiphase flow measurement applications such as reservoir management, well tests, and flow assurance, the standard can be used as a reference or guide. However, the focus of this standard is on those applications where the accuracy of multiphase flow measurement for allocation systems is required.

This document refers to existing standards and recommended practices to supplement the guidance it provides in this subject area. The document addresses principles used in multiphase flow measurement, multiphase metering types and classifications, assessment of expected performance, and selecting and operating multiphase measurement systems. Operational requirements or constraints are addressed, including expectations for flow meter acceptance, calibration criteria, flow loop and in situ verifications, and other guidance specific to different multiphase flow metering applications. The document does not address specific meter configurations.

This edition of API MPMS Chapter 20.3 supersedes API Recommended Practice 86–2005, which is withdrawn. Pages: 72
1st Edition | January 2013 | Product Number: H200301 | Price: $180.00

RP 85
Use of Subsea Wet-Gas Flowmeters in Allocation Measurement Systems
(includes Addendum dated January 2013)
Provides 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
Product Number: G08501 | Price: $123.00

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 recommended practice (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.

Chapter 21
Flow Measurement Using Electronic Metering Systems

Chapter 21.1
Describes the minimum specifications for electronic gas measurement systems used in the measurement and recording of flow parameters of gaseous phase hydrocarbon and other related fluids for custody transfer applications utilizing industry recognized primary measurement devices. This standard provides the minimum reporting and change management requirements of the various intelligent components required for accurate and audible measurement. The requirements can be met by a combination of electronically and/or manually recorded configuration, test reports, change record reporting of the electronic gas measurement system components and flow parameters. It is recognized that diagnostic capabilities of the newer meter and transmitter technologies are important but due to the device specific complexity, intelligent device diagnostics are out of scope for this standard. Pages: 94
2nd Edition | February 2013 | Product Number: H210102 | Price: $165.00
You may access Ch. 21.1 in a read-only platform: publications.api.org

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 Ch. 12.2. Guidance applies to systems using turbine or positive displacement meters. Guidance applies to systems using on-line correction for the effect of temperature on liquid (CTL) and correction for the effect of pressure on liquid (CPL) compensation. The procedures and techniques in Ch. 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
Product Number: H21021 | Price: $191.00

Chapter 21.2-A1
Addendum 1 to Flow Measurement Using Electronic Metering Systems, Inferred Mass
Product Number: H2102A | Price: $60.00
Chapter 22
Testing Protocols
Testing protocols for devices used in the measurement of hydrocarbon fluids. Testing protocols define appropriate methods for measuring and reporting the performance characteristics of similar equipment in a comparable manner; thus providing a means to highlight the relative performance advantages and disadvantages of similar devices.

Chapter 22.1
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;
• devices or devices used to monitor and/or record operating conditions; and
• devices or instruments used to monitor, calculate, or measure key parameters in custody transfer applications. Pages: 16
Product Number: H22011 | Price: $76.00

Chapter 22.2
( supersedes Ch. 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 document are as follows:
• 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, and
• quantify the uncertainty of these devices and define the operating and installation conditions for which the stated uncertainties apply. Pages: 29
Product Number: H220201 | Price: $87.00

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: $79.00

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. Pages: 80
1st Edition | May 2004 | Product Number: H25661 | Price: $127.00

TR 2571
Fuel Gas Measurement
Provides a performance-based methodology for the measurement and reporting of fuel gas consumption. The document provides guidance in the following areas to allow the user to achieve a targeted uncertainty of measurement:
• selection of flow meter type; differential pressure, displacement, ultrasonic, Coriolis, vortex, turbine, thermal, and others;
• associated instrumentation for measuring fluid properties and flowing conditions, such as pressure and temperature transmitters, densimeters, and gas chromatographs;
• obtaining and use of gas composition or other analytical data;
• design and installation requirements of the measurement system;
• inspection, verification, and calibration practices of flow meters and their associated accessory instrumentation; and
• simplified uncertainty calculations with examples to illustrate the methodology.

Techniques are described to assess the uncertainty contribution of individual components of fuel gas measurement systems and overall facility fuel gas measurement uncertainty. Pages: 67
1st Edition | March 2011 | Product Number: H257101 | Price: $124.00

TR 2572
Carbon Content, Sampling, and Calculation
Carbon emission quantities can be calculated from either the volume/mass of fuel or feedstock fed to a process (as applicable) and carbon content of the process or fuel supply, or by directly measuring volume/mass emissions. This technical report (TR) provides guidance on the sampling and calculation of carbon content of process or fuel supplies. The API companion technical report, API TR 2571, can be referenced for guidance on measuring the volume/mass of process fuel gas or feedstock, and the API Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Natural Gas Industry can be reference for guidance on the calculation of emissions. TR 2572 provides guidance and a methodology for the determination of carbon content from hydrocarbon-based petroleum and petrochemical products, and the uncertainty of the average carbon content as calculated from multiple samples taken during a reporting period. This method is intended to make use of industry-accepted mixture property data and test methods with no new or modified test methods introduced in this document. The method is applicable to carbon-content-based reporting or trading for all gaseous and liquid hydrocarbons. This TR provides references and supplemental information on applicable industry practices based on the published resources, existing industry standards, industry-accepted physical constants or properties of hydrocarbons for measurement, sampling, sampling frequency, and analysis of hydrocarbon samples. Pages: 24
1st Edition | May 2013 | Product Number: H257201 | Price: $100.00

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**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: $115.00

Publ 1673
Compilation of Air Emission for Petroleum Distribution Dispensing Facilities
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: $81.00

**AVIATION**

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 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: $59.00

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, hereafter referred to as “pre-airfield storage terminals.” This recommended practice (RP) is intended to provide guidance on the minimum equipment standards and operating procedures for the receipt and storage of aviation fuels at pre-airfield storage terminals, located directly upstream of an airport, 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 breakout storage upstream of the pre-airfield storage terminal.

The design and construction provisions of this standard are intended for application at new facilities. Application of the design and construction provisions of this standard to facilities, equipment, structures, or installations that are already in place, that are in the process of construction, or that are installed before the date of this publication should be evaluated when circumstances merit. Such an evaluation should consider the site-specific circumstances and detailed accounting for both the potential and tolerance for risk, existing conditions at the installation, and overall benefit for applying the required design and construction provisions.

The operation, sampling, testing, and maintenance provisions in the various sections of this standard shall apply to both new and existing installations. Pages: 75
2nd Edition | October 2012 | Product Number: C159502 | Price: $232.00

**As of 2010, API does not maintain or distribute the following aviation fuel equipment related documents:**

EI 1529
Air Aviation Fuelling Hose

EI 1540
Design, Construction, Operation and Maintenance of Aviation Refueling Facilities, IP Model Code of Safe Practice Part 7

EI 1542
Identification Markings for Dedicated Aviation Fuel Manufacturing and Distribution Facilities, Airport Storage and Mobile Fuelling Equipment

EI 1550
Handbook on Equipment Used for the Maintenance and Delivery of Clean Aviation Fuel

EI 1581
Specification and Qualification Procedures for Aviation Jet Fuel Filter/Separators

EI 1582
Specification for Similarity for API/EI 1581 Aviation Jet Fuel Filter/Separators

EI 1584
Four-Inch Aviation Hydrant System Components and Arrangements

EI 1585
Guidance in the Cleaning of Aviation Fuel Hydrant Systems at Airports

EI 1590
Specifications and Qualification Procedures for Aviation Fuel Microfilters

EI 1594
Initial Pressure Strength Testing of Airport Fuel Hydrant Systems with Water

EI 1596
Design and Construction of Aviation Fuel Filter Vessels

EI 1597
Procedures for Overwing Fuelling to Ensure Delivery of the Correct Fuel Grade to an Aircraft

EI 1598
Considerations for Electronic Sensors to Monitor Free Water and/or Particulate Matter in Aviation Fuel

EI 1599
Laboratory Tests and Minimum Performance Levels for Aviation Fuel Dirt Defense Filters

The documents listed above are maintained and distributed by the Energy Institute. For ordering information, please refer to the following website: www.energypublishing.org

This publication is a new entry in this catalog. This publication is related to an API licensing, certification, or accreditation program.
MARKETING OPERATIONS

**RP 1525**

Bulk Oil Testing, Handling, and Storage Guidelines

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: $65.00

**RP 1604**

Closure of Underground Petroleum Storage Tanks

Provides operating procedures that may be used for the abandonment, removal, storage, temporarily out of service, and sale of used underground tanks that have contained gasoline or other flammable liquids. Pages: 9

3rd Edition | March 1996 | Reaffirmed: December 2010
Product Number: A16043 | Price: $76.00

**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: 89


**Publ 1621**

Bulk Liquid Stock Control at Retail Outlets

Primarily applies 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

Product Number: A16210 | Price: $83.00

**RP 1626**

Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Filling Stations

(includes Errata 1 dated February 2011)

Describes recommended practices for the storing, handling, and fire protection of ethanol and gasoline-ethanol blends from E1 to E10 and from E70 to E100 (used for E85) at distribution terminals and filling stations. Where information exists for gasoline-ethanol blends from E11 to E15 it is shared. Recommended practices for E16 through E69 are not covered because currently these blends are not legal gasoline blends or alternative fuels, there is a general lack of information on the properties of these blends, and there are currently no filling station components certified by any nationally recognized testing laboratory for these blends. Pages: 59

2nd Edition | August 2010 | Product Number: A16262 | Price: $155.00

**Std 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. Pages: 25

1st Edition | February 1996 | Product Number: A16421 | Price: $60.00

**RP 1637**

Using the API Color-Symbol System to Mark Equipment and Vehicles for Product Identification at Gasoline Dispensing Facilities and Distribution Terminals

(includes Errata 1 dated January 2007)

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 1542. Pages: 15

Product Number: A16373 | Price: $66.00
You may access RP 1637 in a read-only platform: publications.api.org

**RP 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

Product Number: A16391 | Price: $96.00

**RP 1640**

Product Quality in Light Product Storage and Handling Operations

Prepared by the API Fuels Marketing Subcommittee with technical participation and feedback from other industry stakeholders. Assists those involved in fuel handling at distribution and intermediate storage facilities. This publication provides guidance on the minimum equipment standards and operating procedures for the receipt, storage blending, and delivery of light products, their blend components, and additives at distribution and intermediate storage terminals, including related operations of pipeline, marine vessel (barge or ship), and road/rail transport. In addition, this document provides guidance for the design, construction, operation, and maintenance of light products storage and distribution terminals with the specific intent of protecting or ensuring product quality. Pages: 64

1st Edition | August 2013 | Product Number: A164001 | Price: $160.00

**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: $60.00

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This publication is a new entry in this catalog.

This publication is related to an API licensing, certification, or accreditation program.
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 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 | June 2011 | Product Number: A16451 | Price: $57.00

Std 2610
Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities (ANSI/API 2610)
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, safety features, 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 | Reaffirmed: December 2010
Product Number: C26102 | Price: $122.00

RP 2611
Terminal Piping Inspection—Inspection of In-Service Terminal Piping Systems
Covers the inspection of typical terminal piping systems within terminal boundaries, which includes off-plot piping. Off-plot piping includes, but is not limited to, piping between facilities, piping that comes from or goes to a refinery or other type facility, or piping that may cross a road, ditch, or other property outside the confines of a terminal facility. Piping for transportation of finished fuel products such as gasoline, diesel, lubricating oils, jet fuel, and aviation fuel are covered by the scope of this document. Also covered are piping systems for nonfuel-type fluids. The piping for other terminal nonfuel-type fluids typically found in terminals include asphaltic products, process water, transmission, slop water, and biofuels. This document does not include piping in a refinery facility, sanitary waste piping, cast iron piping, and nonmetallic gravity flow piping systems. Pages: 42
1st Edition | June 2011 | Product Number: A261101 | Price: $98.00

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

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: $59.00

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: B18351 | Price: $59.00

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 recordkeeping 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. 14 minutes. Pages: 65
January 1989 | Product Number: A11500 | Price: $103.00

RP 1004
Bottom Loading and Vapor Recovery for MC-306 & DOT-406 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-in. adapter. This edition requires an independent secondary control system and maximum requirements for outage in the tank to allow the secondary control system to function. Pages: 21
Product Number: A10048 | Price: $111.00
You may access RP 1004 in a read-only platform: publications.api.org

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
Product Number: A10071 | Price: $39.00
You may access RP 1007 in a read-only platform: publications.api.org

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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 appendices 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
Product Number: A11123 | Price: $76.00
You may access RP 1112 in a read-only platform: publications.api.org

MOTOR OILS AND LUBRICANTS

Motor Oil Shelf Cards
The purpose of 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. Shelf cards are available in English and Spanish and can be personalized with a company logo. For information on personalizing the shelf cards, call 202-682-8516.
Single copies free on request from API [eolcs@api.org or (202)-682-8516]
 Packs of 50 for $130.00

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 and the U.S. petroleum industry represented by API. This program will benefit consumers, the petroleum industry, and automobile manufacturers. Pages: 72

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 Symbols.
This directory can be accessed only through API’s website, 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
Price: Pack of 25 for $73.00

HEALTH, ENVIRONMENT, AND SAFETY: GENERAL

RP 2350
Overfill Protection for Storage Tanks in Petroleum Facilities
Addresses overfill protection for petroleum storage tanks. It recognized that prevention provides the most basic level of protection, thus while using both terms “protection” and “prevention,” the document emphasizes prevention. The standard’s scope covers minimum overfill (and damage) prevention practices for aboveground storage tanks in petroleum facilities, including refineries, marketing terminals, bulk plants, and pipeline terminals that receive flammable and combustible liquids.
Use of this standard is intended for storage tanks associated with marketing, refining, pipeline, and terminals containing Class I or Class II petroleum liquids. Use is recommended for Class III petroleum liquids. This standard does not apply to:
- underground storage tanks;
- aboveground tanks of 1320 U.S. gallons (5000 liters) or less;
- aboveground tanks which comply with PEI 600;
- pressure vessels;
- tanks containing non-petroleum liquids;
- tanks storing LPG and LNG;
- tanks at service stations;
- tanks filled exclusively from wheeled vehicles (i.e. tank trucks or railroad tank cars); and
- tanks covered by OSHA 29 CFR 1910.119 and EPA 40 CFR 68 or similar regulations.
This standard recommends application of PEI RP 600, Recommended Practices for Overfill Prevention for Shop-Fabricated Aboveground Tanks for overfill protection where applicable for aboveground tanks falling outside the scope of this document.
The purpose of this standard is to assist owner/operators and operating personnel in the prevention of tank overfills by implementation of a comprehensive overfill prevention process (OPP). The goal is to receive product into the intended storage tank without overfill or loss of containment.
This standard is one of minimum requirements. Alternate approaches or variations on the principles of this standard that provide equivalent or more robust overfill prevention are acceptable. Alternate approaches may be needed when the tank system varies from the typical configurations described in this standard. The rationale for the implementation of each OPP should be documented and retained by the owner and operator. Pages: 47
4th Edition | May 2012 | Product Number: K235004 | Price: $114.00
You may access RP 2350 in a read-only platform: publications.api.org

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: $76.00

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: $97.00
**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: 16

1st Edition | July 1996 | Product Number: A1628A | Price: $59.00

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: $59.00

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


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: $59.00

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: $59.00

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. Pages: 23

1st Edition | July 1996 | Product Number: A1628E | Price: $59.00

Publ 1629

Guide for Assessing and Remediating Petroleum Hydrocarbons in Soils

Provides information regarding the site and release characteristics relevant to 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: $150.00

**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 guidelines to companies to establish third-party network connections while protecting their individual systems and data from unauthorized access or manipulation. Pages: 36

1st Edition | November 2007 | Product Number: TSTP01 | Price: $90.00

**Security Guidelines for the Petroleum Industry**

API's 3rd Edition of this document 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: 58

3rd Edition | April 2005 | Product Number: OSV002 | Price: $191.00

You may access this document in a read-only platform: publications.api.org

**Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries**

API 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. This document 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: $191.00

You may access this document in a read-only platform: publications.api.org
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 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 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: $146.00
You may access Std 1164 in a read-only platform: publications.api.org
The pipeline industry hopes that these guidelines will help both pipeline operators and people working and living along pipeline ROW to better understand their respective responsibilities for maintaining the safety of this vital, but invisible, transportation system.

November 2009 | Product Number: DOGP04
Price: $67.00 for a packet of 5 | $515.00 for a customized PDF
(for more information on the customized PDF, contact API at publications@api.org)

**PIPELINE OPERATIONS PUBLICATIONS**

**RP 1102**
Steel Pipelines Crossing Railroads and Highways
(includes Errata 1 dated November 2008, Errata 2 dated May 2010, and Errata 3 dated September 2012)

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
Product Number: D11021 | Price: $116.00

**Std 1104**
Welding of Pipelines and Related Facilities

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, it 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.

This standard 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: 118
21st Edition | September 2013
Product Number: D110421 | Price: $345.00
You may access Std 1104 in a read-only platform: publications.api.org

**Std 1104**
Welding of Pipelines and Related Facilities—Kazakh

Kazakh translation of Std 1104.
21st Edition | September 2013
Product Number: D110420K | Price: $276.00
RP 1110
Marking Liquid Petroleum Pipeline Facilities
(includes Errata 1 dated November 2010)
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 recommended practice (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; hazard-
ous characteristics of the commodity being transported; and the pipeline
proximity to industrial, commercial, residential, and environmentally
sensitive areas. The pipeline marking programs are also integral parts of the
pipeline operator 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: 13
4th Edition | October 2010 | Product Number: D11094 | Price: $89.00
You may access RP 1109 in a read-only platform: publications.api.org

RP 1111
Recommended Practice for the Pressure Testing of Steel Pipelines
for the Transportation of Gas, Petroleum Gas, Hazardous Liquids,
Highly Volatile Liquids or Carbon Dioxide
Applies to all parts of a pipeline or pipeline facility including line pipe, pump
station piping, terminal piping, compressor station piping, metering station
piping, delivery station piping, regulator station piping, appurtenances
connected to line pipe, appurtenances connected to facility piping,
fabricated assemblies, valves, tees, elbows, reducers, flanges, and any other
pipeline equipment or appurtenances. This recommended practice (RP)
does not apply to pumping units, compressor units, breakout tanks,
pipeline vessels, control piping, sample piping, instrument piping/tubing, or
any component or piping system for which other codes specify pressure
testing requirements (i.e. ASME Boiler and Pressure Vessel Code, piping
systems covered by building codes, etc.). Although this RP contains
guidelines that are based on sound engineering judgment, it is important to
note that certain governmental requirements may differ from the guidelines
presented in this document. Nothing in this RP is intended to inhibit the use
of engineering solutions that are not covered by the RP. This may be
particularly applicable where there is innovative developing technology.
Where an alternative is offered, the RP may be used, provided any and all
variations from the RP are identified and documented. This RP does not
address piping systems that are pressure tested with natural gas, nitrogen,
or air. Pages: 25
6th Edition | February 2013 | Product Number: D11106 | Price: $95.00

RP 1115
Recommended Practice for the Design, Construction, Operation, and
Maintenance of Offshore Hydrocarbon Pipelines (Limited State Design)
(includes Errata 1 dated May 2011)
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.
SCADA) capabilities. Incremental improvement of leak detectability resulting from upgrading individual variables can also be determined.

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 supervisory control and data acquisition (SCADA) capabilities. Incremental improvement of leak detectability resulting from upgrading individual variables can also be determined.

The variables are ranked according to their importance to leak detectability. The variables are analyzed. The methodology are described and verified with field tests. 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 lineflow 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.

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.
RP 1161
Recommended Practice for Pipeline Operator Qualification
(includes Addendum 1 dated January 2013 and Addendum 2 dated July 2013)

Provides guidance for developing and maintaining a compliant Operator Qualification (OQ) program. Operators may choose to use all, part, or none of this document. Additionally, many components of this recommended practice (RP) also apply to gas transmission lines regulated under 49 CFR 192. Therefore, operators may choose to utilize the RP as applicable for these lines.

Operators should be aware that the OQ rule is applicable only to U.S. Department of Transportation jurisdictional pipelines. For purposes of this document, the word “pipeline” is used interchangeably with pipeline, pipeline facility, and pipeline system and any and all jurisdictional pipeline components as defined in 49 CFR Part 192.

This document is written to provide guidance for achieving compliance with the regulation at the time of publication and is comprised of two individual components: the Guidance Document and the API Covered Task List (Annex A). A separate publication, the API Covered Task Standards, will contain guidance on the individual covered tasks. This guidance will include knowledge and skill components, span of control, and abnormal operating conditions. Pages: 38

2nd Edition | April 2012 | Product Number: D11612 | Price: $155.00
You may access RP 1161 in a read-only platform: publications.api.org

RP 1162
Public Awareness Programs for Pipeline Operators

Provides guidance for pipeline operators to develop and manage public awareness programs tailored to meet the needs of the community. It is meant to raise the quality of public awareness programs and align baseline core safety messages across the oil and gas industry.

The scope of this recommended practice (RP) covers the development, implementation, evaluation, and documentation of public awareness programs associated with the normal operation of existing pipeline systems and facilities, including transmission pipelines, local distribution systems, and gathering lines. Two important objectives of this RP are to provide a framework to help each pipeline operator create and manage a public awareness program as well as a process for periodic program evaluation to encourage each operator to enhance the program, at the operator discretion, as circumstances warrant.

Communications related to new pipeline construction, offshore operations, and during emergencies are not covered by this RP nor is it intended to provide guidance to operators for communications about operator-specific performance measures that are addressed through other means of communication or regulatory reporting. Provides the operator with the elements of a recommended baseline public awareness program and considerations to determine when and how to enhance the program to provide the appropriate level of public awareness outreach. Enhancements may affect messages, delivery frequency and methods, geographic coverage areas, program evaluation, and other elements. Pages: 59

2nd Edition | December 2010 | Product Number: D11622 | Price: $124.00
You may access RP 1162 in a read-only platform: publications.api.org

Std 1163
In-Line Inspection Systems Qualification

Covers the use of in-line inspection (ILI) systems for onshore and offshore gas and hazardous liquid pipelines. This includes, but is not limited to, tethered, self-propelled, or free flowing systems for detecting metal loss, cracks, mechanical damage, pipeline geometries, and pipeline location or mapping. The standard applies to both existing and developing technologies. This standard is an umbrella document that provides performance-based requirements for ILI systems, including procedures, personnel, equipment, and associated software. Nothing in this standard is intended to inhibit the use of inspection systems or engineering solutions that are not covered by the standard. This may be particularly applicable where there is innovative developing technology. Where an alternative is offered, the standard may be used, provided any and all variations from the standard are identified and documented. Pages: 79

2nd Edition | April 2013 | Product Number: D11632 | Price: $131.00

Std 1164
Pipeline SCADA Security

Provides guidance to the operators of oil and gas liquid pipeline systems for managing supervisory control and data acquisition (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 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 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 guidelines set forth in the annexes assists in creating inherently secure operations. Implementation of this standard, to advance 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: $146.00
You may access Std 1164 in a read-only platform: publications.api.org

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 (SCADA) systems. 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.

Assists pipeline companies and SCADA system developers in identifying items that are considered best practices when developing human machine interfaces. Design elements that are discussed include, but are not limited to, hardware, navigation, colors, fonts, symbols, data entry, and control selection techniques. Pages: 45

Product Number: D11651 | Price: $152.00
You may access RP 1165 in a read-only platform: publications.api.org

RP 1166
Excavation Monitoring and Observation
(includes Errata 1 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 | Reaffirmed: November 2010
Product Number: D11661 | Price: $106.00
Pipeline Transportation

Fax Orders: 303-397-2740

Online Orders: www.global.ihs.com

**RP 1167**
Pipeline SCADA Alarm Management

Intended to provide pipeline operators with recommended industry practices in the development, implementation, and maintenance of an alarm management program. It provides guidance on elements that include, but are not limited to, alarm definition, alarm philosophy, documentation, management of change, and auditing.

Not intended to be a step-by-step set of instructions on how to build an alarm management system. Each pipeline operator has a unique operating philosophy and will therefore have a unique alarm philosophy as well. This document is intended to outline key elements that should be considered when building an alarm management system. Pages: 41

1st Edition | December 2010 | Product Number: D116701 | Price: $116.00

**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 noncontinuous 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. Pages: 11


**RP 1169**
Recommended Practice for Basic Inspection Requirements—New Pipeline Construction

Covers the basic requirements and their associated references needed to effectively and safely perform inspection activities during construction of new onshore pipelines. Use of this document will provide the basis for what construction inspectors need to know and where to find detailed information related to each facet of new pipeline construction inspection activities. The requirements are organized into the following major sections:

- inspector responsibilities,
- personnel and general pipeline safety,
- environmental and pollution control,
- general pipeline construction inspection.

Users of this document include those individuals either engaged in pipeline construction inspection or seeking to become certified inspectors. Pipeline owner/operators and pipeline inspection service companies may also use this document to aid and enhance their inspector training programs. Pages: 46

1st Edition | July 2013 | Product Number: D11691 | Price: $115.00

**RP 2200**
Repairing Crude Oil, Liquefied Petroleum Gas and Product Pipelines

Discuss guidelines to safe practices while repairing in-service pipelines for crude oil, liquefied petroleum gas, highly volatile liquids, 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: 11

4th Edition | September 2010 | Product Number: D22004 | Price: $71.00

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* 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.
Security Guidelines for the Petroleum Industry

API's 3rd Edition of this document 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: 58

3rd Edition | April 2005 | Product Number: OS0002 | Price: $191.00
You may access this document in a read-only platform: publications.api.org

Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

API 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. This document 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: $191.00
You may access this in a read-only platform: publications.api.org
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 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: $134.00

API 570 *

Piping Inspection Code: In-Service Inspection, Rating, Repair, and Alteration of Piping Systems—Chinese

Chinese translation of API 570.

3rd Edition | November 2009 | Product Number: C57003C | Price: $94.00

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: 362

2nd Edition | April 2011 | Product Number: C57102 | Price: $329.00

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: $154.00

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 that 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: 109

3rd Edition | October 2013 | Product Number: C57303 | Price: $150.00

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Supplements API 570 by providing piping inspectors with information that can improve skill and increase basic knowledge and practices. This document 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: $136.00

Inspection Practices for Piping System Components—Chinese

Chinese translation of RP 574.

3rd Edition | November 2009 | Product Number: C57403C | Price: $96.00

Inspection of Atmospheric and Low Pressure Storage Tanks (ANSI/API RP 575)

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 document is intended to supplement 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: $130.00

Inspection of Atmospheric and Low Pressure Storage Tanks—Chinese

Chinese translation of RP 575.

2nd Edition | April 2005 | Product Number: C57502C | Price: $91.00

Inspection of Pressure-Relieving Devices

Describes the inspection and repair practices for automatic pressure-relieving devices commonly used in the oil and petrochemical industry. 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 document 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: $134.00
risk-based inspection (RBI) program for fixed equipment and piping in the petrochemical industry. RBI 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, API 570, and Std 653 by: a) ensuring safety of plant personnel and the public while older equipment continues to operate; b) providing technically sound fitness-for-service assessment procedures to ensure that different service providers furnish consistent life predictions; and c) 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 rating 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 the ASME Flanged Pressure Vessel Code, and in accordance with NACE TM0284-2009. 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: $726.00
CD Only Price: $865.00
Hard Copy and CD Price: $1,167.00

API 579-2/ASME FFS-2
Example Problem Manual

Fitness-For-Service (FFS) assessments in Std 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 that may be operating under specific conditions that could produce a failure. Std 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 Std 579-1/ASME FFS-1 are currently recognized and referenced by the API codes and standards (API 510, API 570, and Std 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 Std 579-1/ASME FFS-1 are provided in this document. Example problems are provided for all calculation procedures in both SI and U.S. 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 Std 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 Std 579-1/ASME FFS-1. Pages: 366

1st Edition | August 2009 | Product Number: C57921 | Price: $155.00

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. This document is intended to supplement API 510, API 570, and Std 653. 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: $189.00

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:

• 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;
• allow management to review safety, environmental, and business-interruption risks in an integrated, cost effective manner; and
• 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 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; and
• 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

This publication is a new entry in this catalog.
◆ This publication is related to an API licensing, certification, or accreditation program.
centrifugal pumps, for use in petroleum, petrochemical, and gas industry process services. This document is applicable to overhead pumps, between bearings pumps, and vertically suspended pumps. Section 9 provides requirements applicable to specific types of pumps. All other clauses of this document apply to all pump types. Illustrations are provided of the various specific pump types and the designations assigned to each specific pump type. It does not cover seawell pumps. This edition of API Std 610 is the identical national adoption of ISO 13709:2009. Pages: 28

2nd Edition | December 2009 | Product Number: C58202 | Price: $124.00

**Std 652**
Welding Guidelines for the Chemical, Oil, and Gas Industries

Provides supplementary guidelines and practices for welding and related topics for shop and field welding, 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 for process equipment; b) tanks and attachments welded thereto; c) nonremovable internals of process equipment; d) structural items attached and related to process equipment; e) other equipment or component item when referenced by an applicable purchase order. This document is general in nature and is intended to augment the welding requirements of ASME Boiler and Pressure Vessel Code, 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: C58202R | Price: $100.00

**Std 653**
Tank Inspection, Repair, Alteration, and Reconstruction

Includes Addendum 1 dated August 2010, Addendum 2 dated January 2012, and Addendum 3 dated November 2013

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: $212.00
You may access Std 653 in a read-only platform: publications.api.org

**Std 653**
Tank Inspection, Repair, Alteration, and Reconstruction—Chinese

Chinese translation of Std 653.

4th Edition | April 2009 | Product Number: C65304C | Price: $149.00

**MECHANICAL EQUIPMENT STANDARDS FOR REFINERY SERVICE**

**Std 610/ISO 13709:2009**
Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries

(ANSI/API Std 610)

Includes Errata 1 dated July 2011

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. This document is applicable to overhead pumps, between bearings pumps, and vertically suspended pumps. Section 9 provides requirements applicable to specific types of pumps. All other clauses of this document apply to all pump types. Illustrations are provided of the various specific pump types and the designations assigned to each specific pump type. It does not cover seawell pumps. This edition of API Std 610 is the identical national adoption of ISO 13709:2009. Pages: 205

11th Edition | September 2010 | Product Number: CX61011 | Price: $257.00
You may access Std 610 in a read-only platform: publications.api.org

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This publication is a new entry in this catalog.

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Refining

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Std 617
Axial and Centrifugal Compressors and Expander-Compressors for Petroleum, Chemical and Gas Industry Services
(ANSI/API Std 617)
(includes Errata 1 dated June 2003)
Covers the minimum requirements for axial compressors, single-shaft and integrally geared process centrifugal compressors, and expander-compressors for use in the petroleum, chemical, and gas industries services that handle air or gas. This standard does not apply to fans (covered by Std 673) or blowers that develop less than 34 kPa (5 psi) pressure rise above atmospheric pressure. This standard also does not apply to packaged, integrally-gearred centrifugal plant and instrument air compressors (covered by Std 672). Hot gas expanders over 300 °C (570 °F) are not covered in this standard. Pages: 193
Product Number: C61707 | Price: $219.00

Std 618
Reciprocating Compressors for Petroleum, Chemical and Gas Industry Services
(ANSI/API Std 618)
(includes Errata 1 dated November 2009 and Errata 2 dated July 2010)
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 low-to-moderate 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: $181.00

Std 619/ISO 10440-1:2007
Rotary-Type Positive Displacement Compressors for Petroleum, Petrochemical and Natural Gas Industries
Specifies requirements for dry and oil-flooded, helical-lobe rotary compressors used for vacuum or pressure or both in petroleum, petrochemical, and gas industry services. It is intended for compressors that are in special-purpose applications. It is not applicable to general-purpose air compressors, liquid-ring compressors, or vane-type compressors.
This edition of API Std 619 is the identical national adoption of ISO 10440-1:2007. Pages: 135
5th Edition | December 2010 | Product Number: CX61905 | Price: $216.00

Std 670
Machinery Protection Systems
This standard covers the minimum requirements for a machinery protection system measuring radial shaft vibration, casing vibration, shaft axial position, shaft rotational speed, piston rod drop, phase reference, overspeed, and critical machinery temperatures (such as bearing metal and motor windings). It covers requirements for hardware (transducer and monitor systems), installation, documentation, and testing. Pages: 96
Product Number: C67004 | Price: $180.00

Std 671/ISO 10441:2007
Special Purpose Couplings for Petroleum, Chemical and Gas Industry Services
 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 unsupervised, 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 of special purpose couplings.
This edition of API Std 671 is the identical national adoption of ISO 10441:2007. Pages: 56
4th Edition | August 2007 | Reaffirmed: September 2010
Product Number: C67104 | Price: $167.00
You may access Std 671 in a read-only platform: publications.api.org

Std 672
Packaged, Integrally Geared Centrifugal Air Compressors for Petroleum, Chemical, and Gas Industry Services
(includes Errata 1 dated October 2007 and Errata 2 dated July 2010)
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
Product Number: C67204 | Price: $235.00

Std 673
Centrifugal Fans for Petroleum, Chemical and Gas Industry Services
(includes Errata 1 dated October 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 in. of water equivalent air pressure. Cooling tower, aerial cooler, and ventilation fans and positive displacement blowers are NOT covered by this standard. Pages: 89
Product Number: C67302 | Price: $151.00

Std 674
Positive Displacement Pumps—Reciprocating
Covers the minimum requirements for reciprocating positive displacement pumps and pump units for use in the petroleum, petrochemical, and gas industry services. Both direct-acting and power-frame types are included. Controlled-volume pumps, hydraulically driven pumps, and rotary pumps are not included. Pages: 95
3rd Edition | December 2010 | Product Number: C67403 | Price: $186.00

Std 675
Positive Displacement Pumps—Controlled Volume for Petroleum, Chemical, and Gas Industry Services
Covers the minimum requirements for reciprocating, controlled volume pumps, and pump units for use in the petroleum, petrochemical, and gas industry services. These pumps are either hydraulic diaphragm or packed plunger design. Rotary positive displacement pumps are not included. Diaphragm pumps that use direct mechanical actuation are also excluded.
NOTE: See Std 674 for positive displacement reciprocating pumps and Std 670 for positive displacement rotary pumps.
The text begins with an overview of the fundamentals of pulsation and mechanical theory in Section 3. The intent of Section 3 is to introduce terminology and define the elements of the analysis process. Section 4 begins with a discussion of the acoustic and mechanical modeling techniques associated with different design philosophies, which emphasize either pulsation or mechanical control, and concludes with a discussion on the appropriate selection of a design approach and philosophy. Section 5 discusses the effects of pulsation on the accuracy of various types of flow measurement devices. Section 6 summarizes the requirements for documenting study results. Section 7 offers guidance on the performance of field testing to validate the results of the design process and to troubleshoot pulsation or vibration problems. Finally, methodologies for conducting a dynamic analysis of the compressor or pump valve performance are described in Section 8. The material in this Part is generally applicable to all types of positive displacement machinery.

Part 2 deals specifically with reciprocating compressors and provides commentary regarding each paragraph of Section 7.9 of Std 618, 5th Edition. It is the intent of the API Subcommittee on Mechanical Equipment that similar material be provided on reciprocating pumps and screw compressors in future editions. Pages 128

1st Edition | April 2012 | Product Number: C68801 | Price: $156.00

Std 689/ISO 14224:2006 Collection and Exchange of Reliability and Maintenance Data for Equipment (ANSI/API Std 689)

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. Std 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 API Std 689 is the identical national adoption of ISO 14224:2006. Pages: 171

1st Edition | July 2007 | Product Number: C68901 | Price: $213.00

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 $59.00 each or for intransit licensing at $308.00 each.

Std 537 2nd Edition Std 660 8th Edition
Std 546 3rd Edition Std 662 2nd Edition
Std 610 11th Edition Std 671 4rd Edition
Std 611 5th Edition Std 672 4rd Edition
Std 613 5th Edition Std 674 3rd Edition
Std 614 5th Edition Std 675 2nd Edition
Std 616 5th Edition Std 676 3rd Edition
Std 617 7th Edition Std 677 3rd Edition
Std 618 5th Edition Std 682 3rd Edition
Std 619 5th Edition Std 685 2nd Edition

Mechanical Equipment Residual Unbalance Worksheets

Electronic versions of the residual unbalance worksheets that appear in mechanical equipment standards (Excel) along with instructions (Word).

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STORAGE TANKS

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 API 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. Includes 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. Pages: 25

January 2003 | Executive Summary | Price: $65.00
Appendix A—Literature Review | Price $127.00

You may access Std 620 in a read-only platform: publications.api.org

Std 620 Design and Construction of Large, Welded, Low-Pressure Storage Tanks

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 that would otherwise be provided by this standard. Pages: 277

You may access Std 620 in a read-only platform: publications.api.org

Std 625 Tank Systems for Refrigerated Liquefied Gas Storage

Covers low pressure, aboveground, vertical, and cylindrical tank systems storing liquefied gases requiring refrigeration. This standard provides general requirements on responsibilities, selection of storage concept, performance criteria, accessories/appurtenances, quality assurance, insulation, and commissioning of tank systems.

This standard covers tank systems having a storage capacity of 800 m³ (5000 bbls) and larger. Stored product shall be liquids that are in a gaseous state at ambient temperature and pressure and require refrigeration to less than 5 °C (40 °F) to maintain a liquid phase. Tank systems with a minimum...
design temperature of −198 °C (−325 °F), a maximum design internal pressure of 50 kPa (7 psig), and a maximum design uniform external pressure of 1.75 kPa (0.25 psig) are covered.

The tank system configurations covered consist of a primary liquid and vapor containment constructed of metal, concrete, or a metal/concrete combination, and when required, a secondary liquid containment. Metallic container materials, design, fabrication, inspection, examination, and testing are covered in Std 620, Appendix Q or Appendix R. The applicable appendix of Std 620 depends on the design metal temperature and the applicable temperature ranges given in these appendices. Pages: 59

1st Edition | August 2010 | Product Number: C62501 | Price: $232.00

Std 650 Welded Tanks for Oil Storage
(includes Errata 1 dated July 2013)

Establishes minimum requirements for material, design, fabrication, erection, and testing for vertical, cylindrical, aboveground, closed- and open-top welded 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 nonrefrigerated service that have a maximum design temperature of 93 °C (200 °F) or less. Pages: 498

12th Edition | March 2013 | Product Number: C65012 | Price: $475.00
You may access Std 650 in a read-only platform: publications.api.org

RP 651 Cathodic Protection of Aboveground Storage Tanks
(ANSI/API RP 651)

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 document 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: $106.00

RP 651 Cathodic Protection of Aboveground Storage Tanks—Chinese
Chinese translation of RP 651.

3rd Edition | January 2007 | Product Number: C65103C | Price: $75.00

RP 652 Lining of Aboveground Petroleum Storage Tank Bottoms
(ANSI/API RP 652)

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 apply to other services. This document 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: $117.00
You may access RP 652 in a read-only platform: publications.api.org
PRESSURE-RELIEVING SYSTEMS FOR REFINERY SERVICE

Std 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 kPa) 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 Std 2000 and pressure vessels used for the transportation of products in bulk or shipping containers are not within the scope of this standard. See Std 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: $249.00

Std 521
Guide for 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 facilities, and oil and gas production facilities. This document 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 document 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 document is intended to supplement the practices set forth in RP 5201 or ISO 4126 for establishing a basis of design. Pages: 192

Product Number: C52025 | Price: $171.00

Std 521/ISO 23251:2006
Guide for Pressure-Relieving and Depressuring Systems

Includes Errata 1 dated June 2007 and Addendum 1 dated May 2008

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 facilities, and oil and gas production facilities. This document 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 document 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 document is intended to supplement the practices set forth in RP 5201 or ISO 4126 for establishing a basis of design. Pages: 192


RP 520, Part 2
Sizing, Selection, and Installation of Pressure-Relieving Devices in Refineries—Part 2, Installation

Covers the methods of installation for pressure relief devices for equipment that has a maximum allowable working pressure of 15 psig (103 kPa) 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

Product Number: C52025 | Price: $171.00

Std 527
Seat Tightness of Pressure Relief Valves

(ANSI/API Std 527)

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

Product Number: C52700 | Price: $65.00

Std 527 *
Seat Tightness of Pressure Relief Valves—Russian

Russian translation of Std 527.

3rd Edition | July 1991 | Product Number: C52700R | Price: $52.00

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 document 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: $134.00

RP 576 *
Inspection of Pressure-Relieving Devices—Chinese

Chinese translation of RP 576.

3rd Edition | November 2009 | Product Number: C57603C | Price: $94.00

Std 2000
Venting Atmospheric and Low-Pressure Storage Tanks

(ANSI/API Std 2000)

Covers the normal and emergency vapor 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 1034 kPa (15 psig). Discussed in this document 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 document is applied to other liquids. This document does not apply to external floating-roof tanks.

This publication is not applicable to external floating-roof tanks.
The envelope of a piping system is consistent with the selected or specified toxic or hazardous liquids or vapors. This recommended practice (RP) construction materials to minimize the potential for catastrophic release of these materials. Carbon steel components specified in new or existing piping systems are not specifically covered under the scope of this document unless minor/trace alloying elements are critical to component corrosion resistance or similar degradation. Pages: 13

Piping System Component and Valve Standards

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 fiber reinforced plastic 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

API 570 *
Piping Inspection Code: In-Service Inspection, Rating, Repair, and Alteration of Piping System—Chinese
Chinese translation of API 570.
3rd Edition | November 2009 | Product Number: C57003 | Price: $134.00

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 document 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 inspections of specialty items, including instrumentation and control valves. Pages: 88

RP 574 *
Inspection Practices for Piping System Components—Chinese
Chinese translation of RP 574.
3rd Edition | November 2009 | Product Number: C57403 | Price: $136.00

RP 578 *
Material Verification Program for New and Existing Alloy Piping Systems
Provides the guidelines for material control and material verification programs on ferrous and nonferrous alloys during the construction, installation, maintenance, and inspection of new and existing process piping systems covered by the ASME B31.3 and API 570 piping codes. This RP applies to metallic alloy materials purchased for use either directly 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 specifically covered under the scope of this document unless minor/trace alloying elements are critical to component corrosion resistance or similar degradation. Pages: 21

RP 578 *
Material Verification Program for New and Existing Alloy Piping Systems—Russian
Russian translation of RP 578.
2nd Edition | March 2010 | Product Number: C57802R | Price: $91.00

RP 591
Process Valve Qualification Procedure
Provides recommendations for evaluation of a manufacturer's capability to provide new valves manufactured in accordance with the applicable API standards. Qualification of valves under this recommended practice (RP) is “manufacturing facility specific” and does not cover valves manufactured by other manufacturing facilities, whether owned by the same manufacturer or a third party. Fugitive emissions testing is outside the scope of this RP. Pages: 16

RP 591 *
Process Valve Qualification Procedure—Russian
Russian translation of RP 591.

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 two types of check valves:
- Type “A” check valves are short face-to-face and can be: wafer, lug, or double flanged; single plate or dual plate; gray iron, ductile iron, steel, nickel alloy, or other alloy designed for installation between Classes 125 and 250 cast iron flanges as specified in ASME B16.1. Between Classes 150 and 300 ductile iron flanges as specified in ASME B16.42, between Classes 150 and 2500 steel flanges as specified in ASME B16.5, and between Classes 150 and 600 steel pipeline flanges as specified in MSS SP-44 or steel flanges as specified in ASME B16.47.
- Type “B” bolted cover swing check valves are long face-to-face as defined in 5.1.2 and can be: flanged or butt-welding. Ends shall be specified in ASME B16.6; or ends shall be butt-welding as specified in ASME B16.25. Pages: 21

7th Edition | September 2010 | Effective Date: March 1, 2011
Product Number: C59407 | Price: $106.00

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Steel Gate, Globe, and Check Valves for Sizes DN 100 and Smaller

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 and
- 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, in sizes 1/4 NPS 4 (8 DN 100) and pressure designations including Class 800;
- inside screw with rising stems, 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 150 and union nut for Classes 800;
- standard and full-bore body seat openings;
- materials, as specified; and
- 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 B16.201 and 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: April 1, 2010
Product Number: C60209 | Price: $110.00

Std 602 *
Steel Gate, Globe, and Check Valves for Sizes DN 100 and Smaller for the Petroleum and Natural Gas Industries—Chinese

Chinese translation of Std 602.

9th Edition | October 2009 | Product Number: C60209C | Price: $77.00

Std 602 *
Steel Gate, Globe, and Check Valves for Sizes DN 100 and Smaller for the Petroleum and Natural Gas Industries—Russian

Russian translation of Std 602.

9th Edition | October 2009 | Product Number: C60209R | Price: $88.00

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 valves for use in process piping applications. Covered are requirements for outside-screw-and-yoke valves with rising stems, nonrising hand-wheels, bolted bonnets, and various types of gate configurations. Pages: 19

8th Edition | February 2013 | Product Number: C60308 | Price: $80.00

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Butterfly Valves: Double-Flanged, Lug- and Wafer-Type

This standard covers design, materials, face-to-face dimensions, pressure-containing capability, and the fire testing of such actuators is outside the scope of this standard. Pages: 14

6th Edition | September 2010 | Product Number: C60706 | Price: $84.00

Std 608 ●
Metal Ball Valves—Flanged, Threaded, and Welding Ends

This standard establishes requirements for ball valves that are considered by this standard include temperature, pressure, thermal cycling, and corrosion, and other service conditions would indicate a need for heavy wall sections and large stem diameters. This standard sets forth the requirements for the following globe valve features:

- bolted bonnet,
- outside screw and yoke,
- rotating rising stems and nonrotating rising stems,
- rising handwheels and nonrising handwheels,
- conventional, y-pattern, right-angle,
- stop-check (nonreturn type globe valves in which the disc may be positioned against the seat by action of the stem but is free to rise as a

This publication is a new entry in this catalog.

This publication is related to an API licensing, certification, or accreditation program.
Check valve due to flow from under the disc, when the stem is in a full or partially open position.
- plug, narrow, conical, ball, or guided disc,
- metallic seating surfaces,
- flanged or butt-welding ends.

It covers only the nominal pipe sizes NPS:
- 50, 65, 80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600; applies for pressure class designations:
- 150, 300, 600, 900, 1500, 2500.

You may access RP 505 in a read-only platform: publications.api.org

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)

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 apply to the classification of locations for both temporarily and permanently installed 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: August 2013
Product Number: C50501 | Price: $203.00
You may access RP 505 in a read-only platform: publications.api.org

You may access RP 505 in a read-only platform: publications.api.org

RP 500
Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2

Includes Errata 1 dated January 2014

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 apply 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: 146

3rd Edition | December 2012 | Product Number: C50003K | Price: $279.00
You may access RP 500 in a read-only platform: publications.api.org

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

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 apply to the classification of locations for both temporarily and permanently installed 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: August 2013
Product Number: C50501 | Price: $203.00
You may access RP 505 in a read-only platform: publications.api.org

You may access RP 505 in a read-only platform: publications.api.org

RP 500
Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2

Includes Errata 1 dated January 2014

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 apply 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: 146

3rd Edition | December 2012 | Product Number: C50003K | Price: $224.00

Online Orders: www.global.ihs.com

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

Product Number: C54004 | Price: $188.00

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: $171.00

RP 545
Lightning Protection for Aboveground Storage Tanks

Replaces the requirements of RP 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: $101.00

TR 545-A
Verification of Lightning Protection Requirements for Above Ground Hydrocarbon Storage Tanks

Collates a number of research reports investigating the lightning phenomena and the adequacy of lightning protection requirements on above ground hydrocarbon storage tanks. These are as follows:
- review of lightning phenomena and the interaction with above ground storage tanks,
- review of tank base earthing and test current recommendations,
- lightning tests to tank shell/shunt samples,
- visits to oil refinery A and B,
- review of burn-through and hot-spot effects on metallic tank skins from lightning strikes,
- lightning simulation testing to determine the required characteristics for roof bonding cables on external floating roof above ground storage tanks, and
- investigative tests on the lightning protection of submerged shunts with parallel roof bonding cables. Pages: 193

1st Edition | October 2009 | Product Number: CLP2009 | Price: $134.00

Std 546
Brushless Synchronous Machines 500 kVA and Larger

Covers the minimum requirements for form- 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: 191

3rd Edition | September 2008 | Product Number: C54603 | Price: $208.00

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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 RPM 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, and
- are not induction generators. Pages: 30

1st Edition | January 2005 | Product Number: C54701 | Price: $94.00

Std 530/ISO 13704:2007
Calculation of Heater-Tube Thickness in Petroleum Refineries
(includes Errata 1 dated January 2009)

Specifies the requirements and gives recommendations for the procedures and design criteria used for calculating the required wall thickness of new tubes and associated component fittings for petroleum refinery heaters. 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 standard does not give recommendations for tube retirement thickness.

This edition of API Std 530 is the identical national adoption of ISO 13704:2007. Pages: 146


RP 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

Product Number: C53402 | Price: $95.00

RP 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 document 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. Pages: 76

2nd Edition | January 2006 | 2-Year Extension: November 2010
Product Number: C53502 | Price: $117.00

RP 536
Post Combustion NOx Control for Equipment in General Refinery Services

Covers the mechanical description, operation, maintenance, and test procedures of post-combustion NOx control equipment. It covers the selective non-catalytic reduction and selective catalytic reduction methods of post-combustion NOx reduction. It does not cover reduced NOx formation through burner design techniques such as external flue gas recirculation. Pages: 41

2nd Edition | December 2006 | Reaffirmed: September 2013
Product Number: C53602 | Price: $97.00

Std 537/ISO 25457:2008
Flare Details for General Refinery and Petrochemical Service

Specifies requirements and provides guidance for the selection, design, specification, operation, and maintenance of flares and related combustion and mechanical components used in pressure-relieving and vapour-depressurizing systems for petroleum, petrochemical, and natural gas industries. Although this standard is primarily intended for new flares and related equipment, it is also possible to use it to evaluate existing flare facilities.

This edition of API Std 537 is the identical national adoption of ISO 25457:2008. Pages: 156

Product Number: C53702 | Price: $217.00

Std 560/ISO 13705:2006
Fired Heaters for General Refinery Services (ANSI/API Std 560)

Specifies requirements and provides guidance 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 Std 560 is an identical national adoption of ISO 13705:2006. Pages: 266

4th Edition | August 2007 | Product Number: CX56004 | Price: $302.00

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 that 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: 109

3rd Edition | October 2013 | Product Number: C57303 | Price: $150.00

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Refining

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Std 660/ISO 16812:2007
Shell-and-Tube Heat Exchangers
(ANSI/API Std 660)

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 standard is applicable to the following types of shell-and-tube heat exchangers: heaters, condensers, coolers, and reboilers. It is not applicable to vacuum-operated steam surface condensers and feedwater heaters.

This edition of API Std 660 is the identical national adoption of ISO 16812:2007. Pages: 41
Product Number: CX66008 | Price: $165.00

Std 661
Petroleum, Petrochemical, and Natural Gas Industries—Air-Cooled Heat Exchangers

Gives requirements and recommendations for the design, materials, fabrication, inspection, testing, and preparation for shipment of air-cooled heat exchangers for use in the petroleum, petrochemical, and natural gas industries. This standard is applicable to air-cooled heat exchangers with horizontal bundles, but the basic concepts can also be applied to other configurations. Pages: 147
7th Edition | July 2013 | Product Number: C66107 | Price: $250.00

Std 662, Part 1/ISO 15547-1:2005
Plate Heat Exchangers for General Refinery Services, Part 1—Plate-and-Frame Heat Exchangers
(ANSI/API Std 662, Part 1)

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 API Std 662-1 is an identical national adoption of ISO 15547-1:2005. Pages: 34
Product Number: CX662101 | Price: $132.00

Std 662, Part 2/ISO 15547-2:2005
Plate Heat Exchangers for General Refinery Services, Part 2—Brazed Aluminum Plate-Fin Heat Exchangers
(ANSI/API Std 662, Part 2)

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 API Std 662-2 is an identical national adoption of ISO 15547-2:2005. Pages: 34
Product Number: CX662201 | Price: $132.00

INSTRUMENTATION AND CONTROL SYSTEMS

RP 551
Process Measurement Instrumentation
Provides procedures for the installation of the more generally used measuring and control instruments and related accessories. Pages: 58
Product Number: C55100 | Price: $125.00

RP 551 *
Process Measurement Instrumentation—Russian
Russian translation of RP 551.
1st Edition | May 1993 | Product Number: C55100R | Price: $100.00

RP 552
Transmission Systems
Reviews the recommended practices for the installation of electronic and pneumatic measurement and control-signal transmission systems. It does not discuss leased wire, radio, and telemetering transmission. Pages: 39
Product Number: C55201 | Price: $109.00

RP 553
Refinery Valves and Accessories for Control and Safety Instrumented Systems
Addresses the special needs of automated valves in refinery services. The knowledge and experience of the industry has been captured to provide proven solutions to well-known problems.

This document provides recommended criteria for the selection, specification, and application of valve (i.e. double-acting and spring-return) and diaphragm-actuated (spring-return) control valves. Control valve design considerations are outlined such as valve selection, material selection, flow characteristic evaluation, and valve accessories. It also discusses control valve sizing, fugitive emissions, and consideration of the effects of flashing, cavitation, and noise.

Recommendations for emergency block and vent valves, on/off valves intended for safety instrumented systems, and special design valves for refinery services, such as fluid catalytic cracking unit slide valves and vapor depressurizing systems, are also included in this recommended practice. Pages: 109
2nd Edition | October 2012 | Product Number: C55302 | Price: $145.00

RP 554, Part 1
Addresses the processes required to successfully implement Process Control Systems for refinery and petrochemical services. The major topic addressed in Part 1 is the basic functions that a Process Control System may need to perform and recommended methodologies for determining the functional and integration requirements for a particular application. Pages: 32
2nd Edition | July 2007 | Product Number: C55402 | Price: $139.00

RP 554, Part 1 *
2nd Edition | July 2007 | Product Number: C55402R | Price: $112.00

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RP 554, Part 2
Process Control Systems, Part 2—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 | Product Number: C554201 | Price: $139.00

RP 554, Part 2 *
Process Control Systems, Part 2—Control System Design—Russian
Russian translation of RP 554, Part 2.
1st Edition | October 2008 | Product Number: C554201R | Price: $112.00

RP 554, Part 3
Process Control Systems, Part 3—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 | Product Number: C554301 | Price: $107.00

API 555 
Process Analyzers
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 monitoring and controlling product quality, implementing advanced control strategies in improving process operations, enhancing area safety, and continuous emission monitoring and environmental measurement of air and water quality. Pages: 314
3rd Edition | June 2013 | Product Number: C55503 | Price: $190.00

RP 556
Instrumentation, Control, and Protective Systems for Gas Fired Heaters
Provides guidelines that specifically apply to instrument, control, and protective system installations for gas fired heaters in petroleum production, refineries, petrochemical, and chemical plants. Includes primary measuring and actuating instruments, controls, alarms, and protective systems as they apply to fired heaters. Not covered in this document are the following: oil fired and combination fired heaters; water tube boilers that consist of single or multiple burners and are designed for utility operation or where the primary purpose is steam generation; fired steam generators used to recover heat from combustion turbines; oven and furnaces used for the primary purpose of incineration, oxidation, reduction, or destruction of the process medium; water bath or oil bath indirect fired heaters; CO boilers, pyrolysis furnaces, and other specialty heaters. Pages: 66
2nd Edition | April 2011 | Product Number: C55602 | Price: $152.00

RP 556 *
Instrumentation, Control, and Protective Systems for Gas Fired Heaters—Russian
Russian translation of RP 556.
2nd Edition | April 2011 | Product Number: C55602R | Price: $122.00

Phone Orders: 303-397-7956 (Local and International)

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: 45
2nd Edition | October 2013 | Product Number: C55702 | Price: $110.00

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 refining 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.
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TECHNICAL DATA BOOK PETROLEUM REFINING: RELATED ITEMS

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

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: $211.00

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CHARACTERIZATION AND THERMODYNAMICS

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, Naphthenalene, 1978
Publ 708, Anthracene 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 Acidine, 1981
Publ 717, Thiophene, 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, Dibenzo furan, and Benzonanthofurans, 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

Thermodynamic Properties and Characterization of Petroleum Fractions

February 1988

MATERIALS ENGINEERING PUBLICATIONS

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; and 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: $123.00

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 API 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. Includes 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: $65.00
Appendix A–Literature Review | Price $127.00

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 mechanisms. Each write-up consists of a general description of the damage, susceptible materials, 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: 362

2nd Edition | April 2011 | Product Number: C57102 | Price: $329.00

RP 571 Chinese

Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Chinese

Chinese translation of RP 571.

2nd Edition | April 2011 | Product Number: C57102C | Price: $231.00

RP 582 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; and
- 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 Boiler and Pressure Vessel Code, 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: $124.00

This publication is a new entry in this catalog. ◆ This publication is related to an API licensing, certification, or accreditation program.
incidents illustrate the current need to better understand the corrosion of equipment replacements, unplanned outages, and catastrophic events. Within the refining industry, making it difficult to inspect for deterioration and to accurately predict and control corrosion have had limited success due to the interdependence of the systems. It is necessary to improve the reliability, safety, and environmental impact associated with them. Past attempts to define generic optimum practices to manage corrosion and fouling in the wet sections of reactor effluent systems have an air cooler; however, some systems utilize only shell and tube heat exchangers. Reactor effluent systems are prone to fouling and corrosion by ammonium bisulfide and ammonium chloride salts.

An understanding of all variables impacting corrosion and fouling in these systems is necessary to improve the reliability, safety, and environmental impact associated with them. Past attempts to define generic optimum equipment design and acceptable operating variables to minimize fouling and corrosion have had limited success due to the interdependence of the variables. Corrosion can occur at high rates and be extremely localized, making it difficult to inspect for deterioration and to accurately predict remaining life of equipment and piping. 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. Pages: 64

**2nd Edition | September 2002 | Product Number: C932A0 | Price: $151.00**

**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 Bull 932-B. Pages: 44

**2nd Edition | March 2012 | Product Number: C932B02 | Price: $257.00**

**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—Russian

Covers many of the “lean,” “standard,” and “super” grades of duplex stainless steels (DSS) most commonly used within refineries. The definitions of these terms have not been firmly established by the industry and vary between literature references and materials suppliers. Table 1 shows how the various grades are being classified into “families” for the purposes of this report. The UNS numbers of the standard grades being used for corrosive refining services include S31803 and S32205, while the super grades include S31260, S32520, S32550, S32750, S32760, S32974, and S32977. The grades which are labeled as “semi-lean” include S32304 and UNS S32300, have either lower Cr or Mo than the standard grades, and are used in some process services that are less aggressive. These alloys and lean duplexes, such as S32101, have also been used for storage tanks and structural applications primarily for their higher strength compared to carbon steel. It is observed that new DSS alloys are being introduced and are likely to continue to be introduced. These new grades can be reasonably placed in the context of this discussion based on their composition.

The products forms within the scope are tubing, plate, sheet, forgings, pipe, and fittings for piping, vessel, exchanger, and tank applications. The use of DSS for tanks is addressed by Std 650, Appendix X. Later revisions of this report may consider expanding the scope to include castings and other product forms for pumps, valves, and other applications. Use of DSS as a cladding is also not included within the scope of this document. Pages: 44


**RP 934-C**

Materials and Fabrication of 1 1/4Cr-1/2Mo Steel Heavy Wall Pressure Vessels for High Pressure Hydrogen Service Operating at or Below 825 °F (441 °C)

Covers many of the “lean,” “standard,” and “super” grades of duplex stainless steels (DSS) most commonly used within refineries. The definitions of these terms have not been firmly established by the industry and vary between literature references and materials suppliers. Table 1 shows how the various grades are being classified into “families” for the purposes of this report. The UNS numbers of the standard grades being used for corrosive refining services include S31803 and S32205, while the super grades include S31260, S32520, S32550, S32750, S32760, S32974, and S32977. The grades which are labeled as “semi-lean” include S32304 and UNS S32300, have either lower Cr or Mo than the standard grades, and are used in some process services that are less aggressive. These alloys and lean duplexes, such as S32101, have also been used for storage tanks and structural applications primarily for their higher strength compared to carbon steel. It is observed that new DSS alloys are being introduced and are likely to continue to be introduced. These new grades can be reasonably placed in the context of this discussion based on their composition.

The products forms within the scope are tubing, plate, sheet, forgings, pipe, and fittings for piping, vessel, exchanger, and tank applications. The use of DSS for tanks is addressed by Std 650, Appendix X. Later revisions of this report may consider expanding the scope to include castings and other product forms for pumps, valves, and other applications. Use of DSS as a cladding is also not included within the scope of this document. Pages: 44

**2nd Edition | May 2008 | 2-Year Extension: November 2013 | Product Number: C934C01R | Price: $86.00**
TR 934-D
Technical Report on the Materials and Fabrication Issues of 1\1/4\Cr-1/2\Mo and 1Cr-1/2\Mo Steel Pressure Vessels

Numerous 1\1/4\Cr-1/2\Mo and 1Cr-1/2\Mo vessels have been constructed and successfully used in various applications in petroleum industry and in other types of service applications. These vessels have been constructed to the requirements of the ASME Boiler and Pressure Vessel Code, Section VIII, Divisions 1 and 2 and to various international pressure vessel codes and standards. The 1\1/4\Cr-1/2\Mo and 1Cr-1/2\Mo vessels are typically used in service conditions (e.g. high temperature and/or high pressure hydrogen), which require heavy walls and cause in service deterioration. As such, the steels are subject to special requirements, such as notch toughness, elevated temperature tensile properties, hardness, fabrication heat treatments, etc., which may limit the maximum thickness to be able to meet the desired properties. Corrosion protection by stainless steel weld overlay or cladding may also be required. Pages: 56

1st Edition | September 2010 | Product Number: C934D01 | Price: $135.00

RP 934-E
Materials and Fabrication of 1\1/4\Cr-1/2\Mo Steel Pressure Vessels for Service Above 825 °F (440 °C)

Includes materials and fabrication requirements for new 1\1/4\Cr-1/2\Mo steel and 1Cr-1/2\Mo pressure vessels and heat exchangers for high temperature service. It applies to vessels that are designed, fabricated, certified, and documented in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1. This document may also be used as a resource when planning to modify existing pressure vessels. The interior surfaces of these pressure vessels may have an austenitic stainless steel, ferritic stainless steel, or nickel alloy weld overlay or cladding to provide additional corrosion resistance. This document is applicable to wall (shell) thicknesses from 1 in. (25 mm) to 4 in. (100 mm). Integrally reinforced nozzles, flanges, tube sheets, bolted channel covers, etc. can be greater than 4 in. This alloy if these properties can be met or if the equipment is designed with stresses below the threshold for brittle fracture. Although outside of the scope, this document can be used as a resource for vessels down to 0.5 in. (12.7 mm) shell thickness with changes defined by the Purchaser. Pages: 26

1st Edition | August 2010 | Product Number: C934E01 | Price: $107.00

RP 934-E *
Materials and Fabrication of 1\1/4\Cr-1/2\Mo Steel Pressure Vessels for Service Above 825 °F (440 °C)–Russian

Russian translation of RP 934-E.

1st Edition | August 2010 | Product Number: C934EO1R | Price: $86.00

Publ 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: $60.00

Publ 937-A
Study to Establish Relations for the Relative Strength of API 650 Cone Roof, Roof-to-Shell and Shell-to-Bottom Joints

Investigates the relative strengths of the roof-to-shell and shell-to-bottom joints, with the goal of providing suggestions for fragile roof design criteria applicable to smaller tanks. Pages: 68

1st Edition | August 2005 | Product Number: C937A0 | Price: $122.00

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 metal 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: $109.00

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 (DSSs) 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: 44

2nd Edition | April 2011 | Product Number: C938C02 | Price: $163.00

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TR 939-A
Research Report on Characterization and Monitoring of Cracking in Wet H₂S 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: $156.00

Publ 939-B
Repair and Remediation Strategies for Equipment Operating in Wet H₂S Service

Presents data relative to the fabrication requirements for 2-1/4 Cr 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 document 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: C93980 | Price: $171.00

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 H₂S 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

TR 939-D
Stress Corrosion Cracking of Carbon Steel in Fuel Grade Ethanol—Review, Experience Survey, Field Monitoring, and Laboratory Testing (includes Addendum 1 dated October 2013)

Addresses stress corrosion cracking in carbon steel equipment used in distribution, transportation, storage, and blending of denatured fuel ethanol. API, with assistance from the Renewable Fuels Association, 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, and information on mitigation and prevention. Pages: 172
2nd Edition | May 2007 | Product Number: C939D0 | Price: $160.00

Bull 939-F
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: 42
2nd Edition | August 2013 | Product Number: C939E02 | Price: $160.00

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 recommended practice (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 hydrogen-containing 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

TR 941
The Technical Basis Document for API RP 941

Even before the 1st Edition of Publ 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. Pages: 301
1st Edition | September 2008 | Product Number: C09410 | Price: $198.00

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

Publ 959
Characterization Study of Temper Embrittlement of Chromium-Molybdenum Steels

1st Edition | January 1982 | Product Number: C95900 | Price: $157.00

This publication is a new entry in this catalog.

This publication is related to an API licensing, certification, or accreditation program.
This edition of RP 752 does not cover portable buildings. Portable buildings are now covered by RP 753:2007. It is recognized, however, that portable buildings specifically designed for significant blast load represent a potential area of overlap between RP 753 and RP 752. In accordance with 1.3 of this document:

“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 portable buildings are covered by API RP 753.” Pages: 27

3rd Edition | December 2009 | Product Number: K75203 | Price: $141.00
You may access RP 752 in a read-only platform: publications.api.org

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; and

• 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: $141.00
You may access RP 753 in a read-only platform: publications.api.org

RP 754
Process Safety Performance Indicators for the Refining and Petrochemical Industries (ANSI/API RP 754)

As a result of the U.S. Chemical Safety and Hazard Investigation Board (CSB) investigation of the 2005 BP Texas City incident, the CSB issued several recommendations including the development of an American National Standards Institute standard that creates performance indicators for process safety in the refining and petrochemical industries. Ensure that the standard identifies leading and lagging indicators for nationwide public reporting as well as indicators for use at individual facilities. Include methods for the development and use of the performance indicators.

Identifies leading and lagging process safety indicators that are useful for driving performance improvement. The indicators are divided into four tiers that represent a leading and lagging continuum. Tier 1 is the most lagging and Tier 4 is the most leading. Tiers 1 and 2 are suitable for nationwide public reporting and Tiers 3 and 4 are intended for internal use at individual sites.

Developed for the refining and petrochemical industries, but may also be applicable to other industries with operating systems and processes where loss of containment has the potential to cause harm. Applicability is not limited to those facilities covered by the OSHA Process Safety Management Standard, 29 CFR 1910.119 or similar national and international regulations.

Pages: 39

You may access RP 754 in a read-only platform: publications.api.org
These publications are related to process safety management and energy efficiency in the refining and petrochemical industries.
**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 refiners, 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: $65.00

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 five principal statutes that apply to refinery operations. Pages: 145

1st Edition | September 1988 | Product Number: C80000 | Price: $92.00

**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 | November 2007 | Product Number: TSTP01 | Price: $90.00

Security Guidelines for the Petroleum Industry

API's 3rd Edition of this document 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: 58

3rd Edition | April 2005 | Product Number: OS0002 | Price: $191.00

You may access this document in a read-only platform: publications.api.org

Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

Prepared by a Security Risk Assessment (SRA) Committee of API to assist the petroleum and petrochemical industries in understanding security risk assessment and in conducting SRAs. The standard describes the recommended approach for assessing security risk widely applicable to the types of facilities operated by the industry and the security issues the industry faces. The standard is intended for those responsible for conducting security risk assessments and managing security at these facilities. The method described in this standard is widely applicable to a full spectrum of security issues from theft to insider sabotage to terrorism. The API SRA Methodology was developed for the petroleum and petrochemical industry for a broad variety of both fixed and mobile applications. This recommended practice describes a single methodology, rather than a general framework for SRAs, but the methodology is flexible and adaptable to the needs of the user. This methodology constitutes one approach for assessing security vulnerabilities at petroleum and petrochemical industry facilities. However, there are other risk assessment techniques and methods available to industry, all of which share common risk assessment elements. Pages: 113

1st Edition | May 2013 | Product Number: K78001 | Price: $190.00

You may access this in a read-only platform: publications.api.org
Nobody remembers who won second place. Especially in this business. And especially when it comes to data. That’s why you need to subscribe to API’s Weekly Statistical Bulletin. It comes out a full 18 hours before any other data hits the streets.

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If you have any questions or comments regarding API standards, please visit www.api.org/standards.

UPSTREAM SAFETY STANDARDS

API HF1
Hydraulic Fracturing Operations—Well Construction and Integrity Guidelines

Provides guidance and highlights 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: $42.00
You may access API HF1 in a read-only platform: publications.api.org

API HF2
Water Management Associated with Hydraulic Fracturing

Identifies and describes many of the current industry best practices used to minimize environmental and societal impacts associated with the acquisition, use, management, treatment, and disposal of water and other fluids associated with the process of hydraulic fracturing. While this document focuses primarily on issues associated with hydraulic fracturing pursued in deep shale gas development, it also describes the important distinctions related to hydraulic fracturing in other applications.

Moreover, this guidance document focuses on areas associated with the water used for purposes of hydraulic fracturing and does not address other water management issues and considerations associated with oil and gas exploration, drilling, and production. These topics will be addressed in future API documents. Pages: 40

1st Edition | June 2010 | Product Number: GHF201 | Price: $42.00
You may access API HF2 in a read-only platform: publications.api.org

API HF3
Practices for Mitigating Surface Impacts Associated with Hydraulic Fracturing

Identifies and describes practices currently used in the oil and natural gas industry to minimize surface environmental impacts-potential impacts on surface water, soils, wildlife, other surface ecosystems, and nearby communities-associated with hydraulic fracturing operations. While this document focuses primarily on issues associated with operations in deep shale gas developments, it also describes the important distinctions related to hydraulic fracturing in other applications. Pages: 18

1st Edition | January 2011 | Product Number: GHF301 | Price: 42.00

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

Product Number: G49003 | Price: $88.00
You may access RP 49 in a read-only platform: publications.api.org

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

Kazakh translation of RP 49.

2nd Edition | May 2001 | Product Number: G04902K | Price: $71.00

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 is included. Annex A provides guidance for a company to consider as a “good neighbor.” Pages: 35

1st Edition | July 2008 | Product Number: G51R01 | Price: $52.00
You may access RP 51R in a read-only platform: publications.api.org

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

Product Number: G54003 | Price: $125.00
You may access RP 54 in a read-only platform: publications.api.org

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

Kazakh translation of RP 54.

3rd Edition | August 1999 | Product Number: G54003K | Price: $100.00
RP 55
Recommended Practices for 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
Product Number: G55002 | Price: $115.00
You may access RP 55 in a read-only platform: publications.api.org

Std 65-2
Isolating Potential Flow Zones During Well Construction
Contains best practices for zone isolation in wells to prevent annular pressure and/or flow through or past pressure-containment barriers that are installed and verified during well construction. Well construction practices that may affect barrier sealing performance are mentioned along with methods to help ensure positive effects or to minimize any negative ones. The objectives of this guideline are two-fold. The first is to help prevent and/or control flows just prior to, during, and after cementing operations to install or “set” casing and liner pipe strings in wells. The second objective is to help prevent sustained casing pressure. The guidance from this document covers recommendations for pressure-containment barrier design and installation and well construction practices that affect the zone isolation process to prevent or mitigate annular fluid flow or pressure. Pages: 83
2nd Edition | December 2010 | Product Number: G65202 | Price: $130.00
You may access Std 65-2 in a read-only platform: publications.api.org

RP 67
Recommended Practice for Oilfield Explosives Safety
Applies to explosives used in oil and gas well operations, more specifically, explosives used inside the wellbore. 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, sideway 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: G06702 | Price: $85.00
You may access RP 67 in a read-only platform: publications.api.org

RP 67 "K" Recommended Practice for Oilfield Explosives Safety—Kazakh
Kazakh translation of RP 67.
2nd Edition | May 2007 | Product Number: G09308K | Price: $68.00

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
Product Number: G74001 | Price: $61.00
You may access RP 74 in a read-only platform: publications.api.org

RP 75
Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities
Provides guidance for use in preparing safety and environmental management programs 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, start-up, operation, inspection, and maintenance of new, existing, and modified facilities Pages: 41
Product Number: G07503 | Price: $89.00
You may access RP 75 in a read-only platform at publications.api.org

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
Provides 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 | November 2007 | Product Number: G75L01 | Price: $34.00
You may access RP 75L in a read-only platform: publications.api.org

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 | November 2007 | Product Number: G07602 | Price: $57.00
You may access RP 76 in a read-only platform: publications.api.org

MULTI-SEGMENT PUBLICATIONS

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.

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: IOHF02 | Price: $149.00

This publication is a new entry in this catalog.

This publication is related to an API licensing, certification, or accreditation program.
Human Factors Tool for Existing Operations

Objectives of this tool include the following:
- provide a tool for operating crews to identify opportunities for latent conditions and human error;
- improve how process hazards analysis/hazard evaluation/rela-validation 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. Pages: 14

1st Edition | February 2006 | Product Number: IOHFO3 | Price: $62.00

RP 752
Management of Hazards Associated with Location of Process Plant Permanent 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 recommended practice (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.

Significant research and development of technology pertinent to building siting evaluations has been performed since the publication of the previous editions of RP 752. Examples of updated technology include prediction of blast damage to buildings, determination of occupant vulnerabilities, and estimates of event frequencies. Prior versions of RP 752 and the technical data included in them should not be used for building siting evaluations.

This edition of RP 752 does not cover portable buildings. Portable buildings are now covered by RP 753:2007. It is recognized, however, that portable buildings specifically designed for significant blast load represent a potential area of overlap between RP 753 and RP 752. In accordance with 1.3 of this document:

- 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: 27

3rd Edition | December 2009 | Product Number: K75203 | Price: $141.00
You may access RP 752 in a read-only platform: publications.api.org

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: $141.00
You may access RP 753 in a read-only platform: publications.api.org

RP 754
Process Safety Performance Indicators for the Refining and Petrochemical Industries

As a result of the U.S. Chemical Safety and Hazard Investigation Board (CSB) investigation of the 2005 BP Texas City incident, the CSB issued several recommendations including the development of an American National Standards Institute standard that creates performance indicators for process safety in the refining and petrochemical industries. Ensure that the site identifies leading and lagging indicators for nationwide public reporting as well as indicators for use at individual facilities. Include methods for the development and use of the performance indicators.

Identifies leading and lagging process safety indicators that are useful for driving performance improvement. The indicators are divided into four tiers that represent a leading and lagging continuum. Tier 1 is the most lagging and Tier 4 is the most leading. Tiers 1 and 2 are suitable for nationwide public reporting and Tiers 3 and 4 are intended for internal use at individual sites.

Developed for the refining and petrochemical industries, but may also be applicable to other industries with operating systems and processes where loss of containment has the potential to cause harm. Applicability is not limited to those facilities covered by the OSHA Process Safety Management Standard, 29 CFR 1910.119 or similar national and international regulations. Pages: 39

You may access RP 754 in a read-only platform: publications.api.org

RP 755
Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries

As a result of the U.S. Chemical Safety and Hazard Investigation Board (CSB) investigation of the 2005 BP Texas City incident, the CSB issued several recommendations including the development of an American National Standards Institute standard that develops Fatigue prevention guidelines for the refining and petrochemical industries that, at a minimum, limit hours and days of work and address shift work.

Provides guidance to all stakeholders (e.g. employees, managers, supervisors) on understanding, recognizing, and managing fatigue in the workplace. Owners and operators should establish policies and procedures to meet the purpose of this document.

Developed for refineries, petrochemical and chemical operations, natural gas liquefaction plants, and other facilities such as those covered by the OSHA Process Safety Management Standard, 29 CFR 1910.119. This document is intended to apply to a workforce that is commuting daily to a job location.

Applies to all employees working night shifts, rotating shifts, extended hours/day, or call outs involved in process safety sensitive actions. It should also be considered for others making process safety-sensitive decisions. On-site contractors involved in process safety sensitive actions shall have fatigue risk management systems equivalent to the criteria outlined in this document. Pages: 11

1st Edition | April 2010 | Product Number: K75501 | Price: $83.00
You may access RP 755 in a read-only platform: publications.api.org

This publication is a new entry in this catalog. This publication is related to an API licensing, certification, or accreditation program.
Safety and Fire Protection

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Publ 770

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: $76.00

Std 780
Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

Prepared by a Security Risk Assessment (SRA) Committee of API to assist the petroleum and petrochemical industries in understanding security risk assessment and in conducting SRAs. The standard describes the recommended approach for assessing security risk widely applicable to the types of facilities operated by the industry and the security issues the industry faces. The standard is intended for those responsible for conducting security risk assessments and managing security at these facilities. The method described in this standard is widely applicable to a full spectrum of security issues from theft to insider sabotage to terrorism. The API SRA Methodology was developed for the petroleum and petrochemical industry, for a broad variety of both fixed and mobile applications. This recommended practice describes a single methodology, rather than a general framework for SRAs, but the methodology is flexible and adaptable to the needs of the user. This methodology constitutes one approach for assessing security vulnerabilities at petroleum and petrochemical industry facilities. However, there are other risk assessment techniques and methods available to industry, all of which share common risk assessment elements. Pages: 113
1st Edition | May 2013 | Product Number: K78001 | Price: $190.00

RP 2001
Fire Protection in Refineries

Provides a better understanding of refinery fire protection and the steps needed to promote the safe storage, handling, and processing of petroleum and petroleum products in refineries. A basic premise of this standard is that fire prevention provides the fundamental foundation for fire protection. This document covers basic concepts of refinery fire prevention and 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, standards, or governmental requirements.

Hazards are situations or properties of materials with the inherent ability to cause harm. Flammability, toxicity, corrosivity, and stored electrical, chemical, or mechanical energy are hazards associated with various industrial materials or situations.

Risk requires exposure. A hot surface or material can cause thermal skin burns or a corrosive acid can cause chemical skin burns, but these can occur only if there is contact exposure to skin.

A person working at an elevated height has "stored energy" and a fall from a height can cause injury—but there is no risk unless a person is indeed working at heights and thus exposed to the hazard. There is no risk when there is no potential for exposure.

Determining the level of risk for any activity involves understanding and recognizing hazards, then estimating the probability and severity of exposure events that could lead to harm or damage and the resulting consequences. Principles relating hazards to the risk for people are valid for evaluating property or environmental risk. For instance, hydrocarbon vapors in a flammable mixture with air can ignite if exposed to a source of ignition resulting in a fire that could cause property damage as well as injure people. Hydrocarbons that will burn are hazardous materials—but one element of risk includes a flammable fuel-air mixture being exposed to an ignition source. Pages: 75
9th Edition | April 2012 | Product Number: C200109 | Price: $115.00
You may access RP 2001 in a read-only platform: publications.api.org

RP 2003
Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents

Provides 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 RP 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: $125.00
You may access RP 2003 in a read-only platform: publications.api.org

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 facilities 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
Product Number: K20097 | Price: $79.00
You may access RP 2009 in a read-only platform: publications.api.org

RP 2027
Ignition Hazards and Safe Working Practices for 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
Product Number: C20273 | Price: $74.00
You may access RP 2027 in a read-only platform: publications.api.org

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 propagation parameters are discussed including the distinction between arresting flames versus arresting detonations. Pages: 12
3rd Edition | February 2002 | Reaffirmed: December 2010
Product Number: K20283 | Price: $59.00
You may access RP 2028 in a read-only platform: publications.api.org
### 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

Product Number: K20303 | Price: $70.00
You may access RP 2030 in a read-only platform: publications.api.org

### RP 2201
**Safe Hot Tapping Practices in the Petroleum & 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

Product Number: K22015 | Price: $86.00
You may access RP 2201 in a read-only platform: publications.api.org

### 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 utilizing on atmospheric fixed-roof tanks. Pages: 4

3rd Edition | June 2000 | Reaffirmed: October 2010
Product Number: K22103 | Price: $65.00
You may access RP 2210 in a read-only platform: publications.api.org

### 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

3rd Edition | December 2003 | Reaffirmed: October 2010
Product Number: K22163 | Price: $59.00
You may access RP 2216 in a read-only platform: publications.api.org

### Std 2217A
**Guidelines for Safe 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 entry. This document 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.

3rd Edition | October 2011 | Product Number: K222003 | Price: $91.00
You may access Std 2217A in a read-only platform: publications.api.org

### RP 2218
**Fireproofing Practices in Petroleum and Petrochemical Processing Plants**

Provides guidance for selecting, applying, and maintaining fireproofing systems designed to limit the extent of fire-related property loss from pool fires in the petroleum and petrochemical industries. Where comparable hazards exist, and to the extent appropriate, it may be applied to other facilities that could experience similar severe fire exposure and potential losses. This document identifies fireproofing needs for petroleum and petrochemical plants specifically focusing on property loss protection for pool fires scenarios in on-shore processing plants. Pages: 60

3rd Edition | July 2013 | Product Number: K22183 | Price: $160.00
You may access Publ 2218 in a read-only platform: publications.api.org

### 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 document 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

Product Number: K22193 | Price: $112.00
You may access RP 2219 in a read-only platform: publications.api.org

### Std 2220
**Contractor Safety Performance Process**

The purpose of this standard is to assist owners and contractors in developing, improving, and maintaining their mutual safety programs. Widely diverse contractor functions and uses may include resident, non-resident, long-term, and short-term contractors. These have in common the need for effective safety programs to protect both owner and contractor personnel from workplace injury and illness, as well as from losses associated with incidents arising out of contractor work. This standard aims to help both owners and contractors improve the contractor’s safety performance while preserving the independent contractor relationship. It was developed for the petroleum and petrochemical industries and the firms that perform contract work for them. Contractors perform greatly varied work within the petroleum and petrochemical industries. Some perform construction and turnaround activities or drilling and well servicing; specialty contractors provide skills and services that are not typically found within an owner’s work force. Contractors may even provide services that augment the peak loads and skills of owners’ work forces, such as in the maintenance and operation of facilities. Since owner sites and contracted work are diverse, this standard may not be applicable to all operations at each company or to all contract work performed in those operations. As such, this publication may not apply to incidental contractors that generally do not affect facility safety, such as those that provide janitorial, laundry, and delivery services. This document addresses “conventional” safety and health. It does not address safety concerns associated with security or terrorism issues. Pages: 26

3rd Edition | October 2011 | Product Number: K222003 | Price: $91.00
You may access Std 2220 in a read-only platform: publications.api.org
Safety and Fire Protection

Phone Orders: 1-800-854-7179 (Toll-free: U.S. and Canada)

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Publ 2375
1996 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry
June 1997 | Product Number: K23751 | Price: $96.00

Publ 2376
1997 Summary of Occupational Injuries, Illness, and Fatalities in the Petroleum Industry
June 1998 | Product Number: K23761 | Price: $96.00

Publ 2377
March 1999 | Product Number: K23771 | Price: $103.00

Publ 2378
June 2000 | Product Number: K23781 | Price: $103.00

Publ 2379
March 2001 | Product Number: K23790 | Price: $103.00

Publ 2380
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Publ 2381
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Publ 2382
May 2004 | Product Number: K23821 | Price: $103.00

Publ 2383
March 2005 | Product Number: K23831 | Price: $103.00

Publ 2384
May 2006 | Product Number: K23841 | Price: $103.00

Publ 2385
June 2007 | Product Number: K23851 | Price: $103.00

Publ 2386
May 2008 | Product Number: K23861 | Price: $103.00

Publ 2387
March 2009 | Product Number: K23871 | Price: $103.00

Publ 2388
April 2010 | Product Number: K23881 | Price: $103.00

1998 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry
January 1999 | Product Number: K19996 | Price: $59.00

Phone Orders: 303-397-7956 (Local and International)
### Safety and Fire Protection

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#### STORAGE TANK SAFETY STANDARDS

**Std 2015**

Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks (ANSI/API Std 2015)

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 2006 | K20156 | $134.00 | [publications.api.org](publications.api.org) |

**RP 2016**


Supplements the requirements of Std 2015, 6th Edition. This document 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 Std 2015. Pages: 98

1st Edition | August 2001 | Reaffirmed: May 2006 | K20161 | $192.00 | [publications.api.org](publications.api.org) |

**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 that 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: June 2006 | K20214 | $134.00 | [publications.api.org](publications.api.org) |

**RP 2023**

Guide for Safe Storage and Handling of Heated Petroleum-Derived Asphalt Products and Crude-Oil Residua

Describes phenomena that 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 | Reaffirmed: June 2006 | K20233 | $110.00 | [publications.api.org](publications.api.org) |

**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 2006 | K20262 | $62.00 | [publications.api.org](publications.api.org) |

**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 | Reaffirmed: March 2012 | K22076 | $86.00 | [publications.api.org](publications.api.org) |
RP 2350
Overfill Protection for Storage Tanks in Petroleum Facilities

Addresses overfill protection for petroleum storage tanks. It is recognized that prevention provides the most basic level of protection, thus while using both terms “protection” and “prevention,” the document emphasizes prevention. The standard’s scope covers minimum overfill (and damage) prevention practices for aboveground storage tanks in petroleum facilities, including refineries, marketing terminals, bulk plants, and pipeline terminals that receive flammable and combustible liquids.

Use of this standard is intended for storage tanks associated with marketing, refining, pipeline, and terminals containing Class I or Class II petroleum liquids. Use is recommended for Class III petroleum liquids. This standard does not apply to:

- underground storage tanks;
- aboveground tanks of 1320 U.S. gallons (5000 liters) or less;
- aboveground tanks which comply with PEI 600;
- pressure vessels;
- tanks containing non-petroleum liquids;
- tanks storing LPG and LNG;
- tanks at service stations;
- tanks filled exclusively from wheeled vehicles (i.e. tank trucks or railroad tank cars); and
- tanks covered by OSHA 29 CFR 1910.119 and EPA 40 CFR 68 or similar regulations.

This standard recommends application of PEI RP 600, Recommended Practices for Overfill Prevention for Shop-Fabricated Aboveground Tanks for overfill protection where applicable for aboveground tanks falling outside the scope of this document.

The purpose of this standard is to assist owner/operators and operating personnel in the prevention of tank overfills by implementation of a comprehensive overfill prevention process (OPP). The goal is to receive product into the intended storage tank without overfill or loss of containment.

This standard is one of minimum requirements. Alternate approaches or variations on the principles of this standard that provide equivalent or more robust overfill prevention are acceptable. Alternate approaches may be needed when the tank system varies from the typical configurations described in this standard. The rationale for the implementation of each OPP should be documented and retained by the owner and operator. Pages: 47
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 Industry Environmental Conservation Association) to assist in the accounting and reporting of emissions. Pages: 907


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

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. Pages: 50

November 1999 | Product Number: IO0076 | Price: $122.00

DR 141

Global Emissions of Carbon Dioxide from Petroleum Sources

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 U.S. Environmental Protection Agency and industry documents. Pages: 91

July 1991 | Product Number: IO0141 | Price: $59.00

Publ 326

The Cost Effectiveness of VOC and NOx Emission Control Measures

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 volatile organic compounds (VOCs) and NOx. The menu provides a preliminary demonstration of how cost-effective packages of attainment strategies and control measures can be developed to reduce VOC emissions by 15% by 1996. Appendices provide a detailed analysis of costs, effectiveness, and application limitations. Pages: 354

September 1994 | Product Number: J32600 | Price: $148.00

Publ 332

Comparison of Screening Values from Selected Hydrocarbon Screening Instruments

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 exploration and production facilities as well as refineries. Pages: 128

August 1995 | Product Number: J33200 | Price: $90.00

Publ 342 and Publ 343


A number of federal, state, and local regulations are designed to control fugitive emissions of volatile organic compounds and hazardous air pollutants. API sponsored this project to present options and recommendations on procedures for obtaining inspection and maintenance 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: $63.00
Product Number for Publ 343: J34300 | Price: $63.00

Publ 344

Critical Review of Source Sampling and Analysis Methodologies for Characterizing Organic Aerosol and Fine Particulate Source Emission Profiles

Intended for use in designing future measurement programs for characterizing emissions from stationary sources that 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: $74.00

Publ 347

Hazardous Air Pollutant Emissions from Gasoline Loading Operations at Bulk Gasoline Terminals

Hazardous air pollutant (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: $83.00
35 ppm reduced exhaust emissions measured over the Federal Test
results showed that: (a) on average, lowering fuel sulfur content from 600 to
110 micrometers in diameter (PM 2.5). Source emissions data are needed to
ambient air standards for particulate matter (PM) smaller than 2.5
In 1997, the U.S. Environmental Protection Agency (EPA) promulgated new
Petroleum Industry Combustion Sources
Particulate Emission Factors and Speciation Profiles from Stationary
Vehicle Emissions Testing of Rapidly Aged Catalysts
assess the contribution of petroleum industry combustion sources to
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: I46530 | Price: $79.00

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 % 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: $61.00

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 U.S. Environmental Protection Agency (EPA) promulgated new
ambient air standards for particulate matter (PM) smaller than 2.5
micrometers in diameter (PM 2.5). Source emissions data are needed to
assess the contribution of petroleum industry combustion sources to
ambient PM 2.5 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. Pages: 119
July 2001 | Product Number: I47030 | Price: $88.00

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 U.S. Environmental Protection Agency (EPA) promulgated new
ambient air standards for particulate matter (PM) smaller than 2.5 micrometers in diameter (PM 2.5). Source emissions data are needed to
assess the contribution of petroleum industry combustion sources to
ambient PM 2.5 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. Pages: 118
August 2001 | Product Number: I47040 | Price: $88.00

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 U.S. Environmental Protection Agency (EPA) promulgated new
ambient air standards for particulate matter (PM) smaller than 2.5 micrometers in diameter (PM 2.5). Source emissions data are needed to
assess the contribution of petroleum industry combustion sources to
ambient PM 2.5 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. Pages: 100
July 2001 | Product Number: I47120 | Price: $83.00

Publ 4720
Comparison of API and EPA Toxic Air Pollutant Emission Factors for
Combustion Sources
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: $92.00

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, SO2, 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 U.S. Environmental Protection Agency 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 that 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: $62.00

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 three-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 nondegrading 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 bioattenuation 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: $108.00

Publ 4776
A Guide to Understanding, Assessment and the Regulation of PAHs in the Aquatic Environment

Designed to be an introductory guide to understanding and assessing polycyclic aromatic hydrocarbons (PAHs) in the aquatic environment (water and sediments). API prepared this guide primarily for refinery personnel and home office environmental staff who may have to address PAH issues. In addition, this guide may also be useful to staff in regulatory agencies that work with PAHs in wastewater discharge permits, waste load allocations (total maximum daily loadings), and sediment investigation and remediation.

The guide provides an overview on the chemistry, fate, and sources of PAHs in the environment and the regulatory implications. The guide also includes descriptions of the different sources of PAHs (petrogenic, pyrogenic, diagnostic, biogenic) and techniques for differentiating these sources through their characteristic fingerprints, including straightforward ways to help identify or rule out potential sources. Pages: 60

September 2011 | Product Number: I47760 | Price: $107.00

EMISSIONS: EXPLORATION AND 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: $142.00

Publ 4615
Emission Factors for Oil and Gas Production Operation

Supplements the information found in Publ 4589 and contains revised emission factors developed from 1995 API data using correlation equations established by the U.S. Environmental Protection Agency 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: $61.00

Publ 4638
Calculation Workbook for Oil and Gas Production Equipment Fugitive Emissions

This workbook, which is the result of five 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: $61.00

Publ 4644
A Methodology for Estimating Incremental Benzene Exposures and Risks Associated with Glycol Dehydrators

The U.S. Environmental Protection Agency 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: $79.00

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 facilities. EPEC II integrates user inputs, emission calculations, and data summaries for many equipment types common to exploration and production 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 API, and the Gas Research Institute. 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: $125.00
**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 API 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: $117.00

**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 can be estimated with the use of AMINECalc. System requirements for running AMINECalc Version 1.0 are an IBM PC 486 compatible or higher, 8 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: $494.00

**Publ 4680**

Amine Unit Air Emissions Model Evaluation

The implementation of the 1990 Clean Air Act Amendments 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: $120.00

**Publ 4683**

Correlation Equations to Predict Reid Vapor Pressure and Properties of Gaseous Emissions for Exploration and Production Facilities

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 for 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: $79.00

**Publ 4697**

Production Tank Emissions Model (E&P TANK, Version 2.0) (New version COMING SOON)

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 hazardous air pollutants and volatile organic compounds, 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
New Version Price to Be Determined

**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: $123.00

**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: $115.00

**EMISSIONS: REFINING**

**Publ 458**

Validation of Heavy Gas Dispersion Models with Experimental Results of the Thorney Island Trials

Volumes I & II

June 1986

**Publ 310**

Analysis of Refinery Screening Data

Analyses five and a half 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 leak detection and repair 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 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: $74.00

**Publ 4587**

Remote Sensing Feasibility Study of Refinery Fenceline Emissions

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: I45870 | Price: $70.00

Publ 4612
1993 Study of Refinery Fugitive Emissions from Equipment Leaks, Volumes I and II
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: $142.00

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. Pages: 307

April 1994 | Product Number: I46130 | Price: $97.00

Publ 4639
Estimation of Fugitive Emissions from Petroleum Refinery Process Drains
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: I46390 | Price: $87.00

Publ 4677
Emissions from refinery process drains are under increasing scrutiny, particularly with regard to volatile organic compounds (VOCs) and hazardous air pollutants because of the Clean Air Act Amendments of 1990. This publication is volume one of a three-part study initiated by 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 VOC emissions from refinery process drains. See also Publ 4639, Publ 4678, and Publ 4681. Pages: 132

April 1999 | Product Number: I46770 | Price: $97.00

Publ 4678
Volume two of a three-part study initiated by 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 volatile organic compound emissions. The model can provide insight on how to change process drain variables (flow rate, temperature, etc.) to reduce emissions. See also Publ 4639, Publ 4677, and Publ 4681. Pages: 104

April 1999 | Product Number: I46780 | Price: $97.00

Publ 4681
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® 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 Publ 4639, Publ 4677, and Publ 4678. Pages: 92

April 1999 | Product Number: I46810 | Price: $412.00

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. 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 fine 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. Pages 113

March 2002 | Product Number: I47130 | Price: $145.00

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 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. Pages: 325

November 2002 | Product Number: I47230 | Price: $164.00
EMISSIONS: VEHICLES

Publ 4605
Investigation of MOBILE5a Emission Factors: Evaluation of IM240-to-FTP Correlation and Base Emission Rate Equations

A detailed investigation and critique of the methodology used by the U.S. Environmental Protection Agency to construct the exhaust emission rate equations in MOBILE5a developed from data collected from an operating inspection and maintenance (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. Pages: 45

June 1994 | Product Number: I46050 | Price: $61.00

Publ 4637
Analysis of Causes of Failure in High Emitting Cars

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. Environmental Protection Agency (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: $70.00

Publ 4642
A Study to Quantify On-Road Emissions of Dioxins and Furans from Mobile Sources: Phase 2

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. Environmental Protection Agency's (EPA) 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: $130.00

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 methyl tert-butyl ether (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: $97.00

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 U.S. Environmental Protection Agency's (EPA) 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: $69.00

EXPOSURE: ASSESSMENT AND MONITORING

Publ 4617
A Monte Carlo Approach to Generating Equivalent Ventilation Rates in Population Exposure Assessments

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 equivalent ventilation rate 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: $79.00

Publ 4619
A Study to Characterize Air Concentrations of Methyl Tertiary Butyl Ether (MTBE) at Service Stations in the Northeast

Describes a study to measure air concentrations of MTBE; total hydrocarbons; carbon monoxide; formaldehyde; and benzene, toluene, ethylbenzene, and xylenes 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: $79.00

Publ 4622

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: $61.00

Publ 4625
Service Station Personnel Exposures to Oxygenated Fuel Components

Describes a study in four ozone nonattainment areas to measured exposures of refueling attendants and mechanics to fuel oxygenate species—methyl tertiary butyl ether, tertiary amyl methyl ether, 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: $65.00

Publ 4629
Hexavalent Chromium Exposures During Hot Work

Details the findings from an air sampling survey contracted by 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 (GTA 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) permissible exposure limit of 5 ug/m³.

June 2007 | Product Number: I46290 | Price: $85.00

## Modeling

### Publ 4546

**Hazard Response Modeling Uncertainty (a Quantitative Method): Evaluation of Commonly-Used Hazardous Gas Dispersion Models—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.

October 1992 | Product Number: I45460 | Price: $142.00

### Publ 4628

**A Guidance Manual for Modeling Hypothetical Accidental Releases to the Atmosphere**

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.

November 1996 | Product Number: I46280 | Price: $142.00

### 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. If you would like API to provide you with a hard copy of this publication for a cost of $42.00, please contact the Intellectual Property Department at API, 1220 L Street, NW, Washington, DC 20005; e-mail: apipubs@api.org; phone: 202-682-8156.

March 1998

### Ozone

### Publ 305

**Protecting Agricultural Crops from Ozone Exposures—Key Issues and Future Research Directions**

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 national ambient air quality standards be modified; and the need for future research efforts to explore the development of a suitable multiparameter index to protect vegetation from ozone exposure.

August 1991 | Product Number: J30500 | Price: $83.00

### Publ 309

**Current Status and Research Needs Related to Biogenic Hydrocarbons**

Describes 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.

June 1992 | Product Number: J30900 | Price: $113.00

### Publ 4616

**The Importance of Using Alternative Base Cases in Photochemical Modeling**

A series of Urban Airshed Model 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.

September 1994 | Product Number: I46160 | Price: $137.00

### Environment and Safety Data

The following summaries report on cases that are recorded under the U.S. Bureau of Labor Statistics’ recordkeeping guidelines. The reports are based on data submitted to API by oil and gas companies. The reports include information regarding injuries, illness, fatalities, lost workday cases, and incidence rates by function.

#### 1989 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

January 1989 | Product Number: K19996 | Price: $59.00

#### 1990 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

July 1991 | Product Number: K19988 | Price: $83.00

#### 1991 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

September 1992 | Product Number: K19987 | Price: $83.00

#### 1992 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

August 1993 | Product Number: K19986 | Price: $83.00

#### 1993 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

June 1994 | Product Number: K19985 | Price: $96.00


June 1995 | Product Number: K19984 | Price: $96.00


May 1996 | Product Number: K19983 | Price: $96.00

#### Publ 2375

**1996 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry**

June 1997 | Product Number: K23751 | Price: $96.00
## Health and Environmental Issues

Phone Orders: 1-800-854-7179 (Toll-free: U.S. and Canada)  
Phone Orders: 303-397-7956 (Local and International)

| Publ 2376 | 1997 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry  
June 1998 | Product Number: K23761 | Price: $96.00 |
|---|---|---|
| Publ 2377 | 1998 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry  
March 1999 | Product Number: K23771 | Price: $103.00 |
June 2000 | Product Number: K23781 | Price: $103.00 |
March 2001 | Product Number: K23790 | Price: $103.00 |
March 2002 | Product Number: K23801 | Price: $103.00 |
June 2003 | Product Number: K23811 | Price: $103.00 |
May 2005 | Product Number: K23821 | Price: $103.00 |
March 2005 | Product Number: K23831 | Price: $103.00 |
May 2006 | Product Number: K23841 | Price: $103.00 |
June 2007 | Product Number: K23851 | Price: $103.00 |
May 2008 | Product Number: K23861 | Price: $103.00 |
March 2009 | Product Number: K23871 | Price: $103.00 |
April 2010 | Product Number: K23881 | Price: $103.00 |

### Human Health Related Research

#### 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 human tasks.

#### Human Factors Tool for Existing Operations

Objectives of this tool include the following:

- Provide 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.

#### Human Health Related Research

**Publication TR 401**

#### Toluene: The Effect on Pregnancy of the Rat

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, 1500, and 3000 ppm toluene via inhalation for 6 hours a day from days 6 to 15 of pregnancy. The effects on the developing fetus were observed in the offspring born to the treated rats. The results showed that exposure to toluene had a significant effect on the growth and development of the offspring, with the highest exposure level causing the greatest degree of developmental abnormalities.
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: $87.00

TR 403
Closed-Patch Repeated Insult Dermal Sensitization Study of TAME
in Guinea Pigs

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: $61.00

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, 3000 and 9000 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. Pages: 152

January 1995 | Product Number: I00404 | Price: $79.00

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 B6CF1
mice at concentrations of 0, 900, 3000 and 9000 ppm in air. Summary
text as well as pertinent data on changes in body weight, pathology, and
changes in body weight upon exposure. Pages: 106

January 1995 | Product Number: I00405 | Price: $61.00

TR 409
Primary Skin Irritation Study in Rabbits of API 91-01 and PS-6
Unleaded Test Gasolines

Describes a study conducted to assess primary dermal irritation data for two
motor fuels according to Toxic Substances Control Act and Federal
Hazardous Substances Act 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 invaluable for accurate hazard
assessment and first aid treatment. Pages: 58

March 1995 | Product Number: I00409 | Price: $61.00

TR 410
Chromosome Aberrations in Chinese Hamster Ovary (CHO) Cells
Exposed to Tertiary Amyl Methyl Ether (TAME)

Evaluates the clastogenic potential of TAME using 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
aberrations in CHO cells. Pages: 56

December 1996 | Product Number: I00410 | Price: $87.00

TR 411
Chinese Hamster Ovary (CHO) HGPRT Mutation Assay of Tertiary
Amyl Methyl Ether (TAME)

Describes a study conducted to evaluate the mutagenic potential of the test
article, TAME based on quantification of forward mutations at the
hypoxanthine-guanine phosphoribosyl transferase (HGPRT) locus of 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: $87.00

TR 412 and TR 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: $97.00

Pub 4592
Odor Threshold Studies Performed with Gasoline and Gasoline
Combined with MTBE, ETBE and TAME

Examines the effects on odor detection and recognition of adding
oxygenates such as methyl tertiary butyl ether (MTBE), ethyl tertiary butyl
ether (ETBE), and tertiary amyl methyl ether (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 detect the odorant. The addition of 11 % to 15 % by volume
MTBE or 15 % by volume ETBE 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
taste threshold of gasoline. Pages: 76

January 1994 | Product Number: I45920 | Price: $79.00

Pub 4623
Anecdotal Health-Related Complaint Data Pertaining to Possible
Exposures to Methyl Tertiary Butyl Ether (MTBE): 1993 and 1994
Follow-Up Surveys

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: $61.00

Pub 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: $79.00

**Publ 4647**

Brain Glial Fibrillary Acidic Protein (GFAP) as a Marker of Neurotoxicity During Inhalation Exposure to Toluene

Evaluates the concentration of GFAP in the rat's brain as a practical biomarker of toluene-induced neurotoxicity. Adult male rats received inhalation exposure to toluene scrfomhded 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: $79.00

**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: $97.00

**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. Pages: 51

August 2001 | Product Number: I46890 | Price: $83.00

**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 U.S. Environmental Protection Agency guidelines 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: $149.00

**Publ 45592**

Results of Toxicological Studies Conducted for the American Petroleum Institute Health and Environmental Sciences Department 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: $79.00

**Natural Resource Damage Assessment**

**Publ 304**

Evaluation of Restoration Alternatives for Natural Resources Injured by Oil Spills

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: $83.00

**Publ 316**

Identifying and Measuring Nonuse Values for Natural and Environmental Resources: A Critical 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: $59.00

**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 the Norwegian Clean Seas Association for Operating Companies (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: $139.00

**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-in. diskette provide a review of the literature (post-1970) on the toxicity of crude oils and oil products in aquatic environments. Some 748 toxicity values for fish, invertebrates, and algae are assembled into a database—OILTOX. LCSO 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 640 KB RAM, DOS 2.0 or higher, and at least a 2 MB hard disk. Text may be downloaded onto a diskette and stored as a file or printed. Pages: 156

January 1995 | Product Number: I45940 | Price: $117.00
## 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: $74.00

**Publ 302**

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

November 1991 | Product Number: J30200 | Price: $90.00

**Publ 303**

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. Pages: 93

June 1992 | Product Number: J30300 | Price: $90.00

**Publ 311**
Environmental Design Considerations for Petroleum Refining

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. Pages: 93

June 1992 | Product Number: J30300 | Price: $90.00

**Publ 3101**
Executive Summary: Environmental Design Considerations for Petroleum Refining

Executive summary to Publ 311. Pages: 13

February 1993 | Product Number: J31101 | Price: $148.00

**Publ 312**
Responding to Environmental Challenge: The Petroleum Industry and Pollution Prevention

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: $89.00

**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 five 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: $100.00

**Publ 331**
Environmental Performance Indicators: Methods for Measuring Pollution Prevention

This report is the fifth in a series that describes the 1992–1993 survey and includes information on how the industry has achieved compliance with the land disposal restrictions on Resource Conservation and Recovery Act (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

September 1994 | Product Number: J33100 | Price: $63.00

**Publ 333**
Generation and Management of Residual Materials

This report is the fifth in a series that describes the 1992–1993 survey and includes information on how the industry has achieved compliance with the land disposal restrictions on Resource Conservation and Recovery Act (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: $100.00
Health and Environmental Issues

Publ 336
This report is the sixth in a series of reports presenting the results of the API Annual Refining Residual 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: $100.00

Publ 339
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% 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: $100.00

Publ 345
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% 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: $100.00

Soil and Groundwater Research
www.api.org/groundwater

Publ 4722
API 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. a methyl tertiary-butyl ether (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: $59.00

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 at www.api.org/environment-health-and-safety/clean-water/ground-water/bulletins.aspx.

Bulletin No. 1
Summary of Processes, Human Exposures and Remediation Technologies Applicable to Low Permeability Soils
September 1996

Bulletin No. 3
Ten Frequently Asked Questions About MTBE in Water
March 1998

Bulletin No. 5
Evaluation of Sampling and Analytical Methods for Measuring Indicators of Intrinsic Bioremediation
March 1998

Bulletin No. 8
Characteristics of Dissolved Petroleum Hydrocarbon Plumes: Results from Four Studies
December 1998

Bulletin No. 9
Non-Aqueous Phase Liquid (NAPL) Mobility Limits in Soil
June 2000

Bulletin No. 10
Simulation of Transport of Methyl Tert-Butyl Ether (MTBE) to Ground-Water from Small-Volume Releases of Gasoline in the Valdose Zone
June 2000

Bulletin No. 11
Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE
August 2000

Bulletin No. 12
No-Purge Sampling: An Approach for Long-Term Monitoring
October 2000

Bulletin No. 13
Dissolution of MTBE from a Residually Trapped Gasoline Source
September 2001

Bulletin No. 14
Predicting the Effect of Hydrocarbon and Hydrocarbon-Impacted Soil on Groundwater
September 2001
Implications for Characterization and Monitoring of “Diving Plumes” from the CDOT-MTL
Attenuation Factors Using a Screening-Level Model and Field Data
March 2012

Tertiary Butyl Alcohol (TBA) Biodegradation: Some Frequently Asked Questions
Bulletin No. 26
March 2012

GeoTracker Database
Remediation Progress at California LUFT Sites: Insights from the GeoTracker Database
April 2006

Downward Solute Plume Migration: Assessment Significance and Implications for Characterization and Monitoring of “Diving Plumes”
Bulletin No. 24
April 2006

Remediation Progress at California LUFT Sites: Insights from the GeoTracker Database
Bulletin No. 25
February 2012

Tertiary Butyl Alcohol (TBA) Biodegradation: Some Frequently Asked Questions
Bulletin No. 26
March 2012

Hydrocarbons in Ground Water: Effect on Concentrations Near a Source Resource
December 2001

Migration of Soil Gas Vapors to Indoor Air: Determining Vapor Attenuation Factors Using a Screening-Level Model and Field Data from the CDOT-MTL
Bulletin No. 16
April 2002

Identification of Critical Parameters for the Johnson and Ettinger (1991) Vapor Intrusion Model
Bulletin No. 17
May 2002

Answers to Frequently Asked Questions About Managing Risk at LNAPL Sites
Bulletin No. 18
May 2003

Evaluation of Small-Volume Releases of Ethanol-Blended Gasoline at UST Sites
Bulletin No. 19
October 2003

Answers to Frequently Asked Questions About Ethanol Impacts to Groundwater
Bulletin No. 20
December 2003

Evaluation of Potential Vapor Transport to Indoor Air Associated with Small-Volume Releases of Oxygenated Gasoline in the Vadose Zone
Bulletin No. 21
January 2005

Maximum Potential Impacts of Tertiary Butyl Alcohol (TBA) on Groundwater from Small-Volume Releases of Ethanol-Blended Gasoline in the Vadose Zone
Bulletin No. 22
January 2005

The Impact of Gasohol and Fuel-Grade Ethanol on BTX and Other Hydrocarbons in Ground Water: Effect on Concentrations Near a Source Resource
Bulletin No. 23
December 2005

Downward Solute Plume Migration: Assessment Significance and Implications for Characterization and Monitoring of “Diving Plumes”
Bulletin No. 24
April 2006

Publ 4627
June 1995 | Product Number: I46270 | Price: $61.00

CONTAMINANT FATE AND TRANSPORT

Chemical Fate and Impact of Oxygenates in Groundwater: Solubility of BTEX from Gasoline-Oxygenate Mixtures
Publ 4531
August 1991 | Product Number: I45310 | Price: $61.00

Transport and Fate of Non-BTEX Petroleum Chemicals in Soils and Groundwater
Publ 4593
September 1994 | Product Number: I45930 | Price: $65.00

Transport and Fate of Dissolved Methanol, MTBE and Monoaromatic Hydrocarbons in a Shallow Sand Aquifer
Publ 4601
April 1994 | Product Number: I46010 | Price: $123.00

Chemical Fate and Impact of Oxygenates in Groundwater: Solubility of BTEX from Gasoline-Oxygenate Mixtures
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Transport and Fate of Dissolved Methanol, MTBE and Monoaromatic Hydrocarbons in a Shallow Sand Aquifer
Publ 4601
April 1994 | Product Number: I46010 | Price: $123.00
The two principal research objectives of this study are (1) the identification of produced water release scenarios that have a potential to cause groundwater impairment in homogeneous subsurface geologic profiles and (2) the produced water release scenarios that have a potential to cause groundwater impairment. Pages: 68

September 1995 | Product Number: I46330 | Price: $59.00

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 the 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: $97.00

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 three years to allow calculation of in-situ biodegradation rates. Laboratory microcosm experiments were performed to further characterize the biodegradation of benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tertiary-butyl ether (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 the following:
- direct measurement through sampling of enclosed-space vapors,
- use of near-foundations 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: $79.00

Publ 4734
Modeling Study of Produced Water Release Scenarios

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

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December 1998 | Product Number: I46740 | Price: $79.00

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.

The two principal research objectives of this study are (1) the identification of produced water release scenarios that have a potential to cause groundwater quality impairment in homogeneous subsurface geologic profiles and (2) 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 groundwater 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 groundwater 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 groundwater 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 groundwater impairment. Pages: 124

January 2005 | Product Number: I47340 | Price: $123.00

Publ 4758
Strategies for Addressing Salt Impacts of Produced Water Releases to Plants, Soil, and Groundwater

The exploration and production 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: $70.00

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 pesticide 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. Environmental Protection Agency. 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

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This publication is a new entry in this catalog.

This publication is related to an API licensing, certification, or accreditation program.
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. Pages: 142


REMEDIAL TECHNOLOGIES

DR 225
Remediation of a Fractured Clay Till Using Air Flushing: Field Experiments at Sarnia, Ontario

This study was conducted over a three-year period at a well-characterized test site located in Canada near Sarnia, Ontario. A synthetic gasoline 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 and in-situ air sparging, were able to remove ~40% of the spilled mass during the initial two 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 benzene, toluene, ethylbenzene, and xylenes compounds was biodegraded. Pages: 220

October 1998 | Product Number: I00225 | Price: $97.00

Publ 4525
A Compilation of Field-Collected Cost and Treatment Effectiveness Data for the Removal of Dissolved Gasoline Components from Groundwater

Documents, summarizes, and evaluates 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 and isopropyl ether. 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: $79.00

Publ 4609
In-Situ Air Sparging: Evaluation of Petroleum Industry Sites and Considerations for Applicability, Design and Operation

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: $97.00

Publ 4631
Petroleum Contaminated Low Permeability Soil: Hydrocarbon Distribution Processes, Exposure Pathways and In-Situ Remediation Technologies

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: $87.00

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-buty ether (MTBE). Contaminated groundwater was the primary constituent of the wastewater, which also contained benzene, toluene, ethylbenzene, and xylenes (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: $123.00

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: $70.00

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 light nonaqueous phase liquid (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 | Software and documentation can be downloaded at www.api.org/LnAP

Publ 4730
Groundwater Remediation Strategies Tool

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: $127.00
Publication: Publ 4760
Title: LNAPL Distribution and Recovery Model (LDRM)
Description: Simulates the performance of proven hydraulic technologies for recovering free-product petroleum liquid releases to groundwater. The LDRM provides information about light nonaqueous phase liquid (LNAPL) distribution in porous media and allows the user to estimate LNAPL recovery rates, volumes, and times. Documentation for the LDRM is provided in two 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.

Publication: Publ 4599
Title: Interlaboratory Study of Three Methods for Analyzing Petroleum Hydrocarbons in Soils
Description: 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 are estimated for each method. The full text of each method is included in the report. Pages: 166

Publication: Publ 4635
Title: Compilation of Field Analytical Methods for Assessing Petroleum Product Releases
Description: 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

Publication: Publ 4657
Title: Effects of Sampling and Analytical Procedures on the Measurement of Geochemical Indicators of Intrinsic Bioremediation: Laboratory and Field Studies
Description: 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

Publication: Publ 4658
Title: Methods for Measuring Indicators of Intrinsic Bioremediation: Guidance Manual
Description: 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, providing procedures that will improve the representative quality of the collected data, and considering potential biases introduced into data through the sampling and analytical techniques employed in the site investigation. Pages: 96

Publication: Publ 4659
Title: Graphical Approach for Determining Site-Specific Dilution-Attenuation Factors (DAFs): Technical Background Document and User's Guide
Description: The 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

Publication: Publ 4668
Title: Delineation and Characterization of the Borden MTBE Plume: An Evaluation of Eight Years of Natural Attenuation Processes
Description: In 1988, a natural gradient tracer test was performed in the shallow sand aquifer at Canada Forces Base 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, and 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% 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
Health and Environmental Issues

Fax Orders: 303-397-2740
Online Orders: www.global.ihs.com

Publ 4699
Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE

Applies the principles of risk-informed decision making to the evaluation of methyl tertiary-butyl ether (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. Pages: 120

February 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 U.S. Environmental Protection Agency and research groups such as the Petroleum Environmental Research Forum and the Total Petroleum Hydrocarbon Criteria Working Group are used to calculate RBSLs for TPH in crude oil and condensate obtained from around the world. These methodologies were also applied to polyaromatic hydrocarbons, 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 exploration and production (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. Pages: 100

February 2001 | Product Number: I47090 | Price: $83.00

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 nonaqueous phase liquid saturation, and 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 are provided in the appendix. Pages: 72

July 2001 | Product Number: I47110 | Price: $112.00

Publ 4731
Light Non-Aqueous Phase Liquid (LNAPL) Parameters Database—Version 2.0—Users Guide

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 gives 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: $127.00

The database is available from API's website: www.api.org/environment-health-and-safety/clean-water/ground-water/lnap/lnap-params-db.aspx

Publ 4739
API Interactive LNAPL Guide—Version 2.0

A comprehensive and easy-to-use electronic information system and screening utility. The guide is designed to provide an overall approach for evaluating light nonaqueous phase liquid (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 the following:

- 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; and
- an extensive reference list.


Publ 4761
Technical Protocol for Evaluating the Natural Attenuation of MtBE

Addresses data collection, evaluation, and interpretation procedures that consider the physical, chemical, and biological properties of methyl tert-butyl ether (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 the following:

- 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. Pages: 186

May 2007 | Available from API's website: www.api.org/mtbe
Environmental Stewardship Program Publications

RP 75
Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities

Provides guidance for use in preparing safety and environmental management programs 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, start-up, operation, inspection, and maintenance of new, existing, and modified facilities. Pages: 41

Product Number: G07503 | Price: $89.00
You may access RP 75 in a read-only platform at publications.api.org

Publ 9100
Model Environmental, Health and Safety (EHS) Management System and Guidance Document

Comes with a binder complete with both Publ 9100A and Publ 9100B—see descriptions listed below. Pages: 65
October 1998 | Product Number: R9100S | Price: $157.00

Publ 9100A
Model Environmental, Health and Safety (EHS) Management System

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 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 Publ 9100B for additional information. Publ 9100A and Publ 9100B are intended to be companion documents and can be purchased as a set or individually. Pages: 20
October 1998 | Product Number: R9100A | Price: $76.00

Publ 9100B
Guidance Document for Model EHS Management System

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 that 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 Publ 9100A. Publ 9100A and Publ 9100B are intended to be companion documents and can be purchased as a set or individually. Pages: 43
October 1998 | Product Number: R9100B | Price: $109.00

Storage Tank Research

Publ 301
Aboveground Storage Tank Survey: 1989

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
April 1989 | Product Number: J30100 | Price: $63.00

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 that utilized volumetric methods to detect leaks. A series of field tests were conducted on a 114-ft 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. Pages: 43
October 1991 | Product Number: J30600 | Price: $74.00

Publ 307
An Engineering Assessment of Acoustic Methods of Leak Detection in Aboveground Storage Tanks

Provides the results of a leak detection project in aboveground storage tanks that utilized acoustic methods to detect leaks. A series of field tests were conducted on a 114-ft 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. Pages: 76
January 1992 | Product Number: J30700 | Price: $74.00

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: $74.00

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. Pages: 80
January 1994 | Product Number: J32200 | Price: $74.00

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. Pages: 86
January 1994 | Product Number: J32300 | Price: $74.00

Publ 325
An Evaluation of a Methodology for the Detection of Leaks in Aboveground Storage Tanks

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. Pages: 94
May 1994 | Product Number: J32500 | Price: $90.00

This publication is a new entry in this catalog.

This publication is related to an API licensing, certification, or accreditation program.
Health and Environmental Issues

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Publ 327
Aboveground Storage Tank Standards: A 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: $74.00

Publ 328
Laboratory Evaluation of Candidate Liners for Secondary Containment of Petroleum Products

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: $83.00

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: $74.00

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: $83.00

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: $74.00

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 in. to 18 in. in diameter and 250 ft 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: $83.00

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 Std 2610 and Publ 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

Analyzes 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 and API. This report is intended to provide an overview of the study methodology and results. Pages: 47

April 2002 | Product Number: I47160 | Price: $94.00

Surface Water Research

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 the Norwegian Clean Seas Association for Operating Companies (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: $139.00

DR 343
Automated Validation System for the Offshore Operations Committee Mud and Produced Water Discharge Model

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 the 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 4664
Mixing Zone Modeling and Dilution Analysis for Water-Quality-Based NPDES Permit Limits
This report is designed to
• provide an overview of the U.S. Environmental Protection Agency’s (EPA) policies and technical guidance on the role of mixing zones in the National Pollutant Discharge Elimination System (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: $97.00

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 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: $97.00

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: $97.00

Publ 4688
Temporary Treatment Options for Petroleum Distribution Terminal Wastewaters
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. Pages: 73

November 1999 | Product Number: I46880 | Price: $122.00

Publ 4694
Laboratory Analysis of Petroleum Industry Wastewaters
Assists 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: $122.00

Publ 4695
Understanding and Preparing Applications for Petroleum Facility NPDES Discharge Permits
Assists 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 assurance 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. Pages: 220

December 1999 | Product Number: I46950 | Price: $129.00

Publ 4698
A Review of Technologies to Measure the Oil and Grease Content of Produced Water from Offshore Oil and Gas Production Operations
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 the U.S. Environmental Protection Agency’s hexane extraction method, Method 1664, are provided. Pages: 138

November 1999 | Product Number: I46980 | Price: $122.00

Publ 4717
Predictors of Water-Soluble Organics (WSOs) in Produced Water--A Literature Review
Reviews the scientific literature on the identity and physical/chemical characteristics of the WSOs in produced water in relation to characteristics of fossil fuels and their reservoirs. Pages: 24

March 2002 | Product Number: I47170 | Price: $74.00
Health and Environmental Issues

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: $139.00

Publ 4736
Identification of Key Assumptions and Models for the Development of Total Maximum Daily Loads

Provides 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: $149.00

Publ 4750
Cyanide Discharges in the Petroleum Industry: Sources and Analysis

Because both industrial and municipal dischargers have been issued National Pollutant Discharge Elimination System 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: $94.00

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 U.S. 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 and water-quality-based effluent limits. Pages: 37

1st Edition | December 2005 | Product Number: I47510 | Price: $70.00

Publ 4756
Interim Permitting Manual—Navigating NPDES Permit Issues on Impaired Waters

Addresses many water quality standards issues that facilities may encounter, including existing uses, use attainability analyses to revise designated uses, fish consumption advisories, whole effluent toxicity 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 total maximum daily loading (TMDL) because they are expected to meet water 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, nonnumeric effluent limitations, and calculating numeric effluent limitations. Pages: 41

November 2006 | Product Number: I47560 | Price: $76.00

BIOMONITORING

TR 402
Toxicity to Freshwater Alga, Selenastrum capricornutum

Describes a study conducted to assess the effect of tert-amyl methyl ether 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 that 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: $61.00

TR 406
TAME—Acute Toxicity to Daphnids Under Flow-Through Conditions

Describes the measurement of acute toxicity of tertiary amyl methyl ether (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: $61.00

TR 407
TAME—Acute Toxicity to Mysid Shrimp (Mysidopsis bahia) Under Static Renewal Conditions

Describes the measurement of acute toxicity of tertiary amyl methyl ether (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: $61.00

TR 408
TAME—Acute Toxicity to Rainbow Trout Under Flow-Through Conditions

Describes the measurement of acute toxicity of tertiary amyl methyl ether (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: $61.00

Publ 4610
Critical Review of Draft EPA Guidance on Assessment and Control of Bioconcentratable Contaminants in Surface Waters

Reviews the U.S. 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 National Pollutant Discharge Elimination System (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: $70.00
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<th>Publ 4656</th>
<th>Bioaccumulation: How Chemicals Move from the Water into Fish and Other Aquatic Organisms</th>
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**EFFLUENTS: EXPLORATION AND PRODUCTION**

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<th>Minimization, Handling, Treatment and Disposal of Petroleum Products Terminal Wastewaters</th>
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**Publ 4690**  
A Guide for the Use of Semipermeable Membrane Devices (SPMDs) as Samplers of Waterborne Hydrophobic Organic Contaminants

Provides 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, 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 biomonitor, 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. Pages: 172  
March 2002  |  Product Number: I46900  |  Price: $132.00

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**Publ 4700**  
Primer for Evaluating Ecological Risk at Petroleum Release Sites

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 a "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. Pages: 52  
May 2001  |  Product Number: I47000  |  Price: $103.00

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**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. Environmental Protection Agency (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 EPA guidance for C18 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, phenol associated with a jet fuel additive, and two brominated organics 
December 1997  |  Product Number: I00148  |  Price: $61.00

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**Publ 352**  

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: $122.00

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**OIL SPILLS**

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

Assists the petroleum industry in understanding the Spill Prevention, Control, and Countermeasure (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 worker; or offshore oil drilling, production, or worker) 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. The purchase of D16 includes Bull D16, the Plan Template, and a CD-ROM with the Microsoft® Word version of the Plan Template.  
5th Edition  |  April 2011  |  Product Number: GD1605  |  Price: $258.00  |  Template Only: Price: $95.00

**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 nonbuoyant 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: $94.00

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**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

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February 1995  |  Product Number: I45580  |  Price: $87.00

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**Publ 4640**  

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: (1) 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, and (2) 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: $60.00  
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**Publ 4649**
The Use of Chemical Countermeasures Product Data for Oil Spill Planning and Response, Volumes I and II

Addresses many of the issues related to potential uses of chemical countermeasure products 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: $57.00

**Publ 4675**
Fate and Environmental Effects of Oil Spills in Freshwater Environments

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: $142.00

**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 cleanup method by reducing removal, transportation, and disposal costs as well as reducing the time required for cleanup. This study was commissioned by API 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: $117.00

**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. Pages: 51

August 2001 | Product Number: I4689 | Price: $83.00

**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 API for oil spill response decision-makers to provide 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 API 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 untreated oil and chemically dispersed oil in the marine environment. Pages: 50

May 2001 | Product Number: I46930 | Price: Free*

**Publ 4706**
Environmental Considerations for Marine Oil Spill Response

API is offering a new revision of Environmental Considerations for Marine Oil Spill Response, generally known as the “Marine Manual.” API, 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. Material 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. Pages: 322

July 2001 | Product Number: I47060 | Price: $76.00

**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: $85.00

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*This publication is a new entry in this catalog.
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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.

Pages: 54
April 2004 | Product Number: I46350 | Price: Free*

In-Situ Burning—A Decision-Maker's Guide to In-Situ Burning

This scenario is fictitious, but the circumstances are possible. In-situ burning (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 smithy's technology when responding to an oil spill on land or on water.

Pages: 76

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1995 Oil Spill Conference White Papers

Three white papers—(1) “Implementing an Effective Response Management System,” (2) “The Use and Abuse of Science in Natural and Resource Damage Assessment,” and (3) “Perspectives on Establishing and Maintaining Oil Pollution Capabilities”—were prepared for the 1995 Oil Spill 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
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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 Spill 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: $59.00

Publ 4675
Fate and Environmental Effects of Oil Spills in Freshwater Environments

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: $142.00

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 cleanup method by reducing removal, transportation, and disposal costs as well as reducing the time required for cleanup. This study was commissioned by API 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: $117.00

Publ 4686
1999 Oil Spill Conference Proceedings
1999 | CD-ROM Product Number: I4686A | Price: $59.00
Hard Copy Product Number: I4686B | Price: $59.00

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 Spill Conference to address issues of varying scientific and sociopolitical importance to the oil spill community. Pages: 106
January 1999 | Product Number: I46870 | Price: $59.00

This publication is a new entry in this catalog. ◆ This publication is related to an API licensing, certification, or accreditation program.

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Health and Environmental Issues

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Publ 4710
2003 Oil Spill Conference Proceedings
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Publ 4718
2005 Oil Spill Conference Proceedings
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SEDIMENTS

Publ 4607
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 preparation. This publication additionally includes a user's guide for readers unfamiliar with sediment toxicity testing. See also Publ 4608. Pages: 236
November 1994 | Product Number: I46070 | Price: $109.00

Publ 4608
User's Guide: Evaluation of Sediment Toxicity Tests for Biomonitoring Programs
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: I46070 | Price: $109.00

Publ 4632
Reducing Uncertainty in Laboratory Sediment Toxicity Tests
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 species' sediment characteristics, evaluates copper sulfate as a reference toxicant by determining the relative sensitivities of freshwater testing organisms, and evaluates potential sublethal endpoints for sediment toxicity. Pages: 152
September 1995 | Product Number: I46320 | Price: $61.00

Waste Research

Guidelines for Commercial Exploration and Production Waste Management Facilities
Provides guidelines for the design and operations of commercial exploration and production 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. Pages: 80

Overview of Exploration and Production Waste Volumes and Waste Management Practices in the United States
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, describes 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

DR 53
Characterization of Exploration and Production Associated Wastes
Approximately 0.1% 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 land spreading, road spreading, and burial. Pages: 160
November 1996 | Product Number: I00053 | Price: $136.00

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 (silt 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: $90.00

Publ 4465
Evaluation of the Treatment Technologies for Listed Petroleum Refinery Wastes
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: $70.00

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, sodium adsorption ratio and exchangeable sodium percentage for salinity, and oil and grease for petroleum hydrocarbons. Pages: 66
August 1993 | Product Number: I45270 | Price: $61.00

This publication is a new entry in this catalog. This publication is related to an API licensing, certification, or accreditation program.
Health and Environmental Issues

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Publ 4600  

Provides scientifically defensible guidelines for land management of exploration and production 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 the U.S. Environmental Protection Agency 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: $59.00

Publ 4618  
Characteristics and Performance of Supercritical Fluid Extraction (SFE) in the Analysis of Petroleum Hydrocarbons in Soils and Sludges

Summarizes the results of a study to evaluate and improve 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: $59.00

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: $110.00

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: 50
July 2004 | Product Number: I47330 | Price: $92.00

Publ 4758  
Strategies for Addressing Salt Impacts of Produced Water Releases to Plants, Soil, and Groundwater

The exploration and production 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: $70.00
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Weekly Statistical Bulletin (WSB)

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; naptha; kerosene jet fuel; distillate (by sulphur content); and residual fuel oil. These products represent more than 80% of total refinery production. Inventories of these products as well as crude oil and unfinished oils are also included, along with refinery input data. There are additional breakouts of gasoline blending components and distillate sulfur levels.

The WSB is published weekly every Tuesday afternoon (published Wednesday afternoon in the event of a Monday holiday) 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.

API's WSB Data is timely and accurate information currently available for futures commodities trading and analysis through authorized API redistributors. Contact apidata@api.org for more information.

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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.

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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 the export of crude oil and petroleum products exports. Included are: port of exit, country of destination, the number of shipments, quantity, shipment value, and derived prices. The exports report is based on data collected by the Department of Commerce/Bureau of the Census and is available each month.

Import data is based on reports filed with the U.S. Department of Energy's Energy Information Administration. The report is available by the second week of each month. Historical data are also available in electronic format.

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Inventories of Natural Gas Liquids and Liquefied Refinery Gases

Presents data on the inventory levels of ethane, propane, isobutane, normal butane, and pentanes plus. These inventories, located at natural gas plants, at refineries, at bulk terminals, and in underground storage, are grouped into eight regional areas. The report is issued each month and covers the previous month.

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Quarterly Well Completion Report (QWCR)

The QWCR provides detailed information on reported drilling activity and estimates the total number of wells and footage drilled. The estimates of quarterly completions and footage are displayed by well type, well class, and quarter for the 10 years prior. More detailed estimates of quarterly completions and footage are disaggregated by well type, depth interval, and quarter for the current year and 2 years prior. In addition, wells reported to API (not estimates) are listed on a state and regional level, disaggregated by well class, well type, and quarter, for the current year and 2 years prior.

The report is available within two weeks following the end of a quarter.

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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.

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(2011) Product Number: N62817 | Price: $600.00

Joint Association Survey on Drilling Costs (JAS)

The JAS is an annual survey that contains the only long-term source of information of detailed U.S. drilling expenditures on wells, footage and related expenditures in the United States. An Analysis & Trends section provides detailed information and graphs about offshore and onshore wells, shale wells, coalbed methane wells, and sidetrack wells. The data presented in the U.S. Summary Tables section are broken down by well type (oil wells, gas wells, and dry holes) and by depth interval. Additionally, the data in these tables are disaggregated by well class (exploratory wells and development wells) and offshore and onshore production. A few regional and state tables are also available in this report. For more information on the Joint Association Survey state tables, please contact apipubs@api.org.

Single Subscriber
(2010) Product Number: T00007 | Price: $3,100.00
estimates a risk value associated with the operation of each equipment 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 purpose 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; and
- 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, call 202-682-8212 or e-mail fowler@api.org.

### 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.

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 document. Pages: 96

Publ 4575
Proceedings of the 1991 Oil Spill Conference Infobase
The Proceedings of the 1991 Oil Spill Conference are available on 3.5-in. or 5.25-in. 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 512 KB 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: $65.00

Publ 4636
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 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: $275.00

Publ 4640
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: (1) 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; and (2) the standard noneditable version is read-only. Both versions are completely searchable; each word in the bibliography is indexed. Pages: 224

March 1997
(nondeletable) Product Number: I46400 | Price: $60.00
(VIP editable) Product Number: I46401 | Price: $75.00
DISCUSSION PAPERS

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 Clean Water Act, the nonpoint source pollution problem in the United States, and the current emphasis on watershed management approaches.
November 1993

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 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 non-problem of resource exhaustion will distract from or even aggravate the challenge of removing institutional barriers to supply development.
December 1995

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 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 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 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.
October 1997

RESEARCH STUDIES

RS 032
An Empirical Analysis of the Determinants of Petroleum Drilling
December 1983

RS 051
The Use of Economic Incentive Mechanisms in Environmental Management
June 1990

RS 053
Reducing Emissions from Older Vehicles
August 1990

RS 056
Economics of Alternative Fuel Use: Compressed Natural Gas as a Vehicle Fuel
December 1990

RS 064
U.S. Petroleum Supply: History, Prospects, and Policy Implications
September 1992
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, carbon monoxide, and nitrogen oxides. 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 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 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 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 (a) are based on false assumptions of accident causes; (b) are not needed to solve the uninsured motorist problem; (c) incorrectly link promises of large savings to paying for insurance at the pump; and (d) are both inequitable and inefficient.

December 1994

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 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

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


PAPERS ON SPECIFIC ISSUES

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Policy Analysis Department
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September 1996 | Price: No charge for first five single copies
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Translated Publications

Fax Orders: 303-397-2740

Chapter 3.1B
Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Tanks by Automatic Tank Gauging—Spanish
Spanish translation of Ch. 3.1B.

Chapter 3.4
Standard Practice for Level Measurement of Liquid Hydrocarbons on Marine Vessels by Automatic Tank Gauging—Spanish
Spanish translation of Ch. 3.4.
1st Edition | April 1995 | Product Number: H03041S | Price: $83.00

Chapter 5.1
General Considerations for Measurement by Meters—Spanish
Spanish translation of Ch. 5.1.

Chapter 5.2
Measurement of Liquid Hydrocarbons by Displacement Meters—Spanish
Spanish translation of Ch. 5.2.
3rd Edition | October 2005 | Product Number: H50203S | Price: $87.00

Chapter 5.3
Measurement of Liquid Hydrocarbons by Turbine Meters—Spanish
Spanish translation of Ch. 5.3.
5th Edition | September 2005 | Product Number: H50305S | Price: $106.00

Spec 7-1/ISO 10424-1:2004
Specification for Rotary Drill Stem Elements—Spanish
Spanish translation of Spec 7-1.
1st Edition | February 2006 | Product Number: GX7101SP | Price: $130.00

Specification for Threading and Gauging of Rotary Shouldered Thread Connections—Spanish
Spanish translation of Spec 7-2.
1st Edition | June 2008 | Product Number: GX7201SP | Price: $139.00

Recommended Practice for Drill Stem Element Inspection—Spanish
Spanish translation of RP 7G-2.
1st Edition | August 2009 | Product Number: GX7G201SP | Price: $112.00

Chapter 7.3
Fixed Automatic Tank Temperature Systems—Spanish
Spanish translation of Ch. 7.3.
2nd Edition | October 2011 | Effective Date: March 26, 2013
Product Number: H70302S | Price: $83.00

Chapter 8.2
Standard Practice for Automatic Sampling of Liquid Petroleum and Petroleum Products—Spanish
Spanish translation of Ch. 8.2.
2nd Edition | October 1995 | Product Number: H80202SP | Price: $97.00

Chapter 8.3
Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products—Spanish
Spanish translation of Ch. 8.3.
1st Edition | October 1995 | Product Number: H80301SP | Price: $89.00

Chapter 13.1
Statistical Concepts and Procedures in Measurement—Spanish
Spanish translation of Ch. 13.1.
1st Edition | June 1985 | Effective Date: July 17, 2013
Product Number: H130101SP | Price: $83.00

Chapter 17.1
Guidelines for Marine Cargo Inspection—Spanish
Spanish translation of Ch. 17.1.
5th Edition | March 2008 | Product Number: H1701SP | Price: $129.00

Chapter 17.2
Measurement of Cargoes on Board Tank Vessels—Spanish
Spanish translation of Ch. 17.2.
2nd Edition | May 1999 | Product Number: H1702SP | Price: $132.00

Chapter 17.4
Method for Quantification of Small Volumes on Marine Vessels (OBQ/ROB)—Spanish
Spanish translation of Ch. 17.4.
1st Edition | October 1994 | Product Number: H30410SP | Price: $97.00

Chapter 17.5
Guidelines for Voyage Analysis and Reconciliation of Cargo Quantities—Spanish
Spanish translation of Ch. 17.5
3rd Edition | April 2012 | Effective Date: March 26, 2013
Product Number: H170503S | Price: $145.00

Chapter 17.6
Guidelines for Determining Fullness of Pipelines Between Vessels and Shore Tanks—Spanish
Spanish translation of Ch. 17.6.
1st Edition | August 1994 | Product Number: H17061SP | Price: $97.00

Chapter 17.8
Guidelines for Pre-Loading Inspection of Marine Vessel Cargo Tanks—Spanish
Spanish translation of Ch. 17.8.
1st Edition | August 1998 | Product Number: H1708SP | Price: $97.00

Chapter 17.9
Vessel Experience Factor (VEF)—Spanish
Spanish translation of Ch. 17.9.
2nd Edition | May 2012 | Effective Date: March 26, 2013
Product Number: H170902S | Price: $165.00

Chapter 17.11
Measurement and Sampling of Cargoes On Board Tank Vessels Using Closed/Restricted Equipment—Spanish
Spanish translation of Ch. 17.11.
1st Edition | May 2009 | Product Number: H170111SP | Price: $98.00

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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 51 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.
August 1980 | Reaffirmed, March 1997 | Price: $45.00

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.
August 1980 | Reaffirmed, March 1997 | Price: $45.00

Chapter 11.1
Volume Correction Factors—Volume III

Table 5C—Generalized Products, Correction of Observed API Gravity to API Gravity at 60°F.
Table 6C—Generalized Products, Correction of Volume to 60°F Against API Gravity at 60°F.
August 1980 | Reaffirmed, March 1997 | Price: $45.00

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 to 60°F Against Thermal Expansion Coefficients at 60°F.
August 1980 | Reaffirmed, March 1997 | Price: $45.00

Chapter 11.1
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August 1980 | Reaffirmed, March 1997 | Price: $45.00
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.
1st Edition | August 1984 | Reaffirmed, May 1996 | Price: $142.00

Chapter 11.2.1
Compressibility Factors for Hydrocarbons: 0–90 °API Gravity Range
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
1st Edition | August 1984 | Reaffirmed, May 1996 | Price: $142.00

Chapter 11.2.1M
Compressibility Factors for Hydrocarbons: 638–1074 Kilograms per Cubic Meter Range
Provides tables in metric (SI) units 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 density (15 °C) of metered material. Pages: 187
1st Edition | August 1984 | Reaffirmed, May 1996 | Price: $142.00

Chapter 11.2
CD-ROM and Documentation of Chapters 11.2.1, 11.2.1M, 11.2.3, 11.2.3M
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.
1st Edition | 1984

Chapter 11.2
Computer Tape Information and Documentation for Chapters 11.2.1, 11.2.1M, 11.2.3 and 11.2.3M
Provides only the text information from Chapters 11.2.1, 11.2.1M, 11.2.3 and 11.2.3M, and information pertaining to the use of the magnetic tape described above. The manual is included with orders for the magnetic tape.
Page: 11
1st Edition | 1984

WITHDRAWN IN 2013

RP 5C7
Recommended Practice for Coiled Tubing Operations in Oil and Gas Well Services
1st Edition | December 1996

RP 7A1
Recommended Practice for Testing of Thread Compound for Rotary Shouldered Connections
1st Edition | November 1992

RP 1632
Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems
3rd Edition | January 1996

WITHDRAWN PUBLICATIONS
The documents listed in this section have been withdrawn and are no longer being maintained by the responsible standards committee. Copies of these documents are available for purchase at www.api.org/publications.

Exploration and Production
Glossary of Oil Field Production Terminology, 1st ed. 1988
Report of Eastern/Western Hemisphere Production of Casing, Tubing, and Drill Pipe, 1997-2004
Report of Eastern/Western Hemisphere Production of Line Pipe, 1997-2004
Vocational Training Series 1–6

Book 1, Introduction to Oil and Gas Production, 4th ed. 1983
Book 2, Corrosion of Oil and Gas Well Equipment, 1st ed. 1958, 2nd ed. 1990
Book 3, Subsurface Salt Water Injection and Disposal, 2nd ed. 1978
Book 4, Well Testing, 2nd ed. 1976
Book 5, Wireline Operations and Procedures, 1983
Book 6, Gas Lift, 1984

1 Oil Field Betting, 10th ed. 1947-12th ed. 1957
1A Oil-Field Flat Betting, 1st ed. 1957
2 Oil Field Boilers, 1st ed. 1928-10th ed. 1949
2ALRFD-S1 Supplement 1 to Planning, Designing and Constructing Fixed Offshore Platforms—Load and Resistance Factor Design, 1st ed. 1997
2E Drilling Rig Packaging for Minimum Self-Contained Platforms, 1st ed. 1973
2G Production Facilities on Offshore Structures, 1st ed. 1974
2K Care and Use of Marine Drilling Risers, 1st ed. 1977, 2nd ed. 1982
2M Qualifications Testing of Steel Anchor Designs for Floating Structures, 2nd ed. 1996
2P The Analysis of Spread Mooring Systems for Floating Drilling Units, 1st ed. 1984
3 Recommended Practice for Cable Drilling and Fishing Tools, 1st ed. 1928, 2nd ed. 1988
4 Standard Rigs and Derricks, 2nd ed. 1934-13th ed. 1947
4A Steel Derricks (Including Standard Rigs), 14th ed. 1952-16th ed. 1967
4B Wooden Derricks, 14th ed. 1952
4C Rig Irons, 8th ed. 1939
4D Guyed Portable Masts, 1st ed. 1952-6th ed. 1967
Historical Publications

Fax Orders: 303-397-2740
Online Orders: www.global.ihs.com

5  Care and Use of Oil Country Tubular Goods, 1st ed. 1929
5A2 High-Pressure Thread Compound, 1st ed. 1952–5th ed. 1972
5A4 Care and Use of Reinforced Thermosetting Resin Casing and Tubing, 1st ed. 1976
5A9 Q125 Casing, 1st ed. 1985, 2nd ed. 1987
5C4 Round Thread Casing Joint Strength with Combined Internal Pressure and Bending, 2nd ed. 1987
5CTM Casing and Tubing (Metric Units), 5th ed. 1995
5D Conversion of English to Metric Units as Applicable to API Standards on Tubular Goods, 1st ed. 1960
5G1 Iron and Steel Flanged Gate, Plug, and Check Valves for Pipe Line Service, 4th ed. 1946
5G2 Steel Flanged Gate and Plug Valves for Drilling and Production Service, 5th ed. 1946
5L4 Care and Use of Reinforced Thermosetting Resin Line Pipe, 1st ed. 1972, 2nd ed. 1976
5L5 Marine Transportation of Line Pipe, 1st ed. 1975
5L6 Transportation of Line Pipe on Inland Waterways, 1st ed. 1979
5L9 Aluminum Alloy Line Pipe, 1st ed. 1962
5LX High-Test Line Pipe, 1st ed. 1948–24th ed. 1982
5UO1 Voluntary Unit Agreement, 4th ed. 1993
5UO2 Voluntary Unit Operating Agreement, 4th ed. 1993
5UO3 Statutory Unit Agreement, 2nd ed. 1993
5UO4 Statutory Unit Operating Agreement, 2nd ed. 1993
6  Rig Irons, 1st ed. 1929
6A  Safe Practices in Well-Pulling Operations, 1956
6AB 30,000 PSI Flanged Wellhead Equipment, 1st ed. 1983
6A4 Specification for Repair and Remanufacture of Wellhead and Christmas Tree Equipment, 1st ed. 1988
6CM Flanged Steel Gate and Plug Valves for Multiple Parallel String Completions in Production Service, 1st ed. 1960
6H Specification on End Closures, Connectors, and Swivels, 2nd ed. 1998
6T  Referenced Standards for Committee 6, Standardization of Valves and Wellhead Equipment, 1st ed. 1990
7  Transmission Standard, 1st ed. 1922–6th ed. 1944
7A Recommended Practice for Hard Facing Rotary Bits, 1st ed. 1932
7C-11F Installation, Maintenance, and Operation of Internal-Combustion Engines, 2nd ed. 1955–8th ed. 1994
7C11G Rating of Drilling and Production Hoisting Equipment, 1st ed. 1949
7D Oil-Field Boilers, 10th ed. 1949
7E Care and Use of Oil-Field Boilers, 3rd ed. 1949
7I Specification for Drill Pipe/Casing Protectors (DP/CP), 1st ed. 1985
8B Internal-Combustion Engines and Unit-Type Radiator Coolers and Oil-Field Service, 8th ed. 1953
10  Safe Practices in Drilling Operations, 1953
11A Care and Use of Oil Well Pumps, 1st ed. 1927–7th ed. 1944
11B Installation, Operation and Care of Oil Field Gas Engines, 1st ed. 1933
11C Internal Combustion Engine and Clutches for Oil Field Service, 1st ed. 1927–5th ed. 1942
11D Miscellaneous Pumping Equipment, 1st ed. 1923–7th ed. 1964
11D1 Specification for Packers and Bridge Plugs, 1st ed. 2002
11G Rating of Sucker Rod and Tubing Hoisting Equipment, 2nd ed. 1941
11H Recommended Practice for Electrical Surface Pumping Equipment, 1st ed. 1959
11J Recommended Practice for Placement of Electrical Equipment on Production Leases, 1st ed. 1961
11L4 Curves for Selecting Beam Pumping Units, 1st ed. 1970
11M Recommended Practice for Grounded 830-Volt, Three-Phase Electrical System for Oil Field Service, 1st ed. 1973
11PT Recommended Practice for Packaged Combustion Gas Turbines, 1st ed. 1992
11R Recommended Practice for Electric Submersible Pump Installations, 1st ed. 1980–2nd ed. 1986
11T Recommended Practice for Installation and Operation of Wet Steam Generators, 1st ed. 1983, 2nd ed. 1994

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<tr>
<td>12H Recommended Practice for Installation of New Bottoms in Old Storage Tanks, 1st ed. 1957</td>
<td>45 Testing Foam Agents for Mist Drilling, 1st ed. 1966</td>
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<td>15L4 Care and Use of Reinforced Thermosetting Resin Line Pipe, 2nd ed. 1976</td>
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<td>16E Design of Control Systems for Drilling Well Control Equipment, 1st ed. 1990</td>
<td>D2A Vocational Training in Oil and Gas Production, 1st ed. 1940, 2nd ed. 1943</td>
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<td>26 Form of Agreement and Specifications for Pipe Line Crossings under Railroad Tracks, 1st ed. 1935</td>
<td>D6 Selection and Evaluation of Well-Completion Methods, 1st ed. 1955</td>
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<td>28 Code of Metallurgical Terms for Ferrous Alloys, 1st ed. 1937</td>
<td>D8 A Tabular Method for Determining the Change of the Overall Angle and Dog Leg Severity (for Hole Inclinations up to 70 degrees), 1st ed. 1964</td>
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D10 Selecting Rotary Drilling Equipment, 1st ed. 1965, 2nd ed. 1973
D11 Glossary of Drilling-Fluid and Associated Terms, 1st ed. 1965, 2nd ed. 1979
D12 Well Data Glossary, 1st ed. 1966
D12A The API Well Number and Standard State and County Codes, 1st ed. 1968
D13 Installation and Use of Blowout-Preventer Stacks and Accessory Equipment, 1st ed. 1966
D15 Recommendations for Proper Usage and Handling of Inhibited Oilfield Acids, 1st ed. 1973
D18 Environmental Protection Laws and Regulations Related to Exploration, Drilling, Production, and Gas Processing Plant Operations, 1st ed. 1975
D19 Summary and Analysis of API Onshore Drilling Mud and Produced Water Environmental Studies, 1st ed. 1983
D20 Bulletin on Directional Drilling Survey Calculation Methods and Terminology, 1st ed. 1985
S2 Publications of the API Division of Production, 26th ed. 1948–62nd ed. 1985
T1 Function and Procedure of Committees on Training of the Division of Production, 5th ed. 1967
T3 Vocational Training Courses, 1st ed. 1959
T4 Supervisory Development Services Available from Public and Private Agencies and Institutions, 1st ed. 1953
T3 Training and Qualification of Personnel in Well Control Equipment and Techniques for Drilling on Offshore Locations, 1st ed. 1976
V2 Organization and Teaching of Courses on Specialized Vocational Training In the Production of Oil and Gas, 1st ed. 1949
V3 Information Bulletin Special Training Available for Leaders on Conduct of Foremanship Training Conferences, 1st ed., 1951

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Biological Treatment of Petroleum Refinery Wastes, 1st ed. 1963
Section II Waste Gases and Vapors 1st ed. 1931–5th ed. 1957
Section IV Sampling and Analysis of Waste Water, 1st ed. 1953
Section V, Sampling and Analysis of Waste Gas and Particulate Matter, 1st ed. 1954
Section VI, Disposal of Refinery Wastes, 1st ed. 1963

Inspection of Refinery Equipment, 1985
Chapter 1, Guide for Inspection of Refinery Equipment, 1976
Chapter 3, Inspection Planning, 1985
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Chapter 5, Preparation of Equipment for Safe Entry and Work, 1978
Chapter 6, Pressure Vessels (Towers, Drums, and Reactors), 1982
Chapter 9, Fired Heaters and Stacks, 1981
Chapter 10, Pumps, Compressors, and Blowers, and Their Drives
Chapter 11, Pipe, Valves, and Fittings, 1974
Chapter 13, Atmospheric and Low-Pressure Storage Tanks, 1981
Chapter 14, Electrical Systems, 1982
Chapter 15, Instruments and Control Equipment, 1981
Chapter 16, Pressure-relieving Devices, 1985

Chapter 17, Auxiliary and Miscellaneous Equipment, 1978
Chapter 18, Protection of Idle Equipment, 1982
Chapter 20, Inspection for Fire Protection, 1961

Manual for the Prevention of Water Pollution During Marine Oil Terminal Transfer Operations, 1st ed. 1964
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Chapter 1, Introduction, 1969
Chapter 2, Information on Water Pollution, 1969
Chapter 3, Collection and Treatment, 1969
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Chapter 5, Oil Water Separator Process Design, 1969
Chapter 6, Construction Details of Gravity-Type Separators
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Chapter 11, Oxidation, 1969
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Chapter 13, Biological Treatment, 1975
Chapter 14, Disposal by Sale, at Sea, in Wells, and Incineration, 1969
Chapter 15, Common Refinery Wastes and Process Summaries, 1969
Chapter 16, Petrochemical Waste Treatment, 1969
Chapter 17, Monitoring, 1969
Chapter 18, Diffusion of Effluent into Receiving Waters, 1969
Chapter 19, Stream Survey Methods, 1969
Chapter 20, Solubility and Toxicity Data, 1969
Chapter 21, Handling Stormwater Runoff, 1980
“Responding to a Pipeline Emergency” Videotape
500 Classification of Areas for Electrical Installations in Petroleum Refineries, 1st ed. 1955–4th ed. 1987
500C Recommended Practice for Classification of Areas for Electrical Installations at Petroleum and Gas Pipeline Transportation Facilities, 1st ed. 1966 to 1984
525 Testing Procedure for Pressure-Relieving Devices Discharging Against Variable Back Pressure, 1st ed. 1960
528 API Standard for Safety Relief Valve Nameplate Nomenclature, 1st ed. 1964
532 Measurement of the Thermal Efficiency of Fired Process Heaters, 1st ed. 1982
533 Air Preheat Systems for Fired Process Heaters, 1st ed. 1986
542 Grouped Motor Controller Specification-Low Voltage (600 Volts), 1st ed. 1977
543 Medium Voltage Motor Controllers, 1st ed. 1976
544 Metal-Clad Switchgear Specification-5kV to 15 kV, 1st ed. 1980
Part 1-Process Instrumentation and Control
Section 1, Flow, 3rd ed. 1974, 4th ed. 1986
Section 2, Level, 4th ed. 1980
Section 4, Pressure, 3rd ed. 1974, 4th ed. 1980
Section 6, Control Valves and Accessories, 3rd ed. 1976, 4th ed. 1985
Section 7, Transmissions Systems, 3rd ed. 1974
Section 12, Control Centers, 3rd ed. 1977
Section 14, Process Computer Systems, 1st ed. 1982
550 Part II–Process Stream Analyzers
Section 1, Analyzers, 4th ed. 1985
Section 2, Process Chromatographs, 4th ed. 1981
Section 4, Moisture Analyzers, 4th ed. 1983
Section 5, Oxygen Analyzers, 4th ed. 1983
Section 6, Analyzers for the Measurement of Sulfur and Its Components, 4th ed. 1984
Section 7, Electrochemical Liquid Analyzers, 4th ed. 1984
Section 9, Water Quality Analyzers, 4th ed. 1984
Section 10, Area Safety Monitors, 4th ed. 1983
550 Part III, Fired Heaters and Inert Gas Generators, 3rd ed. 1985
589 Fire Test for Evaluation of Valve Stem Packing, 2nd ed. 1998
590 Steel Line Blanks, 1st ed. 1985
595 Cast-Iron Gate Valves, Flanges Ends, 2nd ed. 1979
600A API Standard on Flanged Steel Outside–Screw–and Yoke Wedge Gate Valves, 1st ed. 1942
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665 API Fired Heater Data Sheet, 1st ed. 1966
680 Packaged Reciprocating Plant and Instrument Air Compressors for General Refinery Services, 1st ed. 1987
753 How to Install and Validate Employee Selection Techniques, 1st 1971
754 Validity Study Results for Jobs Relevant to the Petroleum Refining Industry, 1st 1972
755 Interpretive Guide for the API Test Validity Generalization Project, 1st, 1980, 2nd 1982
756 Recommended Guidelines for Documentation of Training, 1st 1977
757 Training and Materials Catalog, 1st 1979
758 Safety Digest of Lessons Learned
Section 1, General Safety Precautions in Refining 1986
Section 2, Safety in Unit Operations, 1979
Section 3, Safe Operations of Auxiliaries, 1980
Section 4, Safety in Maintenance, 1981
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Section 7, Safe Handling of Petroleum Products, 1983
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Section 9, Precautions Against Severe Weather Conditions, 1983
850 API Standards 620, 650, and 653 Interpretations—Tank Construction and In-Service Inspection, 1st ed. 1997
920 Prevention of Brittle Fracture of Pressure Vessels, 1st ed. 1990
928 Hydrocarbon Emissions from Refineries, 1st ed. 1973
940 Steel Deterioration in Hydrogen, 1st ed. 1967
943 High-Temperature Crude Oil Corrosivity Studies, 1st ed. 1974
947 Granular Media Filtration of Petroleum Refinery Effluent Waters, 1st ed. 1975
948 A Study of Variables that Affect the Corrosion of Water Strippers, 1st ed. 1976
949 Water Reuse Studies, 1st ed. 1977
952 Gaussian Dispersion Models Applicable to Refinery Emission, 1st ed. 1972
954 Evaluation of Ammonia “Fixation” Components in Actual Refinery Sour Waters, 1st ed. 1978
955 A New Correlation of NH₃, CO₂, and H₂S Volatility Data from Aqueous Sour Water Systems, 1st ed. 1978
956 Hydrogen-Assisted Crack Growth in 2 ½ Cr-½ Mo Steel, 1st ed. 1978
960 Evaluation of the Principles of Magnetic Water Treatment, 1st ed. 1985
1210 Training Competencies, 1st ed. 1994
1220 Guidelines for Evaluating Vendors and Training Programs. 1st ed. 1998

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Proceedings of the 1992 API Tanker Conference
Training and Qualification of Liquid Pipeline Maintenance Personnel 1st ed. 1992
998 Technical Data Book–Petroleum Refining, Metric ed.
1001 API Specifications for Tank Vehicles, 1st ed. 1937, 2nd ed. 1946
1006 The Loading and Unloading of Unleaded Gasoline by Tank Motor Vehicles, 1st ed. 1974
1011 Measurement of Petroleum Liquid Hydrocarbons by Positive Displacement Meter, 1st ed. 1960
1015 Bulletin on Construction Practices for Oil and Products Pipe Lines, 1st ed. 1955
1016 Bulletin on a Classification of Communications Circuits for Use in Automation in the Oil Industry, 1st ed. 1959, 2nd ed. 1961
1118 Training and Qualification of Liquid Pipeline Controllers, 1st ed. 1991
1120 Training and Qualification of Liquid Pipeline Operators, 1st ed. 1991
1122 Emergency Preparedness and Response for Hazardous Liquids Pipelines, 1st 1991
1123 Development of Public Awareness Programs by Hazardous Liquid Pipeline Operators, 2nd ed. 1996
1129 Assurance of Hazardous Liquid Pipeline System Integrity, 1st ed. 1996
1132 Effects of Oxygenated Fuels and Reformulated Diesel Fuels on Elastomers and Polymers in Pipeline/Terminal Components, 1994
1140 Guidelines for Developing Bridge Management Teams, 1st ed. 1991
1157 Hydrostatic Test Water Treatment and Disposal Options for Liquid Petroleum Systems, 1st ed. 1998
1164 SCADA Security, 1st ed. 2004
1201 Code for Tank Car Quantities or Code for Calibrating Tank Car Tanks and for Measuring, Sampling and Calculating Tank Car Quantities (Non-Pressure Type), 1st ed. 1948, 2nd ed. 1957
1202 Code for Pressure Tank Car Quantities or Code for Calibrating Tank Car Tanks and for Measuring, Sampling and Calculating Tank Car Quantities (Pressure Type), 1st ed. 1951, 2nd ed. 1960

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<td>June 24–28</td>
<td>Exploration and Production Standards Conference</td>
<td>Washington, DC</td>
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<tr>
<td>on Oilfield Equipment and Materials</td>
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<tr>
<td>July 16–17</td>
<td>API Offshore Safety and Lifting Conference &amp; Expo</td>
<td>Houston, TX</td>
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<tr>
<td>September 9–13</td>
<td>API Beijing</td>
<td>Beijing, China</td>
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<tr>
<td>October 1–2</td>
<td>Pipeline Information Exchange and Risk Workshop</td>
<td>Houston, TX</td>
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<tr>
<td>October 8</td>
<td>Pipeline Public Awareness Workshop</td>
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<td>October 9</td>
<td>Pipeline Damage Prevention Workshop</td>
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<tr>
<td>October 14–18</td>
<td>Fall Committee on Petroleum Measurement Standards Meeting</td>
<td>San Francisco, CA</td>
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<tr>
<td>October 15</td>
<td>API/AOPL Control Room Forum</td>
<td>San Antonio, TX</td>
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<tr>
<td>October 21–24</td>
<td>Storage Tank Conference and Safe Tank Entry Workshop</td>
<td>San Francisco, CA</td>
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<tr>
<td>November 11–15</td>
<td>Fall Refining and Equipment Standards Meeting</td>
<td>New Orleans, LA</td>
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<tr>
<td>November 11–13</td>
<td>Cybersecurity Conference for the Oil and Gas Industry</td>
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<tr>
<td>November 12</td>
<td>Fall API/AFPM Operating Practices Symposium</td>
<td>New Orleans, LA</td>
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<tr>
<td>January 20–24</td>
<td>Exploration and Production Winter Standards Meeting</td>
<td>Addison, TX</td>
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<tr>
<td>January 22–23</td>
<td>API/AGA Joint Committee on Pipeline Welding Practices</td>
<td>Addison, TX</td>
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<tr>
<td>January 30</td>
<td>Offshore Well Control Equipment Forum</td>
<td>New Orleans, LA</td>
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<tr>
<td>March 17–21</td>
<td>Spring Committee on Petroleum Measurement Standards Meeting</td>
<td>Dallas, TX</td>
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<tr>
<td>March 30 to April 1</td>
<td>International Trade and Customs Conference</td>
<td>Galveston, TX</td>
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<td>April 8–10</td>
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<tr>
<td>April 28–29</td>
<td>80th API Federal Tax Forum</td>
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<tr>
<td>May 5–8</td>
<td>International Oil Spill Conference</td>
<td>Savannah, GA</td>
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<td>May 19–21</td>
<td>Spring Refining and Equipment Standards Meeting</td>
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<td>June 25–26</td>
<td>Tanker Conference</td>
<td>Austin, TX</td>
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<td>October 6–10</td>
<td>Fall Committee on Petroleum Measurement Standards Meeting</td>
<td>Westminster, CO</td>
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<td>Exploration and Production Winter Standards Meeting</td>
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<tr>
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<td>Fall Committee on Petroleum Measurement Standards Meeting</td>
<td>Los Angeles, CA</td>
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