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API is pleased to present its 2017 publications programs and services catalog.

The 2017 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, and 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, eBusiness, 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 all segments of the oil and natural gas industry.

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

Sincerely,

Lakshmy A. Mahon
Director, Global Industry Services
API
# 2017 Publications Programs and Services

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API provides the public with online access to nearly 200 key industry standards via our IBR (Incorporated by Reference) Reading Room. These standards cover all aspects of the oil and gas industry, including process safety, refinery and chemical plant operations and equipment, offshore drilling, hydraulic fracturing and well construction, and pipeline safety on welding, and public awareness programs. API’s goal is to provide the public with access to these standards, particularly those related to safety or that have been incorporated into federal regulation.

Please view the read-only publications at http://publications.api.org. (Internet Explorer is the recommended browser for viewing the documents.)

The standards are available for review only. Print and PDF versions continue to be available for purchase at the API Publications Store at http://www.techstreet.com/api.
**GENERAL: OIL FIELD EQUIPMENT AND MATERIALS**

The API Composite List

This is a directory of companies licensed to use the API Monogram and APIQR Registration Mark. This directory also lists the companies who have registered Perforator Designs with API. It provides an alphabetical list of approximately 1,400 manufacturers licensed (at the time of publication) to mark their products with the API Monogram. It also contains a classified listing (by specific API specification) of these licensed manufacturers, as well as over 200 APIQR ISO 9000 registered firms. This directory was developed to assist those individuals desiring to purchase products and services meeting API specifications from companies whose quality systems and capabilities are verified by API’s Quality Programs. It is updated and published quarterly.

A searchable on-line version of the composite list is updated weekly and can be found at https://mycerts.api.org/Search/CompositeSearch.

Free*

**Spec Q1**

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

(includes Errata 1 dated February 2014, Errata 2 dated March 2014, and Addendum 1 dated June 2016)

Establishes the minimum quality management system requirements for organizations that manufacture products or provide manufacturing-related processes under a product specification for use in the petroleum and natural gas industry. This specification specifies requirements of a quality management system for an organization to demonstrate its ability to consistently provide reliable products and manufacturing-related processes that meet customer and legal requirements. This specification specifies requirements of a quality management system for an organization to demonstrate its ability to consistently provide reliable products and manufacturing-related processes that meet customer and legal requirements. The quality management system requirements specified in this specification are in alignment with the clause requirements and format of document used for the provision of services and use of service-related product (API Q2). Pages: 47

9th Edition | June 2013 | Effective Date: June 1, 2014
Product Number: G0Q109 | Price: $120.00

**Spec Q1**

Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry—Chinese

Chinese translation of Spec Q1.

9th Edition | June 2013 | Product Number: G0Q109C | Price: $84.00

**Spec Q1**

Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry—Portuguese

Portuguese translation of Spec Q1.

9th Edition | June 2013 | Product Number: G0Q109P | Price: $120.00

**Spec Q2**

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

(includes Addendum 1 dated June 2016)

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

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

**Spec Q2**

Specification for Quality Management System Requirements for Service Supply Organization for the Petroleum and Natural Gas Industries—Portuguese

Portuguese translation of Spec Q2.

1st Edition | December 2011 | Product Number: G0Q201P | Price: $80.00

**Spec Q2**

Specification for Quality Management System Requirements for Service Supply Organization for the Petroleum and Natural Gas Industries—Russian

Russian translation of Spec Q2.

1st Edition | December 2011 | Product Number: G0Q201R | Price: $64.00

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Applications of 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 that 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: G1FSC01 | Price: $60.00

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

Focuses on an evaluation process for HPHT equipment in the petroleum and natural gas industries that 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 where HPHT environments are intended to mean one or more of the following well conditions exist:

- the completion of the well requires completion equipment or well control equipment assigned a pressure rating greater than 15,000 psig; and a temperature rating greater than 350 °F;
- the maximum anticipated surface pressure or shut-in tubing pressure is greater than 15,000 psig on the seafloor 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 at the surface for a well with a subsurface wellhead 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 should be used as a guide by the various API standards committees to develop future documents 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: G1PER15K11 | Price: $147.00

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appliances (life boats or life rafts) are not included in the scope of this
pre-use inspection and testing of temporary cranes (also called self-erecting,
construction of structures in accordance with RP 2A-WSD, 22nd Edition and
ups in elevated condition is only covered to the extent that the requirements
structures are also briefly discussed. The site-specific assessment of jack-
effects of seismic events on floating structures and partially buoyant
are applicable to fixed steel structures and fixed concrete structures. The
The intent of the modification is to map the requirements of ISO 19901-2
to the United States’ offshore continental shelf (U.S. OCS). The requirements
specification for offshore structures and is a modified adoption of ISO 19901-2.
contains requirements for defining the seismic design procedures and
includes Errata 1 dated March 2013)
Provides requirements for design, construction, and testing of offshore
designed in this specification as pedestal mounted elevating and rotating lift devices for transfer of
materials or personnel to or from marine vessels and structures. Offshore
cranes are typically mounted on a fixed (bottom supported) or floating
platform structure used in drilling and production operations. Spec 2C is not
intended to be used for the design, fabrication, and testing of davits and/or
emergency escape devices. Spec 2C is also not intended to be used for
shipboard cranes or heavy lift cranes. Pages: 124
7th Edition | March 2012 | Effective Date: October 1, 2012
Product Number: G02C07 | Price: $143.00
Spec 2C *
Offshore Pedestal-Mounted Cranes—Chinese
Chinese translation of Spec 2C.
7th Edition | March 2012 | Product Number: G02C07C | Price: $101.00
RP 2D
Operation and Maintenance of Offshore Cranes
(includes Errata 1 dated August 2015)
Intended to serve as a guide to crane owners and operators in developing
operating and maintenance practices and procedures for use in the safe
operation of pedestal-mounted revolving cranes on fixed or floating offshore
platforms, jackup drilling rigs, semi-submersible drilling rigs and other types
of mobile offshore drilling units (MODUs). Guidelines are also given for the
pre-use inspection and testing of temporary cranes (also called self-erecting,
leapfrog or bootstrap cranes) that are erected offshore.
Equipment (e.g. davits, launch frames) used only for launching life-saving
appliances (life boats or life rafts) are not included in the scope of this
document. Pages: 120
7th Edition | December 2014 | Product Number: G02D07 | Price: $145.00
RP 2EQ/ISO 19901-2:2004
Seismic Design Procedures and Criteria for Offshore Structures
Contains requirements for defining the seismic design procedures and
criteria for offshore structures and is a modified adoption of ISO 19901-2.
The intent of the modification is to map the requirements of ISO 19901-2 to
the United States’ offshore continental shelf (U.S. OCS). The requirements
are applicable to fixed steel structures and fixed concrete structures. The
effects of seismic events on floating structures and partially buoyant
structures are also briefly discussed. The site-specific assessment of jack-
ups in elevated condition is only covered to the extent that the requirements
are applicable. This document defines the seismic requirements for new
construction of structures in accordance with RP 2A-WSD, 22nd Edition and
later. Earlier editions of RP 2A-WSD are not applicable. Only earthquake-
induced ground motions are addressed in detail. Other geologically induced
hazards such as liquefaction, slope instability, faults, Tsunamis, mud
volcanoes, and shock waves are mentioned and briefly discussed. The
requirements are intended to reduce risks to persons, the environment, and
assets to the lowest levels that are reasonably practicable.
This edition of RP 2EQ is the modified national adoption of ISO 19901-
2:2004. Pages: 54
1st Edition | November 2014 | Product Number: G62EQ01 | Price: $125.00
Spec 2F *
Specification for 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: $99.00
Spec 2F *
Specification for 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 the 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 experienced in performing hazard analysis as
described in RP 14L, 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, product storage, and export. This document
addresses only floating systems where a buoyant hull of some form supports
the deck, production, and other systems. Bottom-fixed components, such as
self-supporting risers, and station keeping systems, such as turret mooring,
catenary anchor leg mooring (CALM), single anchor leg mooring (SALM), etc.
are considered as ancillary components and are addressed in more detail in
other API recommended practices. Pages: 191
2nd Edition | October 2011 | Product Number: G2FPS02 | Price: $186.00
RP 2GEO/ISO 19901-4:2003
Geotechnical and Foundation Design Considerations
(includes Addendum 1 dated October 2014)
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.
This edition of RP 2GEO is the modified national adoption of ISO 19901-
4:2003. Pages: 103
1st Edition | April 2011 | Product Number: G62GEO01 | Price: $154.00

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Spec 2H ◆
**Specification for Carbon Manganese Steel Plate for Offshore Structures**

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: 14

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 special inspections is to determine if a structure sustained hurricane-induced damage that affects the safety of personnel, the primary structural integrity of the asset, or its ability to perform the purpose for which it was intended. This document should be used in conjunction with the applicable API 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. This edition includes:

- inspection guidelines for steel permanent moorings on permanent floating installations are added;
- inspection guidelines for fiber ropes used for permanent and MODU moorings 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 (DP) vessel harbor mooring. The applicability of this document to other floating vessels and moorings is left to the discretion of the user. Pages: 73

3rd Edition | April 2008 | Reaffirmed: June 2015
Product Number: G02I03 | Price: $148.00

RP 2L
**Recommended Practice for 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: $83.00

RP 2MET/ISO 19901-1:2006
**Deprivation of Metocean Design and Operating Conditions**

Contains general requirements for the determination and use of meteorological and oceanographic (metocean) conditions for the design, construction, and operation of offshore structures in the petroleum and natural gas industries.

The requirements are divided into two broad types:

- those that relate to the determination of environmental conditions in general, together with the metocean parameters that are required to adequately describe them;
- those that relate to the characterization and use of metocean parameters for the design, the construction activities or the operation of offshore structures.

The environmental conditions and metocean parameters discussed in this document comprise the following:

- extreme and abnormal values of metocean parameters that recur with given return periods that are considerably longer than the design service life of the structure,
- long-term distributions of metocean parameters, in the form of cumulative, conditional, marginal, or joint statistics of metocean parameters, and
- normal environmental conditions that are expected to occur frequently during the design service life of the structure.

Metocean parameters are applicable to:

- the determination of actions and action effects for the design of new structures,
- the determination of actions and action effects for the assessment of existing structures,
- the site-specific assessment of mobile offshore units,
- the determination of limiting environmental conditions, weather windows, actions and action effects for pre-service and post-service situations (i.e. fabrication, transportation, and installation or decommissioning and removal of a structure), and
- the operation of the platform, where appropriate.

This edition of RP 2MET is the modified national adoption of ISO 19901-1:2006. Pages: 168

1st Edition | November 2014
Product Number: GG2MET01 | Price: $200.00

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

(includes Errata 1 dated April 2015)

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 RP 2MOP is the identical national adoption of ISO 19901-6:2009. Pages: 168

1st Edition | July 2010 | Reaffirmed: April 2015
Product Number: GG2MOP01 | Price: $243.00

Spec 2MT1 ◆
**Specification for 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. Spec 2H, 2W, and 2Y cover other steels providing improved mechanical properties and toughness for Class “A” applications and should be used where substantial z-direction stresses are expected. Pages: 6

2nd Edition | September 2001 | Effective Date: March 1, 2002
Reaffirmed: January 2012 | Product Number: G2MT12 | Price: $83.00
Exploration and Production

Fax Orders: +1 303 397 2740
Online Orders: global.ihs.com

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 AZ shapes may be specified, by agreement, using Supplement S101. Pages: 8
1st Edition | June 2002 | Effective Date: December 1, 2002
Reaffirmed: June 2015 | Product Number: G2MT21 | Price: $79.00

RP 2N/ISO 19906:2010
Planning, Designing, and Constructing Structures and Pipelines for Arctic Conditions
Specifies requirements and provides recommendations and guidance for the design, construction, transportation, installation, and removal of offshore structures, related to the activities of the petroleum and natural gas industries in arctic and cold regions. Reference to arctic and cold regions includes both the Arctic and other cold regions that are subject to similar sea ice, iceberg, and icing conditions. The objective of this standard is to ensure that offshore structures in arctic and cold regions provide an appropriate level of reliability with respect to personnel safety, environmental protection, and asset value to the owner, to the industry, and to society in general. This standard does not contain requirements for the operation, maintenance, service-life inspection, or repair of arctic and cold region offshore structures, except where the design strategy imposes specific requirements. While this standard does not apply specifically to mobile offshore drilling units, the procedures relating to ice actions and ice management contained herein are applicable to the assessment of such units. This standard does not apply to mechanical, process, and electrical equipment or any specialized process equipment associated with arctic and cold region offshore operations except in so far as it is necessary for the structure to sustain safely the actions imposed by the installation, housing, and operation of such equipment.

This edition of RP 2N is the modified national adoption of ISO 19906:2010. Pages: 458
3rd Edition | April 2015 | Product Number: G02N03 | Price: $199.00

Std 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 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 171. Pages: 81
2nd Edition | September 2013 | Product Number: G2RD02 | Price: $245.00

Bull 2S
Design of Windlass Wildcats for Floating Offshore Structures
Covers the design of windlass wildcats to ensure proper fit and function between wildcat and mooring chain. Wildcats are of the five-whelp type for use with studlink anchor chain conforming to the classification society Grades 1, 2, and 3, ORQ and Grade 4 chain. Wildcat dimensions are provided for chains in integral 1/8 in. (3 mm) steps, ranging in size from 2 in. to 4 in. (51 mm to 102 mm). Wildcat dimensions for chains 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 tenders, 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. TLPs and sparos), 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
Reaffirmed: June 2015 | Product Number: G2SC01 | Price: $114.00

Spec 2SF ◆ Manufacture of Structural Steel Forgings for Primary Offshore Applications
Forgings manufactured to this specification are intended for use in the fabrication of offshore structures, marine risers, TLP tendons and pipelines, or other system components intended for application on permanent offshore structures. This specification defines the minimum requirements for manufacture, testing, and inspection of carbon and low-alloy steel forgings, including extrusions and heavy-wall seamless tubular product, grades 345 N/mm² to 586 N/mm² (50 ksi to 85 ksi) for use in primary steel applications. Service categories A, B, and C (SCA, SCB, and SCC) reflect forging geometry and method of incorporation into the overall system, rather than levels of criticality. They may also be designated by the user (purchaser) to reflect moderately different but standardized levels of performance. Pages: 26
1st Edition | August 2013 | Product Number: G2SF01 | Price: $85.00

RP 2SIM
Structural Integrity Management of Fixed Offshore Structures
Serves as a guide for the structural integrity management of fixed offshore structures used for the drilling, development, production, and storage of hydrocarbons in offshore areas. Specific guidance is provided for the evaluation of structural damage, above and below water structural inspection, fitness-for-purpose assessment, risk reduction, and mitigation planning, and the process of decommissioning. The SIM process provided in this recommended practice is applicable to platforms installed at any location worldwide. However, this recommended practice also provides specific metocean criteria, which are only applicable for use in fitness-for-purpose assessments of platforms located in the U.S. Gulf of Mexico and the U.S. West Coast. Pages: 97
1st Edition | November 2014 | Product Number: G2SIM01 | Price: $170.00
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 that, when combined with an understanding of the environment at a particular location, the characteristics of the unit being moored, and other factors, can be used to determine the adequacy and safety of the mooring system. Some design guidelines for dynamic positioning systems are also included. Appendix K of 2SK replaces RP 95F. Pages: 181

Product Number: G2SK03 | Price: $127.00

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

Covers the design, manufacture, and installation of synthetic fiber ropes to include the design and analysis considerations of mooring systems, design criteria for mooring components, rope design and testing, quality assurance, and in-service maintenance and inspection.

This document applies to synthetic fiber ropes used in the form of taut leg or catenary moorings for both permanent and temporary offshore installations such as:
- monohull-based floating production, storage, and offshore units (FPSOs);
- monohull-based floating storage units (FSOs, FSUs);
- monohull or semi-submersible based floating production units (FPUs, FPSs);
- mobile offshore drilling units (MODUs);
- spar platforms;
- catenary anchor leg mooring (CALM) buoys;
- mobile offshore units. Pages: 108

2nd Edition | July 2014 | Product Number: G2SM02 | Price: $185.00

RP 2T
Planning, Designing and Constructing Tension Leg Platforms

Contains guidance on commonly used NDE methods such as visual (VT), penetrant (PT), magnetic particle (MT), radiography (RT), and ultrasonic (UT) examinations, which are routinely used 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: G02T0X | Price: $147.00

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

Addresses the need to evaluate the tie-downs in use on offshore production facilities for drilling rigs, permanent equipment, and facilities such as quartermasts, 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
Bulletin on 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 *
Specification for 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 *
Specification for 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 2X
Recommended Practice for Ultrasonic and Magnetic Examination of Offshore Structural Fabrication and Guidelines for Qualification of Technicians

Contains guidance on commonly used NDE methods such as visual (VT), penetrant (PT), magnetic particle (MT), radiography (RT), and ultrasonic (UT) examinations, which are routinely used 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**
**Recommendation Practice for Preproduction Qualification for Steel Plates for Offshore Structures**

Covers requirements for preproduction qualification, by special welding and mechanical testing, of specific steelmaking and processing procedures for the manufacture of steel of a specified chemical composition range by a specific steel producer. This is a recommended practice for material selection and qualification, but not for the performance of production weld joints. This recommended practice was developed in conjunction with, and is intended primarily for use with, Specs 2W and 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**

Presents an interim approach to siting jackup mobile offshore drilling units (MODUs) and to recommend certain operational procedures to enhance jackup survivability and stationkeeping during hurricane season in the Gulf of Mexico during drilling and workover and while stacked (idled) at a non-sheltered location. This RP provides guidance and processes, and when combined with an understanding of the environment at a particular location, the characteristics of the unit being utilized, and other factors, it may be used to enhance operational integrity. This RP was developed through a cooperative arrangement with the International Association of Drilling Contractors' (IADC) Jackup Rig Committee. Specifically, this RP provides guidance in the following areas:
- site—including location-specific, geotechnical, and metocean;
- preloading process;
- air gap recommendations;
- unit preparations and evacuation;
- post storm recovery; and
- post storm inspections. Pages: 15

Product Number: G95J01 | Price: $62.00

**DERRICKS AND MASTS**

**Spec 4F**
**Specification for Drilling and Well Servicing Structures** *(includes Addendum 1 dated December 2016)*

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 (PSLs) 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 Addendum 1 dated August 2016)*

Provides guidelines and establishes recommended procedures for inspection, maintenance, and repair of items for drilling and well servicing structures to maintain the serviceability of this equipment. These recommendations 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 are masts/ derricks, substructures, and their accessories. Pages: 57

Product Number: G04G04 | Price: $116.00

**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 RP 5A3 is the identical national adoption of ISO 13678:2010. Pages: 47

Product Number: GX5A303 | Price: $145.00

**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 (OCTG). This International Standard covers the practices and technology commonly used in field inspection; however, certain practices may also be suitable for mill inspections. Covers the qualification of inspection personnel, a description of inspection methods and apparatus calibration and standardization procedures for various inspection methods. The evaluation of imperfections and marking of inspected OCTG are included. Applicable to field inspection of OCTG and is not applicable for use as a basis for acceptance or rejection. This edition of RP 5A5 is the identical national adoption of ISO 15463:2003. Pages: 118

Product Number: GX5A507 | Price: $157.00

**RP 5A5/ISO 15463:2003** *
**Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe—Chinese**

Chinese translation of RP 5A5.

7th Edition | June 2005 | Product Number: GX5A507C | Price: $110.00

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Spec 5B *

Specification for Threading, Gauging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads—Chinese

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
Reaffirmed: April 2015 | Product Number: G5B015 | Price: $118.00

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

Spec 5B *

Specification for Threading, Gauging and Thread Inspection of Casing, Tubing, and Line Pipe Threads—Russian

Russian translation of Spec 5B.

15th Edition | April 2008 | Product Number: G05B15R | Price: $114.00

RP 5B1

Gauging and Inspection of Casing, Tubing and Line Pipe Threads (includes Addendum 1 dated September 2004)

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

Product Number: G05B105 | 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

RP 5B1 *

Gauging and Inspection of Casing, Tubing and Line Pipe Threads—Russian

Russian translation of RP 5B1.

5th Edition | October 1999 | Product Number: G05B15R | Price: $114.00

RP 5C1

Recommended Practice for Care and Use of Casing and Tubing

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

Product Number: G05C19 | Price: $115.00

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Spec 5CRA/ISO 13680:2008◆
Specification for Corrosion Resistant Alloy Seamless Tubes for Use as Casing, Tubing and Coupling Stock
(includes Errata 1 dated August 2011)
Specifies the technical delivery conditions for corrosion-resistant alloy seamless tubulars for casing, tubing, and coupling stock for two product specification levels.
This edition of Spec 5CRA is the identical national adoption of ISO 13680:2010. Pages: 87
1st Edition | February 2010 | Effective Date: August 1, 2010
Reaffirmed: April 2015 | Product Number: GG5CRA01 | Price: $155.00

Spec 5CT◆
Specification for Casing and Tubing
(includes Errata 1 dated September 2012 and Errata 2 dated October 2016)
Specifies the technical delivery conditions for steel pipes (casing, tubing, plain end casing liners, and pup joints) and accessories. This standard is applicable to the following connections in accordance with Spec 5B:
- short round thread casing (STC);
- long round thread casing (LC);
- buttress thread casing (BC);
- extreme-line casing (XC);
- non-upset tubing (NU);
- external upset tubing (EU);
- integral joint tubing (IJ).
This standard specifies the technical delivery conditions for steel pipes (casing, tubing, and pup joints), coupling stock, coupling material, and accessory material and establishes requirements for three Product Specification Levels (PSL-1, PSL-2, PSL-3). The requirements for PSL-1 are the basis of this standard. The requirements that define different levels of standard technical requirements for PSL-2 and PSL-3, for all grades except H-40, L-80 9Cr, and C110, are contained in Annex H. This standard can also be applied to tubulars with connections not covered by API standards. This standard is not applicable to threading requirements. This standard is based on the 8th Edition of Spec 5CT. Pages: 269
9th Edition | July 2011 | Effective Date: January 1, 2012
2-Year Extension: July 2016 | Product Number: G5CT09 | Price: $237.00

Spec 5CT◆
Specification for Casing and Tubing—Chinese
Chinese translation of Spec 5CT.
9th Edition | July 2011 | Product Number: G5CT09C | Price: $166.00

Spec 5CT◆
Specification for Casing and Tubing—Portuguese
Portuguese translation of Spec 5CT.
9th Edition | July 2011 | Product Number: G5CT09P | Price: $237.00

Spec 5CT◆
Specification for Casing and Tubing—Russian
Russian translation of Spec 5CT.
9th Edition | July 2011 | Product Number: G5CT09R | Price: $190.00

Spec 5CT◆
Specification for Casing and Tubing—Spanish
Spanish translation of Spec 5CT.
9th Edition | July 2011 | Product Number: G5CT09SP | Price: $237.00

Spec 5DP/ISO 11961:2008◆
Specification for Drill Pipe
Specifies the technical delivery conditions for steel drill-pipes with upset pipe-body ends and weld-on tool joints for use in drilling and production operations in petroleum and natural gas industries for three product specification levels (PSL-1, PSL-2, and PSL-3). This International Standard covers the following grades of drill-pipe:
- grade E drill-pipe;
- high-strength grades of drill-pipe, grades X, G, and S.
This International Standard can also be used for drill-pipe with tool joints not specified by ISO or API standards. This International Standard is based on Spec 5D and Spec 7.
This edition of Spec 5DP is the identical national adoption of ISO 11961:2008. Pages: 112
1st Edition | August 2009 | Effective Date: August 1, 2010
Reaffirmed: April 2015 | Product Number: GX5DP01 | Price: $181.00

Spec 5DP/ISO 11961:2008◆
Specification for Drill Pipe—Chinese
Chinese translation of Spec 5DP.
1st Edition | August 2009 | Product Number: GX5DP01C | Price: $127.00

Spec 5L◆
Specification for Line Pipe
(includes Errata 1 dated April 2015)
Specifies requirements for the manufacture of two product specification levels (PSL 1 and PSL 2) of seamless and welded steel pipes for use in pipeline transportation systems in the petroleum and natural gas industries. Pages: 180
45th Edition | December 2012 | Effective Date: July 1, 2013
Product Number: G05L45 | Price: $258.00

Spec 5L◆
Specification for Line Pipe—Chinese
Chinese translation of Spec 5L.
45th Edition | December 2012
Product Number: G05L45C | Price: $181.00

Spec 5L◆
Specification for Line Pipe—Portuguese
Portuguese translation of Spec 5L.
45th Edition | December 2012
Product Number: G05L45P | Price: $258.00

Spec 5L◆
Specification for Line Pipe—Russian
Russian translation of Spec 5L.
45th Edition | December 2012
Product Number: G05L45R | Price: $207.00

Spec 5L◆
Specification for Line Pipe—Spanish
Spanish translation of Spec 5L.
45th Edition | December 2012
Product Number: G05L45SP | Price: $258.00

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RP 5L1
Recommended Practice for Railroad Transportation of Line Pipe
Applies to the transportation on railcars of Spec 5L steel line pipe in sizes 2½" and larger in lengths longer than single random. These recommendations cover coated or uncoated pipe, but they do not encompass loading practices designed to protect pipe coating from damage. Pages: 5
Product Number: G5L107 | Price: $59.00

RP 5L2
Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service
Provides for the internal coating of line pipe used for non-corrosive natural gas service. It is limited to the application of internal coatings on new pipe prior to installation. Pages: 21
Product Number: G5L204 | Price: $83.00

RP 5L2 *
Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service—Chinese
Chinese translation of RP 5L2.
4th Edition | July 2002 | Product Number: G5L204C | Price: $59.00

RP 5L2 *
Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service—Kazakh
Kazakh translation of RP 5L2.

RP 5L2 *
Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service—Russian
Russian translation of RP 5L2.

RP 5L3
Drop-Weight Tear Tests on Line Pipe
Describes procedures for a recommended method for conducting drop-weight tear tests to measure the fracture appearance or fracture ductility of line pipe as referenced in Spec 5L. Pages: 11
4th Edition | August 2014 | Product Number: G5L304 | Price: $95.00

RP 5L7
Recommended Practice for Unprimed Internal Fusion Bonded Epoxy Coating of Line Pipe
Provides recommendations for materials, application, testing, and inspection of internal fusion bonded epoxy coatings on line pipe. Pages: 25
Product Number: G02906 | Price: $89.00

RP 5L7 *
Recommended Practice for Unprimed Internal Fusion Bonded Epoxy Coating of Line Pipe—Russian
Russian translation of RP 5L7.
2nd Edition | June 1988 | Product Number: G02906R | Price: $72.00

RP 5L8
Recommended Practice for Field Inspection of New Line Pipe
Covers the qualification of inspection personnel, a description of inspection methods, and apparatus calibration and standardization procedures for various inspection methods. The evaluation of imperfections and marking of inspected new line pipe are included. Also included are recommended procedures for field inspection and testing of new plain-end line pipe. This document was prepared specifically to address the practices and technology used in field inspection of line pipe, and certain parts are not suitable or appropriate for mill inspections. Pages: 39
Product Number: G05L82 | Price: $125.00

RP 5L8 *
Recommended Practice for Field Inspection of New Line Pipe—Kazakh
Kazakh translation of RP 5L8.
2nd Edition | December 1996
Product Number: G05L82K | Price: $100.00

RP 5L8 *
Recommended Practice for Field Inspection of New Line Pipe—Russian
Russian translation of RP 5L8.
2nd Edition | December 1996
Product Number: G05L82R | Price: $100.00

RP 5L9
External Fusion Bonded Epoxy Coating of Line Pipe
Provides standards for pipe suitable for use in conveying gas, water, and oil in both the oil and natural gas industries. Covers seamless and welded steel line pipe, including standard-weight and extra-strong threaded line pipe, and standard-weight plain-end, regular-weight plain-end, special plain-end, extra-strong plain-end, and double-extra-strong plain-end pipe, as well as bell and spigot and through-flowing (TFL) pipe. Pages: 35
Product Number: G5L901 | Price: $79.00

RP 5L9 *
External Fusion Bonded Epoxy Coating of Line Pipe—Kazakh
1st Edition | December 2001 | Product Number: G5L901K | Price: $64.00

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

Spec 5LC
CRA Line Pipe
(Includes Errata 1 dated October 2015)
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 as well as processes of manufacturer, chemical and physical requirements, and methods of testing. Pages: 110
Product Number: G5LCO4 | Price: $175.00

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10
**Recommended Practice for Transportation of Line Pipe**

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

Product Number: GSWL03 | Price: $59.00

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**Recommended Practice for Truck Transportation of Line Pipe**

Applies to the transportation on railcars of Spec 5L steel line pipe in sizes 2½/8 and larger in lengths longer than single random. These recommendations cover coated or uncoated pipe, but they do not encompass loading practices designed to protect pipe coating from damage. Pages: 6

1st Edition | March 2012 | Product Number: G5LT01 | Price: $59.00

**Recommended Practice for Truck Transportation of Line Pipe—Chinese**

Chinese translation of RP 5LT.

1st Edition | March 2012 | Product Number: G5LT01C | Price: $42.00

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**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

Product Number: G5LW03 | Price: $59.00

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**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 for the inspection of products from placement of the order or the pre-production meeting, as appropriate, through the point of title transfer from suppliers to purchasers. Pages: 7

Product Number: GSST01 | Price: $57.00

**Specification on Imperial Tuning of Line Pipe**

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

Product Number: GSST01 | Price: $134.00

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**Specification for RCA 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 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: 38

Product Number: G5LD04 | Price: $145.00

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**Specification for Coiled Line Pipe—Chinese**

Chinese translation of Spec 5LCP.

1st Edition | October 2006 | Product Number: G5LCP2C | Price: $103.00

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**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: G5ST01C | Price: $94.00

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

Chinese translation of Spec 5ST.

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

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**Standard on Imperfection Terminology**

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: GOST10 | Price: $115.00

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

Provides alternative connection assembly procedures to those found in Spec 5B (power turns) and those found in RP 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 Spec 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: GSTP01 | Price: $115.00

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for five product specification levels (PSL). These five PSL designations define tools, wear bushings). This document defines service conditions, in terms of hubs, pressure boundary penetrations, ring gaskets, running and testing and actuators, back-pressure valves); loose connectors (weld neck spools); casing and tubing hangers (mandrel hangers, slip hangers); valves connectors, tees and crosses, fluid-sampling devices, adapter and spacer 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 document defines service conditions, in terms of pressure, temperature, and material class for the well-bore constituents, and operating conditions. This International Standard establishes requirements for five product specification levels (PSL). These five PSL designations define different levels of technical quality requirements.

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TR 5STRS22
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, Std 5B, 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

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, and
- surface breaking and subsurface imperfections in the weld area of electric resistance, electric induction or laser welded pipe, and
- surface breaking and subsurface imperfections in the weld area of arc welded pipe. Pages: 22
Product Number: G5UE02 | Price: $79.00

VALVES AND WELLHEAD EQUIPMENT

Spec 6A/ISO 10423:2009
Specification for Wellhead and Christmas Tree Equipment
Specifies requirements and gives recommendations for the performance, dimensional and functional interchangeability, design, materials, testing, inspection, welding, marking, handling, storing, shipment, purchasing, repair, and remanufacture of wellhead and christmas tree equipment for use in the petroleum and natural gas industries. This document does not apply to field use, field testing, or field repair of wellhead and christmas tree equipment. This document 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 document defines service conditions, in terms of pressure, temperature, and material class for the well-bore constituents, and operating conditions. This International Standard establishes requirements for five product specification levels (PSL). These five PSL designations define different levels of technical quality requirements.

This edition of Spec 6A is the modified national adoption of ISO 10423:2009. Pages: 436
20th Edition | October 2010 | Effective Date: April 1, 2011
2-Year Extension: October 2012
Product Number: GX6A20 | Price: $260.00

Spec 6A/ISO 10423:2009
Specification for Wellhead and Christmas Tree Equipment—Chinese
Chinese translation of Spec 6A.
20th Edition | October 2010 | Product Number: GX6A20C | Price: $182.00

Std 6ACRA
Age-Hardened Nickel-Based Alloys for Oil and Gas Drilling and Production Equipment
(includes Errata 1 dated October 2015)
Provides requirements for age-hardened nickel-base alloys that are intended to supplement the existing requirements of Spec 6A. For downhole applications, refer to Spec SCRA.
These additional requirements include detailed process control requirements and detailed testing requirements. The purpose of these additional requirements is to ensure that the age-hardened nickel-base alloys used in the manufacture of Spec 6A pressure-containing and pressure-controlling components are not embrittled by the presence of an excessive level of deleterious phases and meet the minimum metallurgical quality requirements.
This standard is intended to apply to pressure-containing and pressure-controlling components as defined in Spec 6A. Requirements of this standard may be applied by voluntary conformance by a manufacturer, normative reference in Spec 6A or other product specification(s), or by contractual agreement.
This document expands the scope of Std 6A718. With its issuance, it replaces Std 6A718, 2nd Edition in its entirety. Pages: 33
1st Edition | August 2015 | Product Number: G6ACRA1 | $90.00

TR 6AF
Technical Report on Capabilities of API Flanges Under Combinations of Load
Presents the results of analysis work done in to establish the load capacity of all flanges give in the April 1986 editions of Spec 6A and Spec 6AB. A total of 69 different geometries were analyzed initially. The various loads considered were bolt makeup (preload), internal pressure, tension, and bending moment. All flanges were analyzed with an axisymmetric finite element model for each of the four load cases. A post-processor program was written to calculate the maximum moment capacity for various levels of load and tension, based on linear superposition of results. Three different criteria were used to establish the maximum moment:
- ASME Section VIII, Division 2 allowable stress categories for the flange with the basic membrane stress allowable established by API;
- allowable bolt stresses as established by API; and
- loss of preload on the ring joint.
The results of this post-processing are presented in plots of pressure vs. allowable moment for various tension levels. Limitations to this work include: the effects of transverse shear or torsion were not considered in the analysis; dynamic, fatigue, or fretting phenomena were not considered in these results; and thermal stresses or elevated temperature effects were not considered. The charts are intended to be used only as general guidelines for design. These charts are not intended to replace a critical evaluation of any particular connection in an application where the charts show the flange to be marginal. Pages: 79
3rd Edition | September 2008 | Product Number: G6AF03 | Price: $150.00

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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.
TR 6A1F
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) that resulted in the publication of Bull 6A1. Included in this technical report is an in-depth look into the effect of elevated temperatures of API flanges. The results in this report are analytical and assume a temperature gradient across the flange as stated in this report. Pages: 256
2nd Edition | November 1998 | Product Number: G06AF1 | Price: $157.00

TR 6A2F
Technical Report on Capabilities of API Integral Flanges Under Combination of Loading—Phase II

Result of the evaluation of 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
5th Edition | April 2013 | Product Number: G6AF25 | Price: $170.00

TR 6AM
Technical Report on Material Toughness

Includes CVN toughness requirement that can be used as a quality assurance measure in Spec 6A equipment to screen materials with poor notch toughness. Pages: 12
2nd Edition | September 1995 | Product Number: G06AM2 | Price: $76.00

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 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 II is 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. Previous editions of this document included reference to and requirements for verification to PR1, standard service (Class I). Pages: 25
2nd Edition | February 2013 | Product Number: G6AV102 | Price: $80.00

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

Russian translation of Spec 6AV1. Pages: 12
2nd Edition | February 2013 | Product Number: G6AV102R | Price: $64.00

Spec 6AV2
Installation, Maintenance and Repair of Surface Safety Valves and Underwater Safety Valves Offshore (includes Errata 1 dated August 2014)

Provides requirements for installing and maintaining surface safety valves (SSV) and underwater safety valves (USV). Included are requirements for receiving inspection, installation and maintenance, field and offsite repair, testing procedures with acceptance criteria, failure reporting, and documentation. Power and control systems for SSV/USVs are not included. This document is applicable to SSVs/USVs used or intended to be used as part of a safety system, as defined by documents such as RP 14C. This standard is the revision of and supersedes RP 14H, 5th Edition. Pages: 29
1st Edition | March 2014 | Product Number: G6AV201 | Price: $135.00

Spec 6D◆
Specification for Pipeline and Piping Valves

Specifies requirements and provides recommendations for the design, manufacturing, testing, and documentation of ball, check, gate, and plug valves for application in pipeline systems meeting ISO 13823 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). Pages: 108
24th Edition | August 2014 | Effective Date: August 1, 2015 | Product Number: G6D024 | Price: $150.00

Spec 6D◆
Specification for Pipeline and Piping Valves—Chinese

Chinese translation of Spec 6D. Pages: 108
24th Edition | August 2014 | Product Number: G6D024C | Price: $105.00

Spec 6D◆
Specification for Pipeline and Piping Valves—Russian

Russian translation of Spec 6D. Pages: 108
24th Edition | August 2014 | Product Number: G6D024R | Price: $120.00

RP 6DR
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 Spec 6D. This RP covers repair or remanufacturing of end user's (owner's) valves for continued service in the owner's production applications. Repaired or remanufactured valves may not meet API and/or the OEM standard requirements for new values. The owner is responsible for the correct application of valves repaired or remanufactured per this document. It does not cover repair or remanufacture of used or surplus valves intended for resale. Furthermore, field repair is outside the scope of this document. Pages: 11
2nd Edition | May 2012 | Product Number: G06DR2 | Price: $78.00

RP 6DR◆
Recommended Practice for the Repair and Remanufacture of Pipeline Valves—Russian

Russian translation of Spec RP 6DR. Pages: 11
2nd Edition | May 2012 | Product Number: G06DR2R | Price: $63.00

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Exploration and Production

**Spec 6DSS/ISO 14723:2009**
Specification for Subsea Pipeline Valves
(includes Errata 1 dated August 2007 and Errata 2 dated November 2010)

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

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

2nd Edition | December 2009 | Effective Date: June 1, 2010
2-Year Extension: June 2014 | Product Number: GX6DSS2 | Price: $165.00

**Spec 6DSS/ISO 14723:2009**
Specification for Subsea Pipeline Valves—Chinese

Chinese translation of Spec 6DSS.


**Std 6DX/ISO 12490:2011**
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 Spec 6D. It 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 subsea service, handheld powered devices, stand-alone manually operated gearboxes, instrument tubing and associated fittings, and actuator control equipment.

This edition of Std 6DX is the identical national adoption of ISO 12490:2011. Pages: 51

1st Edition | October 2012 | Product Number: GG6DX01 | Price: $131.00

**TR 6F1**

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 prediction. Pages: 29

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

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

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

3rd Edition | April 1999 | Product Number: G06F23 | Price: $109.00

**Spec 6FA**
Specification for Fire Test for Valves
(includes Errata 1 dated December 2006 and Errata 2 dated December 2008)

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. Pages: 7

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

**Spec 6FA**
Specification for Fire Test for Valves—Russian

Russian translation of Spec 6FA.

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

**Spec 6FB**
Specification for Fire Test for End Connections
(includes Errata/Supplement dated December 2008)

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 and outlet connections (6B, 6BX, and segmented),
- API threaded and outlet connections, and
- other end connections (OECs). Pages: 20

3rd Edition | May 1998 | Effective Date: November 30, 1998
Reaffirmed: September 2011 | 2-Year Extension: July 2016
Product Number: G06FB3 | Price: $109.00

**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.

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

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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 not 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 heat treatment response of large cross section components, thereby ensuring that the component has the required mechanical properties at the depth below the surface established by the manufacturer at all critical locations. The recommend practice described herein suggests the requirements for batch-type bath quench and water spray quench-type heat treating practices. Pages: 9

Bull 6J
Bulletin on Testing of Oilfield Elastomers—A Tutorial

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 also contains a review of testing criteria, environments, evaluation procedures, guidelines for comparisons, and effects of other considerations on the evaluation of elastomeric seal materials and members. Pages: 15

TR 6J1
Elastomer Life Estimation Testing Procedures

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

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 °F. A total of 11 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, 350, 400, and 450 °F are reported. As a result of testing, yield strength reduction ratios at 300 °F to 450 °F 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

This publication is a new entry in this catalog. * This publication is related to an API licensing, certification, or accreditation program.
Std 7CW
Casing Wear Tests
Provides a method by which results will be reproducible, under a specified set of conditions, for conducting tests that determine casing wear due to rotation of drill stem elements.
This standard is intended to be used in a laboratory environment and is not intended for use in the field during operations. The testing requirements in this standard are not represented at well conditions. This standard is divided into four major areas: machine apparatus, procedures, materials, and reporting.
This standard will not address the significance of specific data values. It is the responsibility of the user of this standard to establish the appropriate test data values that are acceptable based on their respective application, operational limitations, and safety practices. Pages: 18
1st Edition | June 2015 | Product Number: G7CW01 | Price: $85.00

Spec 7F ♦
Oil Field Chain and Sprockets
(includes Errata 1 dated May 2013)
Covers the manufacture of the components for, and the assembly and packaging of, single and multiple strand, numbers 40 through 240, standard and heavy series roller chains for oil field applications, including chain designation, chain length tolerance, tensile strength specifications, pin and bushing press-out specifications, and dynamic test requirements. For informational purposes, Annex A provides recommendations for installation, lubrication, and maintenance of oil field chain drives, and Annex B includes a basic description of roller chain sprockets. Pages: 29
8th Edition | November 2010 | Effective Date: May 1, 2011
Reaffirmed: April 2016 | Product Number: G7F008 | Price: $116.00

Spec 7F *
Oil Field Chain and Sprockets—Chinese
Chinese translation of Spec 7F.
8th Edition | November 2010 | Product Number: G7F008C | Price: $82.00

RP 7G
Recommended Practice for Drill Stem Design and Operating Limits
(includes Errata 1 dated May 2000, Addendum 1 dated November 2003, and Addendum 2 dated August 2009)
Covers recommendations for the design and selection of drill string members and includes considerations of hole angle control, drilling fluids, weight, and rotary speed. Tables and graphs are included that present dimensional, mechanical, and performance properties of new and used drill pipe; new tool joints used with new and used drill pipe; drill collars; and halyes. Recommended standards for inspection of used drill pipe, used tubing work strings, and used tool joints are included. Pages: 154
16th Edition | August 1998 | Effective Date: December 1, 1998
Reaffirmed: May 2015 | 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

RP 7G *
Recommended Practice for Drill Stem Design and Operating Limits—Russian
Russian translation of RP 7G.
16th Edition | September 2009
Product Number: G07G6AR | Price: $155.00

Recommended Practice for Inspection and Classification of 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 RP 7G-2 is the identical national adoption of ISO 10407-2:2008. Pages: 213
Product Number: GX7G201 | Price: $140.00

RP 7G-2/ISO 10407-2:2008 *
Recommended Practice for Inspection and Classification of Drill Stem Element Inspection—Spanish
Spanish translation of RP 7G-2.
1st Edition | August 2009 | Product Number: GX7G201SP | Price: $140.00

RP 7HU1
Safe Use of 2-Inch Hammer Unions for Oilfield Applications
(includes Errata 1 dated February 2014)
Sets forth procedural recommendations as well as an engineering solution to the mismatching of a female 2-in. Figure 402, a female 2-in. Figure 602, or a female 2-in. Figure 1002 hammer union component (sub) with a male 2-in. Figure 1502 hammer union component (wing nut) as described in 3.2. The procedural recommendations described in this recommended practice should be implemented to reduce further incidents. The engineering solution, which makes impossible the mating of female 2-in. Figure 402, 2-in. Figure 602, and/or 2-in. Figure 1002 subs with the wing nut of the 2-in. Figure 1502 hammer union, applies to the manufacture of new hammer union components and should not be applied in the modification of existing hammer union components due to unknown factors caused by field wear. Pages: 12
Product Number: H7HU11 | Price: $37.00

Spec 7K ♦
Drilling and Well Servicing Equipment
(includes Errata 1 dated May 2016 and Errata 2 dated August 2016)
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;
- high-pressure mud and cement hoses;
- piston mud-pump components;
- drawworks components;
- manual tongs;
- safety clamps not used as hoisting devices;
- blowout preventer (BOP) handling systems;
- pressure-relieving devices for high-pressure drilling fluid circulating systems;
- snub-lines for manual and power tongs;
- rotary slips, both manual and powered;
- slip bowls; and
- spiders, both manual and powered. Pages: 130

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HOISTING TOOLS

RP 7L
Procedures for 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 hoes;
- slush pump connectors;
- drawworks components;
- spiders not used as elevators; manual tongs; and
- safety clamps not used as hoisting devices. Pages: 26
1st Edition | March 1995 | Effective Date: April 1, 1996
Reaffirmed: August 2012 | 2-Year Extension: October 2014
Product Number: G7L01 | Price: $109.00

Spec 7NRV*
Specification for Drill String Non-Return Valves
Provides the minimum acceptable requirements for drill string non-return valve (NRV) equipment. It covers drill string non-return valves, non-return valve subs, non-return valve landing nipples, non-return valve equalizing heads, and all components that establish tolerances and/or clearances that may affect performance or interchangeability of the NRV equipment. Non-return valve subs, non-return valve landing nipples, non-return valve equalizing heads, and NRVs manufactured by different facilities or manufacturers may be supplied as separate items. Pages: 19
Product Number: G7NRVO1 | Price: $70.00

Spec 7NRV
Specification for Drill String Non-Return Valves—Chinese
Chinese translation of Spec 7NRV.
1st Edition | June 2006 | Product Number: G7NRV01C | Price: $49.00

WIRE ROPE

RP 8B
Recommended Practice for Procedures for Inspection, Maintenance, Repair, and Remanufacture of Hoisting Equipment
Provides guidelines and establishes requirements for inspection, maintenance, repair, and remanufacture of items of hoisting equipment manufactured according to Spec 8A, Spec 8C, or ISO 13535 used in drilling and production operations, in order to maintain the serviceability of this equipment. Items of drilling and production hoisting equipment covered are:
- crown-block sheaves and bearings;
- traveling blocks and hook blocks;
- block-to-hook adapters;
- connectors and link adapters;
- drilling hooks;
- tubing hooks and sucker-rod hooks;
- elevator links;
- casing elevators, tubing elevators, drill-pipe elevators, and drill-collar elevators;
- sucker-rod elevators;
- 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 | 2-Year Extension: April 2014
Product Number: G7L01 | Price: $109.00

8th Edition | April 2012 | Product Number: G08B08 | Price: $95.00

Spec 8C*
Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)
(includes Errata dated May 2014)
Provides requirements for the design, manufacture, and testing of hoisting equipment suitable for use in drilling and production operations. This specification is applicable to numerous drilling and production hoisting equipment, some of which include: hoisting sheaves, traveling and hook blocks; elevator links, casing elevators, sucker rod elevators, rotary and power swivels, drilling hooks, wireline anchors, drill string motion compensators, and safety clamps. Pages: 53
5th Edition | April 2012 | Effective Date: October 1, 2012
Product Number: GX08C05 | Price: $140.00

Spec 8C
Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)—Chinese
Chinese translation of Spec 8C.
5th Edition | April 2012 | Product Number: GX08C05C | Price: $98.00

Spec 9A*
Specification for Wire Rope
(includes Errata 1 dated October 2012 and Addendum 1 dated November 2016)
Specifies the minimum requirements and terms of acceptance for the manufacture and testing of steel wire ropes not exceeding rope grade 2160 for the petroleum and natural gas industries. The following products are covered by this specification:
- wire rope,
- bright- or drawn-galvanized wire rope,
- well-measuring wire, and
- well-measuring strand.
Typical applications include tubing lines, rod hanger lines, sand lines, cable-tool drilling and clean out lines, cable tool casing lines, rotary drilling lines, winch lines, horse head pumping unit lines, torpedo lines, mast raising lines, guideline tensioner lines, riser tensioner lines, and mooring and anchor lines. Ropes for lifting slings and cranes, and wire for well-measuring and stand for well-servicing, are also included. The minimum breaking forces for the more common sizes, grades, and constructions of stranded rope are given in tables. However, this standard does not restrict itself to the classes covered

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by those tables. Other types, such as ropes with compacted strands and compacted (swaged) ropes, may also conform with its requirements. The minimum breaking force values for these ropes are provided by the manufacturer. For information only, other tables present the minimum breaking forces for large diameter stranded and spiral ropes (i.e. spiral strand and locked coil), while approximate nominal length masses for the more common stranded rope constructions and large diameter stranded and spiral ropes are also given. Pages: 57

26th Edition | May 2011 | Effective Date: November 1, 2011
Reaffirmed: April 2016 | Product Number: G9A026 | Price: $109.00

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 Ropes for Oil Field Service
Covers typical wire rope applications for the oil and gas industry. Typical practices in the application of wire rope to oil field service are indicated in Table 1, which shows the sizes and constructions commonly used. Because of the variety of equipment designs, the selection of other constructions than those shown is justifiable.

In oilfield service, wire rope is often referred to as wire line or cable. For the purpose of clarity, these various expressions are incorporated in this recommended practice. Pages: 44

14th Edition | October 2015 | Product Number: G9B014 | Price: $120.00

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. This specification is 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. This specification is 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 Spec 10A is the identical national adoption of ISO 10426-1:2009 (includes ISO errata). Pages: 38

Product Number: GX10A24 | Price: $145.00

RP 10B-2
Recommended Practice for Testing Well Cements
(includes Errata 1 dated June 2006 and Errata 2 dated January 2007) (supersedes RP 10B)

Specifies methods and gives recommendations for the testing of cement slurries and related materials under simulated well conditions. Pages: 111

2nd Edition | April 2013 | Product Number: G10B202 | Price: $220.00

RP 10B-3
Testing of Well Cements Used in Deepwater Well Construction
Provides procedures for testing well cement slurries and cement blends for use in a deepwater environment or wells drilled in areas with a low seafloor temperature or areas where low well temperatures exist. For the purposes of this document the term “deepwater” includes areas where low seafloor temperatures exist, independent of water depth. The procedures contained in this document serve as guidance for the testing of well cement slurries used in deepwater well construction. Additionally, testing methods contained in this document (most notably at mudline conditions) may also be used in those circumstances where low seafloor temperatures are found at shallow water depths. These conditions are found in areas including the North Sea, Norwegian Sea, Barents Sea, Kara Sea, Beaufort Sea, Chukchi Sea, Caspian Sea, and Black Sea.

The test methods contained in this recommended practice, though generally based on API 10B-2, take into account the specialized testing requirements and unique wellbore temperature profiles found in deepwater wells or wells in areas with low seafloor temperatures. This document does not address the mitigation of shallow water flow zones in deeper wells, which is addressed in RP 65. Pages: 32

2nd Edition | January 2016 | Product Number: G10B32 | Price: $95.00

RP 10B-4
Preparation and Testing of Foamed Cement Formulations at Atmospheric Pressure
Defines the test methods including the generation of unfoamed base and their corresponding foamed cement slurries at atmospheric pressure. These procedures are developed for foaming cement slurries with air, at atmospheric conditions, which could mimic a foam quality experienced with nitrogen at downhole conditions; they may be modified to accommodate other gases such as nitrogen. Slurries that are foamed with nitrogen, and their properties, will also be discussed within this standard as they are relevant to the scope of the standard.

This standard does not address testing at pressures above atmospheric conditions nor does this standard include or consider the effects of nitrogen solubility in the nitrogen fraction calculations. Pages: 40

2nd Edition | October 2015 | Product Number: G10B402 | Price: $95.00

RP 10B-5/ISO 10426-5:2004
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.

This edition of RP 10B-5 is the identical national adoption of ISO 10426-5:2004. Pages: 13

Product Number: GX10B501 | Price: $80.00

RP 10B-6/ISO 10426-6:2008
Recommended Practice on Determining the Static Gel Strength of Cement Formulations
This document specifies requirements and provides test methods for the determination of static gel strength (SGS) of the cement slurries and related materials under simulated well conditions.

This edition of RP 10B-6 is the modified national adoption of ISO 10426-6:2008. Pages: 7

1st Edition | August 2010 | Reaffirmed: April 2015
Product Number: G610B601 | Price: $62.00

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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.
**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. The procedures provide verification testing for the manufacturer's design, materials, and process specifications and periodic testing to confirm the consistency of product performance. Spec 10D is not applicable to rigid or positive centralizers.

This edition of Spec 10D is the identical national adoption of ISO 10427-1:2001. Pages: 12

6th Edition | March 2002 | Effective Date: September 1, 2002
Reaffirmed: April 2015 | Product Number: GX10D06 | Price: $89.00

**Spec 10D/ISO 10427-1:2001**

**Specification for Bow-Spring Casing Centralizers—Chinese**

Chinese translation of Spec 10D.


**RP 100-2/ISO 10427-2:2004**

**Recommended Practice for Centralizer Placement and Stop Collar Testing**

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

This edition of RP 100-2 is the identical national adoption of ISO 10427-2:2004. Pages: 14

Product Number: GG100D21 | Price: $77.00

**RP 10F/ISO 10427-3:2003**

**Recommended Practice for Performance Testing of Cementing Float Equipment**

(includes Errata 1 dated September 2003)

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

This edition of RP 10F is the identical national adoption of ISO 10427:2003. Pages: 12

Product Number: GX10F03 | Price: $64.00

**TR 10TR1**

**Cement Sheath Evaluation**

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

2nd Edition | September 2008
Product Number: G10TR12 | Price: $145.00

**TR 10TR1**

**Cement Sheath Evaluation—Kazakh**

Kazakh translation of TR 10TR1.

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

**TR 10TR2**

**Shrinkage and Expansion in Oilwell Cements**

Allows the measurement of the volumetric changes in oilwell cements in the wellbore as well as a series of test methods and procedures developed to measure these phenomena. Pages: 57

Product Number: G10TR2 | Price: $122.00

**TR 10TR2**

**Shrinkage and Expansion in Oilwell Cements—Russian**

Russian translation of TR 10TR2.

1st Edition | July 1997 | Product Number: G10TR2R | Price: $97.00

**TR 10TR3**

**Technical Report on Temperatures for API Cement Operating Thickening Time Tests**

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

1st Edition | May 1999 | Reaffirmed: May 2005
Product Number: G10TR3 | Price: $157.00

**TR 10TR3**

**Technical Report on Temperatures for API Cement Operating Thickening Time Tests—Russian**

Russian translation of TR 10TR3.

1st Edition | May 1999 | Product Number: G10TR3R | Price: $125.00

**TR 10TR4**

**Selection of Centralizers for Primary Cementing Operations**

Provides the petroleum industry with information for three types of centralizers, their selection and application, and their advantages and limitations. Pages: 23

1st Edition | May 2008 | Product Number: G10TR40 | Price: $61.00

**TR 10TR4**

**Selection of Centralizers for Primary Cementing Operations—Kazakh**

Kazakh translation of TR 10TR4.

1st Edition | May 2008 | Product Number: G10TR40K | Price: $49.00

**TR 10TR4**

**Selection of Centralizers for Primary Cementing Operations—Russian**

Russian translation of TR 10TR4.

1st Edition | May 2008 | Product Number: G10TR40R | Price: $48.00

**TR 10TR5**

**Methods for Testing of Solid and Rigid Centralizers**

Provides the industry with methods for testing rigid and solid centralizers. Pages: 16

1st Edition | May 2008 | Product Number: G10TR50 | Price: $61.00

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or control flows just prior to, during, and after primary cementing operations. 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. The second objective is to help prevent sustained casing pressure (SCP). 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

Product Number: G65202 | Price: $130.00
You may download a PDF of this document from the Policy & Issues/Hydraulic Fracturing section of the API website.

**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 Pump Assemblies, Components, and Fittings
Provides the requirements and guidelines for the design of subsurface sucker rod pumps and their components as defined herein for use in the sucker rod lift method for the petroleum and natural gas industry. The specification covers subsurface sucker rod pump assemblies (including insert and tubing), components, and fittings in commonly used bore sizes for the sucker rod lift method. Sufficient dimensional and material requirements are provided to assure interchangeability and standardization of all component parts. The specification does not cover specialty subsurface sucker rod pump accessories or special design components. Also, installation, operation, and maintenance of these products are not included in this specification; however, recommendations can be found in RP 11AR. Pages: 107
Product Number: G11AX13 | Price: $175.00

**Spec 11B**
Specification for Sucker Rods, Polished Rods and Liners, Couplings, Sinker Bars, Polished Rod Clamps, Stuffing Boxes, and Pumping Tees
(includes Errata 1 dated October 2010 and Errata 2 dated February 2011)
Provides the requirements and guidelines for the design and rating of steel sucker rods and por rod, polished rods, polished rod liners, couplings and sub-couplings, fiber reinforced plastic (FRP) 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. Annexes A through H provide the requirements for specific products. Annex I includes the requirements for thread gauges, Annex J 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
2-Year Extension: February 2015
Product Number: G11B27 | Price: $155.00
Exploration and Production

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TR 11L6
Technical Report on Electric Motor Prime Mover for Beam Pumping Unit Service
Covers polyphase, squirrel-cage, induction motors for use as the prime mover for beam pumping units (size range of 200 hp and below). Motors to be operated from solid-state or other types of variable frequency/variable voltage power supplies for adjustable speed applications will require individual consideration to provide satisfactory performance and are beyond the scope of this document. Motors conforming to this document are suitable for operation in accordance with their full load rating under ambient temperature at a maximum altitude of 1000 m (3300 ft) above sea level with outdoor sever duty application, including blowing dust or snow, corrosive atmospheres, high humidity, and cyclic loading. Pages: 13
2nd Edition | May 2008 | Product Number: G11L602 | Price: $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

RP 11S2
Recommended Practice for Electric Submersible Pump Testing
Provides guidelines and procedures covering electric submersible pump performance testing intended to establish product consistency. These practices are generally considered appropriate for the majority of pump applications. This document covers the acceptance testing of electric submersible pumps (sold as new) by manufacturers, vendors, or users to the prescribed minimum specifications. Pages: 12
2nd Edition | August 1997 | Effective Date: October 1, 1997
Reaffirmed: October 2013 | Product Number: G11S22 | Price: $83.00

RP 11S2 *
Recommended Practice for Electric Submersible Pump Testing—Russian
Russian translation of RP 11S2.
2nd Edition | August 1997 | Product Number: G11S22R | Price: $67.00

RP 11S3
Recommended Practice for Electrical Submersible Pump Installations
Addresses the installation and replacement of all major components comprising an electrical submersible pumping system. Specifically, it addresses equipment installation on tubing in oil and gas production operations. Pages: 11
Product Number: G11S32 | Price: $89.00

RP 11S3 *
Recommended Practice for Electrical Submersible Pump Installations—Russian
Russian translation of RP 11S3.

RP 11S4
Recommended Practice for Sizing and Selection of Electric Submersible Pump Installations
Discusses in some detail each component of the ESP system (pump, motor, intake, seal or protector, cable, switchboard, etc.) as far as what must be considered for the best selection at a desired rate and well conditions. Examples are given to illustrate the basic design procedure and illustrate how PVT correlations, multiphase flow correlations, and inflow performance relationships are used. Summary designs and computer examples using the detailed design principles are presented that show how design considerations fit together and how tools such as computer programs allow faster solutions resulting in easier trial and error calculations for optimization of designs and study of existing installations. Topics such as PVT correlations, multiphase flow correlations, and inflow performance relationships are discussed in the appendices. Pages: 31
Product Number: G11S43 | Price: $79.00

RP 11S5
Recommended Practice for the Application of Electrical Submersible Cable Systems
Covers the application (size and configuration) of electrical submersible cable systems by manufacturers, vendors, or users. The document addresses the varies uses of different cable insulation systems, including jackets, braids, armor, and related coverings, as well as auxiliary cable components for cable conductors. The document also addresses splicing and terminating cables including splicing, lengthening, and repairs. Pages: 38
Product Number: G11S52 | Price: $109.00

RP 11S6
Recommended Practice for Testing of Electric Submersible Pump Cable Systems
Covers field testing of electric submersible pump cable systems. This document is organized into three major topic categories. The first category provides general definitions and an overview of terms, safety considerations, and cable system preparation guidelines. The second category identifies various situations under which testing is performed. The third category identifies test methods and procedures. Pages: 18
Product Number: G11S61 | Price: $89.00

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**RP 11S7**
Recommended Practice on Application and Testing of Electric Submersible Pump Seal Chamber Sections
Applies to the seal chamber section used in support of an electric submersible motor. The recommended practice contains tutorial, testing, and failure evaluation information on the seal chamber section used in support of an electric submersible motor. The document provides a general understanding of construction and functioning of seal chamber sections, identification of well conditions, system requirements, and characteristics that influence component section and application. Pages: 28
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 RP 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 in various standard sizes and capacities for internal pressures approximately atmospheric. This specification is designed to provide the oil production industry with safe and economical bolted tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. This specification is for the convenience of purchasers and manufacturers in ordering and fabricating tanks. Pages: 31
16th Edition | November 2014
Product Number: G12B156 | Price: $120.00

**Spec 12D**
Specification for Field Welded Tanks for Storage of Production Liquids
Covers material, design, fabrication, and testing requirements for vertical, cylindrical, aboveground, closed top, welded steel storage tanks with internal pressures approximately atmospheric at various sizes and capacities ranging from 900 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
2-Year Extension: November 2015
Product Number: G12D11 | Price: $97.00

**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
2-Year Extension: November 2015
Product Number: G12F12 | Price: $97.00

**Spec 12F**
Specification for Shop Welded Tanks for Storage of Production Liquids—Chinese
Chinese translation of Spec 12F.
12th Edition | October 2008 | Product Number: G12F12C | Price: $68.00

**Spec 12J**
Specification for Oil and Gas Separators
Covers minimum requirements for the design, fabrication, and plant testing of oil and gas separators and oil-gas-water separators that are used in the production of oil and gas and are located at some point on the producing flow line between the wellhead and pipeline. Separators covered by this specification may be vertical, spherical, or single or double barrel horizontal. Unless otherwise agreed upon between the purchaser and the manufacturer, the jurisdiction of this specification terminates with the pressure vessel as 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: April 1, 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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**This publication is a new entry in this catalog.**

**This publication is related to an API licensing, certification, or accreditation program.**
Specification for Indirect Type Oilfield Heaters

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

8th Edition | October 2008 | Effective Date: April 1, 2009
Product Number: G12K08 | 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 separator or sometimes as a heater treating. High gas-oil ratio wells or those produced by gas lift may require the installation of an oil and gas separator upstream of the separator to remove most of the associated gas before the emulsion enters the separator. The water to oil ratio is high, free water knockouts may be required upstream of the separator. The jurisdiction of this specification terminates with each pressure vessel as applicable: the emulsion separator 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 separator is a pressure vessel used in the oil producing industry for separating oil-water emulsions and gas and for breaking or resolving emulsified well streams into water and saleable clean oil components. Emulsion separators 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: April 1, 2009
Product Number: G12L05 | Price: $97.00

RP 12N

Recommended Practice for the Operation, Maintenance and Testing of Firebox Flame Arrestors

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

Product Number: G12N02 | Price: $83.00

Spec 12P ◆

Specification for Fiberglass Reinforced Plastic Tanks

Covers material, design, fabrication, and testing requirements for fiberglass reinforced plastic (FRP) tanks. Only shop-fabricated, vertical, cylindrical tanks are covered. Tanks covered by this specification are intended for aboveground and atmospheric pressure service. This specification applies to new tanks. The requirements may be applied to existing tanks at the discretion of the owner/operator.

This specification is designed to provide the petroleum industry with various standard sizes of FRP tanks. Because of the versatility of FRP tanks, the user shall be responsible for determining the suitability of FRP tanks for the intended service.

Unsupported cone bottom tanks are outside the scope of this specification. Pages: 27

4th Edition | February 2016 | Effective Date: August 1, 2016
Product Number: G12P04 | Price: $108.00

RP 12R1

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

For use as a guide for new tank installations and maintenance of existing tanks, Spec. 12R1 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 Specs 12F, 12D, 12F, and 12P when employed in on-land production service, but its basic principles are applicable to atmospheric tanks of other dimensions and specifications when they are employed in similar oil and gas production, treating, and processing services. It is not applicable to refineries, petrochemical plants, marketing bulk stations, or pipeline storage facilities operated by carriers. Pages: 49

2-Year Extension: November 2015 | Product Number: G12R15
Price: $132.00

DRILLING FLUID MATERIALS

Spec 13A/ISO 13500:2009 ◆

Specification for Drilling Fluid Materials

(includes Errata 1 dated August 2014, Errata 2 dated May 2015, Errata 3 dated July 2015, and Errata 4 dated October 2016)

Covers physical properties and test procedures for materials manufactured for use in oil- and gas-well drilling fluids. The materials covered are barite, haematite, bentonite, nontreated bentonite, OCMA-grade bentonite, attapulgite, sepiolite, technical-grade low-viscosity carboxymethylcellulose (CMC-LVT), technical-grade high-viscosity carboxymethylcellulose (CMC-HVT), starch, low-viscosity polyacrylamide cellulose (PA-C-LV), high-viscosity polyacrylamide cellulose (PA-C-HVT), drilling-grade Xanthan gum, and barite 4.1. This International Standard is intended for the use of manufacturers of named products.

This edition of Spec 13A is the identical national adoption of ISO 13500:2009. Pages: 109

Effective Date: August 1, 2010
Product Number: G13A018 | 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: G13A018C | Price: $127.00

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RP 13B-1/ISO 10414-1:2008
Recommended Practice for Field Testing Water-Based Drilling Fluids (includes Errata 1 dated August 2014)
Provides standard procedures for determining the following characteristics of water-based drilling fluids:
- drilling fluid density (mud weight);
- viscosity and gel strength;
- filtration;
- water, oil, and solids contents;
- sand content;
- methylene blue capacity;
- pH;
- alkalinity and lime content;
- chloride content;
- total hardness as calcium.
Annexes A through K provide additional test methods.
This edition of API 13B-1 is the identical national adoption of ISO 10414-1:2008. Pages: 91
Product Number: GX13B14 | Price: $165.00

RP 13B-2
Recommended Practice for Field Testing Oil-Based Drilling Fluids (includes Errata 1 dated August 2014)
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 concentrations;
- alkalinity, chloride concentration, and calcium concentration;
- electrical stability;
- lime and calcium concentrations, calcium chloride, and sodium chloride concentrations;
- low-gravity solids and weighting material concentrations.
The annexes provide additional test methods or examples that can optionally be used for the determination of:
- shear strength (Annex A);
- oil and water concentrations from cuttings (Annex B);
- drilling fluid activity (Annex C);
- aniline point (Annex D);
- lime, salinity, and solids concentration (Annex E);
- sampling, inspection, and rejection (Annex F);
- rig-site sampling (Annex G);
- cuttings activity (Annex H);
- active sulfide (Annex I);
- calibration and verification of glassware, thermometers, viscometers, retort kit cups, and drilling fluid balances (Annex J);
- high-temperature/high-pressure filtration using the permeability-plugging apparatus (PPA) (Annex K);
- elastomer compatibility (Annex L);
- sand content of oil-based fluid (Annex M);
- identification and monitoring of weight-material sag (Annex N);
- oil-based drilling fluid test report form (Annex O). Pages: 141
5th Edition | April 2014 | Product Number: G13B205 | Price: $205.00

RP 13C
Recommended Practice on Drilling Fluid Processing Systems Evaluation
Specifies a standard procedure for assessing and modifying the performance of solids control equipment systems commonly used in the field in petroleum and natural gas drilling fluids processing. The procedure described in this standard is not intended for the comparison of similar types of individual pieces of equipment. Pages: 60
5th Edition | October 2014 | Product Number: G13C05 | Price: $135.00

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 RP, 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: 79
Product Number: G13D06 | Price: $134.00

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

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

RP 13I/ISO 10416:2008
Recommended Practice for Laboratory Testing of Drilling Fluids
Provides procedures for the laboratory testing of the physical, chemical, and performance properties of both drilling fluid materials and drilling fluid. It is applicable to both water- 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 RP 13I is the identical national adoption of ISO 10416:2008. Pages: 108
Product Number: GX13I8 | Price: $186.00

RP 13J
Testing of Heavy Brines
Covers the physical properties, potential contaminants, and test procedures for heavy brine fluids manufactured for use in oil and gas well drilling, completion, fracturing, and workover fluids. RP 13J 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, the clarity or amount of particulate matter carried in the brines, the crystallization point or the temperature (both ambient and under pressure) at which the brines make the transition between liquid and solid, the pH, and iron contamination. It also contains a discussion of gas hydrate formation and mitigation, brine viscosity, corrosion testing, buffering capacity, and a standardized reporting form. RP 13J is intended for the use of manufacturers, service companies, and end users of heavy brines. Pages: 76
5th Edition | October 2014 | Product Number: G13J05 | Price: $130.00

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

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

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

3rd Edition | May 2011 | Product Number: G13K03R | Price: $86.00

RP 13L
Recommended Practice for Training and Qualification of Drilling Fluid Technologists

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

1st Edition | February 2003 | Reaffirmed: October 2010
2-Year Extension: June 2015 | 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 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 RP 13M is the identical national adoption of ISO 13503-1:2003. Pages: 21

1st Edition | July 2004 | Reaffirmed: October 2010
2-Year Extension: June 2015 | Product Number: G13M01 | 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 RP 13M-4 is the identical national adoption of ISO 13503-4:2006. Pages: 14

Product Number: G13M41 | Price: $57.00

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RP 14E *
Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems—Chinese
Chinese translation of RP 14E.
5th Edition | October 1991
Product Number: 811-07185 CN940 | Price: $105.00

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

Recommended 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 14FZ. These facilities include drilling, producing, and pipeline transportation facilities associated with oil and gas exploration and production. This recommended practice (RP) is not applicable to Mobile Offshore Drilling Units (MODUs) without production facilities. This document is intended to bring together in one place a brief description of basic desirable electrical practices for offshore electrical systems. The recommended practices contained herein recognize that special electrical considerations exist for offshore petroleum facilities. Pages: 150
Product Number: G14F05 | Price: $119.00

RP 14FZ
Recommended Practice for Design, Installation, and Maintenance of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Zone 0, Zone 1, and Zone 2 Locations

Recommended 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 Division 1 or Division 2, reference RP 14F. These facilities include drilling, producing, and pipeline transportation facilities associated with oil and gas exploration and production. This recommended practice (RP) is not applicable to Mobile Offshore Drilling Units (MODUs) without production facilities. This document is intended to bring together in one place a brief description of basic desirable electrical practices for offshore electrical systems. The recommended practices contained herein recognize that special electrical considerations exist for offshore petroleum facilities. These include:

- inherent electrical shock possibility presented by the marine environment and steel decks;
- space limitations that require that equipment be installed in or near hazardous (classified) locations;
- corrosive marine environment;
- motion and buoyancy concerns associated with floating facilities.

Pages: 177
2nd Edition | May 2013 | Product Number: G14F20 | Price: $280.00

RP 14G
Recommended Practice for Fire Prevention and Control on Fixed 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 firefighting, 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
Product Number: G14G04 | Price: $124.00

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

Provides useful procedures and guidelines for planning, designing, and arranging offshore production facilities and performing a hazards analysis on open-type offshore production facilities. Discusses several procedures that can be used to perform a hazards analysis, and presents minimum requirements for process safety information and hazards analysis that can be used for satisfying RP 75. Pages: 75
Product Number: G14J02 | Price: $117.00

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 Spec 14L is the identical national adoption of ISO 16070:2005. Pages: 25
Product Number: GG14L02 | Price: $119.00

Spec 14L/ISO 16070:2005 *
Specification for Lock Mandrels and Landing Nipples—Chinese

Chinese translation of Spec 14L.
2nd Edition | July 2007 | Product Number: GX14L02C | Price: $84.00

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

Worldwide, marine exploration, production, development, and decommissioning operations are conducted from a variety of structures. These installments must be inspected periodically and maintained in order to assure structural integrity and minimize pollution risks. Maintenance of an offshore structure, regardless of its classification, necessarily includes blasting and coating activities. The purpose of this publication is to establish practices and procedures that should be followed to minimize the discharge of spent blast abrasive, and paint overspray to the surrounding waters during these activities. Pages: 16
1st Edition | June 2007 | Product Number: G09101 | Price: $61.00

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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 RP also apply to line pipe applications. Composite lined tubing typically consists of a fiber reinforced polymer liner within the steel host, providing protection of that steel host from corrosive attack. Both API and premium connections can be employed, typically using corrosion barrier rings to maintain corrosion resistance between ends of adjacent liners. This document contains recommendations on material selection, product qualification, and definition of safety and design factors. Quality control tests, minimum performance requirements are included. The RP applies to composite lined carbon steel for systems up to 10 in. (250 mm) diameter, operating at pressures up to 10,000 psi (69 MPa) and maximum temperatures of 300 °F (150 °C). The principles outlined 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 Errata 1 dated August 2016)
Formulated to provide the availability of safe, dimensionally, and functionally inter-changeable high-pressure fiberglass line pipe with a pressure rating from 500 lbf/in.² to 5000 lbf/in.² (3.45 MPa to 34.5 MPa), inclusive, in 250 lbf/in.² (1.72 MPa) increments for pipes ≤ than NPS 12 in. and 100 lbf/in.² (0.69 MPa) increments for pipes > than NPS 12 in. This specification is limited to mechanical connections and the technical content provides requirements for performance, design, materials, tests and inspection, marking, handling, storing, and shipping. Critical components are items of equipment having requirements specified in this document. This specification is applicable to rigid pipe components made from thermosetting resins and reinforced with glass fibers. Typical thermosetting resins are epoxy, polyester, vinyl ester, and phenolic. Thermoplastic resins are excluded from the scope of this specification. Any internal liners applied shall be made also from thermosetting resins. Fiberglass line pipe for use in low-pressure systems are covered in Spec 15LR. This specification covers fiberglass pipe utilized for the production of oil and gas. Specific equipment covered by this specification is high-pressure line pipe and fittings, flanges, reducers, and adapters. Pages: 42

4th Edition | February 2016 | Effective Date: August 1, 2016
Product Number: G15HR4 | Price: $110.00

Spec 15LE
Specification for Polyethylene Line Pipe (PE)
Provides standards for polyethylene (PE) line pipe suitable for use in conveying oil, gas, and non-potable water in underground, aboveground, 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


Spec 15LE
Specification for Polyethylene Line Pipe (PE)—Chinese
Chinese translation of Spec 15LE.

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

This edition of RP 16A is the modified national adoption of ISO 13533:2001. Pages: 109

3rd Edition | June 2004 | Effective Date: December 1, 2004
Reaffirmed: August 2010 and August 2016
Product Number: GX16A03 | Price: $165.00

Spec 16A/ISO 13533:2001 *
Specification for Drill-Through Equipment—Chinese
Chinese translation of Spec 16A.
3rd Edition | June 2004 | Product Number: GX16A03C | Price: $116.00

Spec 16C ◆
Choke and Kill Equipment
(includes Errata 1 dated July 2015, Errata 2 dated November 2015, Errata 3 dated February 2016, and Addendum 1 and Errata 4 dated July 2016)
Establishes the minimum requirements for the design and manufacture of following types of new equipment:
• articulated choke and kill lines;
• choke and kill manifold buffer chamber;
• choke and kill manifold assembly;
• drilling choke actuators;
• drilling choke controls;
• drilling chokes;
• flexible choke and kill lines;
• union connections used in choke and kill assemblies;
• rigid choke and kill lines;
• swivel unions used in choke and kill equipment.
These requirements were formulated to provide for safe and functionally interchangeable surface and subsea choke and kill system equipment utilized for drilling oil and gas wells.
Technical content provides the minimum requirements for performance, design, materials, welding, testing, inspection, storing, and shipping.
Pages: 114
2nd Edition | March 2015 | Product Number: G16C02 | Price: $150.00

Spec 16D *
Specification for Control Systems for Drilling Well Control Equipment
and Control Systems for Diverter Equipment—Chinese
Chinese translation of Spec 16D.
2nd Edition | July 2004 | Product Number: G16D02C | Price: $124.00

Spec 16D *
Specification for Control Systems for Drilling Well Control Equipment
and Control Systems for Diverter Equipment—Russian
Russian translation of Spec 16D.
2nd Edition | July 2004 | Product Number: G16D02K | Price: $142.00

Spec 16D *
Specification for Control Systems for Drilling Well Control Equipment
and Control Systems for Diverter Equipment—Kazakh
Kazakh translation of Spec 16D.
2nd Edition | July 2004 | Product Number: G16D02R | Price: $141.00

Spec 16F ◆
Specification for Marine Drilling Riser Equipment
(includes Addendum 1 dated September 2014)
Establishes standards of performance and quality for the design, manufacture, and fabrication of marine drilling riser equipment used in conjunction with a subsea blowout preventer (BOP) stack. This specification covers the following major subsystems in the marine drilling riser system:
• riser tensioner equipment;
• flex/ball joints;
• choke, kill, and auxiliary lines;
• drape hoses and jumper lines for flex/ball joints;
• telescopic joint (slip joint) and tensioner ring riser joints;
• buoyancy equipment;
• riser running equipment;
• special riser system components;
• lower riser adapter. Pages: 43
1st Edition | August 2004 | Effective Date: February 1, 2005
Reaffirmed: August 2010 | 2-Year Extension: June 2015
Product Number: G16F01 | Price: $119.00

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Specification for Marine Drilling Riser Couplings

- a surface flow head or surface test tree constructed to standards
- christmas trees constructed to standards stipulated in Spec 6A and/or
- coiled tubing drilling applications performed through:
  - equipment assembly and operation used in coiled tubing intervention and
  - addressed in this recommended practice. This document covers well control
  - control operations using fluids for hydrostatic pressure balance are not
  - it relates to well control practices. Industry practices for performing well
  - Addresses coiled tubing well control equipment assembly and operation as
  - connection of the lower flex/ball joint. It specifically excludes the diverter,
  - marine drilling riser system includes the tensioner system and all equipment

1st Edition | November 1997 | Reaffirmed: August 2010
2-Year Extension: June 2015 | Product Number: G07249 | Price: $109.00

Spec 16R *
Specification for Marine Drilling Riser Couplings (replaces 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.

1st Edition | January 1997 | Effective Date: June 1, 1997
Reaffirmed: August 2010 | 2-Year Extension: June 2015
Product Number: G16R01 | Price: $97.00

Spec 16R *
Specification for Marine Drilling Riser Couplings—Chinese (replaces RP 2R)

Chinese translation of Spec 16R.

1st Edition | January 1997 | Product Number: G16R01C | Price: $68.00

Spec 16RCD *
Specification for Rotating Control Devices

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

2nd Edition | September 2015 | Effective Date: March 10, 2016
Product Number: G16RCD02 | Price: $155.00

RP 16ST
Coiled Tubing Well Control Equipment Systems

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

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

Product Number: G16ST01 | Price: $145.00

Std 53
Blowout Prevention Equipment Systems for Drilling Wells (includes Addendum 1 dated July 2016)

Provides requirements on the installation and testing of blowout prevention equipment systems on land and marine drilling rigs (barge, platform, bottom-supported, and floating). Blowout preventer equipment systems are comprised of a combination of various components. The following components are required for operation under varying rig and well conditions:

- blowout preventers (BOPs);
- choke and kill lines;
- choke manifolds;
- control systems;
- auxiliary equipment.

The primary functions of these systems are to confine well fluids to the wellbore, provide means to add fluid to the wellbore, and allow controlled volumes to be withdrawn from the wellbore. Diverter and rotating head systems (rotating control devices) are not addressed in this standard (see RP 64 and Spec 16RCD, respectively); their primary purpose is to safely divert or direct flow rather than to confine fluids to the wellbore. Procedures and techniques for well control are not included in this standard.


Std 53 *
Blowout Prevention Equipment Systems for Drilling Wells—Kazakh
Kazakh translation of Std 53.


RP 59
Recommended Practice for Well Control Operations

Provides information that can serve as a voluntary industry guide for safe well control operations. This publication is designed to serve as a direct field aid in well control and as a technical source for teaching well control principles. This publication establishes recommended operations to retain pressure control of the well under pre-kick conditions and recommends practices to be utilized during a kick. It serves as a companion to RP 53 and RP 64.

Product Number: G59002 | Price: $122.00

RP 59 *
Recommended Practice for Well Control Operations—Kazakh
Kazakh translation of RP 59.

2nd Edition | May 2006 | Product Number: G59002K | Price: $98.00

RP 59 *
Recommended Practice for Well Control Operations—Russian
Russian translation of RP 59.

2nd Edition | May 2006 | Product Number: G59002R | Price: $97.00

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RP 64
Recommended Practice for Diverter Systems Equipment and Operations

Covers the selection, installation, testing, and operation of diverter equipment systems on land and marine drilling rigs (barge, platform, bottom-supported, and floating). Diverter systems are composed of all subsystems required to operate the diverter under varying rig and well conditions. A general description of operational procedures is presented with suggestions for the training of rig personnel in the proper use, care, and maintenance of diverter systems. Equipment installations, arrangements, and operations as set forth in this publication are deemed adequate to meet specified well conditions and intended uses. Examples presented in this document are simplified embodiments and are not intended to be limiting or absolute. Pages: 61

Product Number: G64002 | Price: $107.00

RP 64 *
Recommended Practice for Diverter Systems Equipment and Operations—Kazakh

Kazakh translation of RP 64.

2nd Edition | October 2001 | Product Number: G64002K | Price: $86.00

RP 64 *
Recommended Practice for Diverter Systems Equipment and Operations—Russian

Russian translation of RP 64.

2nd Edition | November 2001 | Product Number: G64002R | Price: $85.00

SUBSEA PRODUCTION SYSTEMS

RP 17A/ISO 13628-1:2005
Design and Operation of Subsea Production Systems—General Requirements and Recommendations
(includes Addendum 1 dated September 2015, Errata 1 dated September 2011, Errata 2 dated January 2012, Errata 3 dated June 2013, Errata 4 dated July 2013, Errata 5 dated October 2013, Errata 6 dated August 2015, and Errata 7 dated October 2015)

Provides guidelines for the design, installation, operation, repair, and decommissioning of subsea production systems. The elements of subsea production systems included are wellheads (both subsea and mudline casing suspension systems) and trees; pipelines and end connections; controls, control lines, and control fluids; templates and manifolds; and production riser (both rigid and flexible). Other sections cover operations, quality assurance, materials, and corrosion. This is intended as an umbrella document to govern other parts of the subsea document suite of standards dealing with more detailed requirements for the subsystems 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 transfer them to a given processing facility located offshore (fixed, floating, or subsea) or onshore, or to inject water/gas through subsea wells. Specialized equipment, such as split trees and trees and manifolds in atmospheric chambers, are not specifically discussed because of their limited use. However, the information presented is applicable to those types of equipment.

This edition of RP 17A is the identical national adoption of ISO 13628-2005. Pages: 232

2-Year Extension: June 2016 | Product Number: GX17A04 | Price: $182.00

RP 17B
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 (RP) supplements Specs 17J and 17K, which specify minimum requirements for the design, material selection, manufacture, testing, marking, and packaging of unbonded and bonded flexible pipe, respectively. This RP applies to flexible pipe assemblies, consisting of segments of flexible pipe body with end fittings attached to both ends. Both bonded and unbonded pipe types are covered. In addition, this RP applies to flexible pipe systems, including ancillary components. The applications covered by this RP are sweet- and sour-service production, including export and injection applications. This RP applies to both static and dynamic flexible pipe systems used as flowlines, risers, and jumpers. This RP does cover, in general terms, the use of flexible pipes for offshore loading systems. This RP does not cover flexible pipes for use in choke and kill lines or umbilical and control lines. Pages: 268

5th Edition | May 2014 | Product Number: G017B05 | Price: $230.00

Spec 17D/ISO 13628-4 *
Design and Operation of Subsea Production Systems—Subsea Wellhead and Tree Equipment
(includes Addendum 1 dated September 2015, Errata 1 dated September 2011, Errata 2 dated January 2012, Errata 3 dated June 2013, Errata 4 dated July 2013, Errata 5 dated October 2013, Errata 6 dated August 2015, and Errata 7 dated October 2015)

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, storing, 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.

This edition of Spec 17D is the identical national adoption of 13628-4. Pages: 254

2nd Edition | May 2011 | Effective Dates: February 1, 2013 [for Valve and Actuator Design Validation (Test Requirements) Only] and November 1, 2011 [for All Other Requirements]
2-Year Extension: July 2016 | Product Number: GX17D02 | Price: $186.00

Spec 17D/ISO 13628-4 *
Design and Operation of Subsea Production Systems—Subsea Wellhead and Tree Equipment—Chinese

Chinese translation of Spec 17D.

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

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.

This edition of Spec 17E is the identical national adoption of ISO 13628-5:2009. Pages: 167

Product Number: GX17ED4 | Price: $194.00

Spec 17F ♦  Standard for Subsea Production Control Systems

Applies 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 equipment is utilized for control of subsea production of oil and gas and for subsea water and gas injection services. Where applicable, this specification may be used for equipment on multiple-well applications. This document establishes design standards for systems, subsystems, components, and operating fluids in order to provide for the safe and functional control of subsea production equipment. It contains various types of information related to subsea production control systems that includes: informative data that provide an overview of the architecture and general functionality of control systems for the purpose of introduction and information; basic prescriptive data that shall be adhered to by all types of control system; selective prescriptive data that are control-system-type sensitive and shall be adhered to only when they are relevant; and optional data or requirements that need be adopted only when considered necessary either by the purchaser or the vendor. In view of the diverse nature of the data provided, control system purchasers and specifiers are advised to select from this document only the provisions needed for the application at hand. Rework and repair of used equipment are beyond the scope of this specification. Pages: 114

3rd Edition | May 2014 | Product Number: G017F03 | Price: $220.00

RP 17G/ISO 13628-7:2005

Recommended Practice for Completion/Workover Riser

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

This edition of RP 17G is the identical national adoption of ISO 13628-7:2005. Pages: 242

Product Number: GX17G02 | Price: $182.00

Spec 17K/ISO 13628-10:2005 ♦  Specification for Bonded Flexible Pipe

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 non-metallic 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. Pages: 90

4th Edition | May 2014 | Effective Date: November 1, 2014
Product Number: G017J04 | Price: $135.00

Spec 17M/ISO 13628-11:2009

Provides recommendations for development and design of remotely operated subsea tools and interfaces on subsea production systems in order to maximize the potential of standardizing equipment and design principles. This document does not cover manned intervention, internal wellbore intervention, internal flowline inspection, tree running, and tree running equipment. However, all the related subsea remotely operated vehicle/remotely operated tool (ROV/ROT) interfaces are covered by this standard. It is applicable to the selection, design, and operation of ROTs and ROTs including ROV tooling, hereafter defined in a common term as subsea intervention systems.

This document was written to include the information from RP 17M, 1st Edition (2004). With the release of RP 17H, 2nd Edition (2013), RP 17M is withdrawn. Pages: 83

2nd Edition | June 2013 | Product Number: G17M02 | Price: $160.00

Spec 17N/ISO 13628-12:2009

Provides recommendations for development and design of remotely operated subsea tools and interfaces on subsea production systems in order to maximize the potential of standardizing equipment and design principles. This document does not cover manned intervention, internal wellbore intervention, internal flowline inspection, tree running, and tree running equipment. However, all the related subsea remotely operated vehicle/remotely operated tool (ROV/ROT) interfaces are covered by this standard. It is applicable to the selection, design, and operation of ROTs and ROTs including ROV tooling, hereafter defined in a common term as subsea intervention systems.

This document was written to include the information from RP 17M, 1st Edition (2004). With the release of RP 17H, 2nd Edition (2013), RP 17M is withdrawn. Pages: 83

2nd Edition | June 2013 | Product Number: G17M02 | Price: $160.00

RP 17H  ♦  Remotely Operated Tools and Interfaces on Subsea Production Systems

Provides recommendations for development and design of remotely operated subsea tools and interfaces on subsea production systems in order to maximize the potential of standardizing equipment and design principles. This document does not cover manned intervention, internal wellbore intervention, internal flowline inspection, tree running, and tree running equipment. However, all the related subsea remotely operated vehicle/remotely operated tool (ROV/ROT) interfaces are covered by this standard. It is applicable to the selection, design, and operation of ROTs and ROTs including ROV tooling, hereafter defined in a common term as subsea intervention systems.

This document was written to include the information from RP 17M, 1st Edition (2004). With the release of RP 17H, 2nd Edition (2013), RP 17M is withdrawn. Pages: 83

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

Spec 17J ♦  Specification for Unbonded Flexible Pipe

Includes Errata 1 dated September 2016

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 non-metallic 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. Pages: 90

4th Edition | May 2014 | Effective Date: November 1, 2014
Product Number: G017J04 | Price: $135.00

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 non-metallic reinforcing layers, though no effort was made to address the specific and unique technological aspects of this product.

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

2nd Edition | November 2005 | Effective Date: May 1, 2006
Reaffirmed: September 2016 | Product Number: GX17K02 | Price: $151.00
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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**Spec 17L1**

**Specification for Flexible Pipe Ancillary Equipment**

(includes Errata 1 dated January 2015 and Errata 2 dated November 2015)

 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, documentation, 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 buoy; 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. This document does not cover flexible pipe ancillary equipment beyond the requirements specific to these applications. This document applies to the following flexible pipe ancillary equipment: bend stiffeners; bend restrictors; bellmouths; buoyancy modules and ballast modules; subsea buoy; 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. This document does not cover flexible pipe ancillary equipment beyond the requirements specific to these applications.

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**RP 17L2**

**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 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 buoy; 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 turt structures or I-tubes and J-tubes, for example. In addition, this document does not cover flexible pipe storage devices such as reels, for example. This specification is intended to cover ancillary equipment made from several material types, including metallic, polymer and composite materials. It may also refer to metallic types for particular ancillary components that are not commonly used for such components currently, but may be adopted more frequently in the future.

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**RP 17N**

**Recommended Practice for Subsea Production System Reliability and Technical Risk Management**

Provides a structured approach that organizations can adopt to manage this uncertainty throughout the life of a project. This may range from the management of general project risk through to the identification and removal of potential failure modes in particular equipment. This API recommended practice aims to provide operators, contractors, and suppliers with guidance in the application of reliability techniques to subsea projects within their scope of work and supply only. It is applicable to: standard and non-standard equipment and all phases of projects from feasibility studies to operation. This API recommended practice does not prescribe the use of any specific equipment or limit the use of any existing installed equipment or indeed recommend any action, beyond good engineering practice, where current reliability is judged to be acceptable. It is also not intended to replace individual company processes, procedures, document nomenclature, or numbering; it is a guide. However, this recommended practice may be used to enhance existing processes, if deemed appropriate. Most organizations will find much that is familiar and recognized as good practice. Some sections of the annex may only be of interest to the reliability specialist. The basic approach, however, is simple and consistent and when applied correctly has the potential to greatly reduce the financial risk of designing, manufacturing, installing, and operating subsea equipment.

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**RP 17P**

**Recommended Practice for Subsea High Integrity Pressure Protection Systems (HIPPS)**

Addresses the requirements for the use of high integrity pressure protection systems (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.
RP 17Q
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. These resources include an index of components and individual PQS documents. Documents relating to manufacturing inspection and Factory Acceptance Testing are outside the scope of this document. 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 | 2-Year Extension: June 2012
Product Number: G17Q01 | Price: $134.00

RP 17R
Recommended Practice for Flowline Connectors and Jumpers
Addresses specific requirements and recommendations for subsea flowline connectors and jumpers 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 document covers subsea flowline connectors and jumpers used for pressure containment in both subsea production of oil and gas, and subsea injection services. Equipment within the scope of this document are listed below. Equipment used to make the following subsea connections are included:

• pipeline end terminations to manifolds,
• pipeline end terminations to trees,
• pipeline end terminations to riser bases,
• manifolds to trees,
• pipeline inline sleds to other subsea structures.
The following connection components and systems are included:

• jumper assemblies,
• monobore connectors systems,
• multibore connectors systems,
• pressure and flooding caps,
• connector actuation tools. Pages: 52
1st Edition | March 2015 | Product Number: G17R01 | Price: $120.00

RP 17S
Recommended Practice for the Design, Testing, and Operation of Subsea Multiphase Flow Meters
Provides recommendations for the sizing, specification, system integration, and testing of subsea flow meters [referred to as multiphase flow meters (MPMFs)] for measurement of full stream, multiphase flow. In subsea applications, MPMFs are normally used in well testing, allocation measurement, fiscal measurement, well management, and/or flow assurance applications. The categorization of MPMF application is important since it can be used to determine the required level of factory testing, independent verification, field maintenance, and ongoing verification required during operation. This document includes wet gas flow meters as a subset of MPMFs. In-line MPMFs are typically used in subsea applications and are the focus of this document. These recommendations and guidelines are intended for use by the engineer responsible for the delivery of the MPMF. Pages: 32
1st Edition | June 2015 | Product Number: G17S01 | Price: $85.00

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 Aging 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 aging 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 annuli other than the production tubing (commonly referred to as the "A" annulus) could be monitored. Current industry standards (Spec 17D and ISO 13628-4) require that all annuli be monitored for sustained casing pressure and that every occurrence of sustained casing pressure be reported immediately. The study concludes that the risks outweigh the benefits since the risk of maintaining the pressure barrier using a wellhead with penetrations is approximately 2.5 times that of a system without penetrations. The scope of this study is limited to completed subsea wells in the Gulf of Mexico (GOM). The risks were evaluated using fault tree analysis for three systems:

• wellhead system without penetrations,
• wellhead system with one penetration, and
• wellhead system with two penetrations. Pages: 123
1st Edition | November 2004 | Product Number: G17TR31 | Price: $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 internal pressure rating of well control equipment. Pages: 12
2nd Edition | May 2016 | Product Number: G17TR402 | 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 (CIs). 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 (PCF) conduits and associated connectors/fittings. In the context of design, this covers not only installed subsea hardware (trees, manifolds, etc.) and the connecting linkages (jumpers 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 document also addresses the issues of topside equipment that provide the control and chemical injection (CI) 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. The document is intended for use by chemical suppliers to facilitate the provision of chemicals compatible with existing and intended subsea production systems (SPSs) 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.

This document specifies parameters that address manufacture, storage, and transportation of the production chemical, as well as its deployment using the SPS chemical injection system. The document provides for two approaches, requiring that parameters be either:

- measured and reconciled with SPS design and operation, or
- meet, or exceed, acceptance criteria specified, either in this document or by manufacturers of production chemicals or equipment used to deliver production chemicals.

This document is intended to be applicable to all subsea developments, irrespective of whether the development is in shallow or deep water. Pages: 42

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

TR 17TR8
High-Pressure High-Temperature Design Guidelines

Provides design guidelines for oil and gas subsea equipment utilized in high-pressure high-temperature (HPHT) environments. For the purpose of the technical report, HPHT environments are intended to be one or a combination of the following well conditions:

- the completion of the well requires completion equipment or well control equipment assigned a pressure rating greater than 15,000 psia (15 ksi, 103.43 MPa) or a temperature rating greater than 350 °F (177 °C);
- the maximum anticipated surface pressure including shut-in tubing pressure is greater than 15,000 psia (15 ksi, 103.43 MPa) on the seafloor for a well with a subsea wellhead or tied back to the surface and terminated with surface operated equipment; or
- the flowing temperature is greater than 350 °F (177 °C) on the seafloor.

Service temperature ratings above 550 °F (288 °C) are outside the scope of this technical report.

This technical report is intended to serve as a general design guideline for HPHT application. Other subsea task groups and subcommittees may elect to adopt a portion or all of the presented guidelines for HPHT application, subject to their component hardware and application-related design constraints. Pages: 74

1st Edition | February 2015 | Product Number: G17TR81 | Price: $120.00

TR 17TR10
Subsea Umbilical Termination (SUT) Design Recommendations

Provides best practice technical guidance for subsea umbilical design (SUT) design, in order to aid in making informed choices during the design phase. This document was generated in response to the increasing difficulties in installation of high-functionality SUTs, due to their increasing size.

This document is intended to be used as a reference guide by operators, umbilical termination assembly (UTA) and umbilical specifier, installers, and front-end engineering design (FEED) companies. It is also intended to be used as a reference document to enable reviews to be undertaken to ensure that installation risk has been properly considered as part of SUT design and operation reviews.

Additionally, the document has been designed to be educational such that persons new to the industry, or, less experienced persons within the industry, can understand the implications of UTA design on installation feasibility.

This document aims at capturing the primary aspects impacting on the overall dimensions and weight of the UTA, and highlighting the consequences of design choices.

This document excludes multibore hub connection-type (MHC) UTAs that can connect the umbilical directly to other subsea hardware. Although MHC UTAs are out of scope, many of the guidelines in this document would apply. Pages: 66

1st Edition | December 2015 | Product Number: G17TR101 | Price: $104.00

TR 17TR11
Pressure Effects on Subsea Hardware During Flowline Pressure Testing in Deep Water

Provides guidance to the industry on allowable pressure loading of subsea hardware components that can occur during hydrotesting of subsea flowlines and risers and during pre-commissioning leak testing of these systems. There are potential problems with confusion arising from high hydrostatic pressure in deep water, partially due to the variety of applicable test specifications and partly from the inconsistent use of a variety of acronyms for pressure terminology. Pages: 11

1st Edition | September 2015 | Product Number: G17TR111 | Price: $80.00

TR 17TR12
Consideration of External Pressure in the Design and Pressure Rating of Subsea Equipment

Addresses issues related to the effects of external pressure acting on subsea equipment installed in deepwater for containing or controlling wellbore fluids. External pressure at deepwater can significantly reduce the differential pressure acting on the wall of subsea equipment; therefore, this can improve its internal pressure containment capability. External pressure is typically ambient seawater pressure, but in some cases, external pressure may be due to the hydrostatic head of drilling mud, completion fluids, or other fluids contained within risers or other conduits that connect the subsea equipment to surface facilities.

This document provides guidance for subsea equipment designers/manufacturers to properly account for external pressure (or in some cases, differential pressure) when designing and validating subsea equipment.

Additionally, this technical report provides guidance to equipment purchaser/end-user to appropriately select rated equipment for their subsea systems with consideration to the effects of external pressure in addition to internal pressure, including differential pressure across a closing mechanism, and other applied mechanical or structural loads under all potential operating scenarios and functionality criteria.

It is necessary that users of this technical report be aware of regulations from jurisdictional authority that may impose additional or different requirements to the consideration of external pressure or differential pressure in equipment designs. Pages: 28

1st Edition | March 2015 | Product Number: G17TR121 | Price: $95.00
TR 17TR13

general overview of Subsea Production Systems

Subsea production systems can range in complexity from a single satellite well with a flowline linked to a fixed platform to several wells on a template producing and transferring via subsea processing facilities to a fixed or floating facility or directly to an onshore installation. The objectives of this document are to describe typical examples of the various subsystems and components that can be combined, in a variety of ways, to form complete subsea production systems; to describe the interfaces with typical downhole and topsides equipment that are relevant to subsea production systems; and to provide some basic design guidance on various aspects of subsea production systems. Pages: 100

1st Edition | March 2016 | Product Number: G17TR131 | Price: $120.00

RP 17U

Recommended practice for Wet and Dry Thermal Insulation of Subsea Flowlines and Equipment

Provides guidance for the performance, qualification, application, quality control, handling, and storage requirements of wet and dry thermal insulation for subsea applications in the petroleum and gas industries. This guideline also covers the inspection of the insulation, and the repair of insulation defects. For flowlines, the installation method is not defined and may be either S-lay, J-lay, or reel-lay. This guideline is intended to cover all three installation methods. This guideline also takes into consideration the design and structural handling of subsea trees, manifolds, pipeline end terminations (PLETs), flowline jumpers, etc.,... as it pertains to the placement of structure, sacrificial anodes, handling appurtenances, etc., to ensure the integrity of the insulation's construction.

This recommended practice is applicable to the following systems and components:
- flowlines and risers;
- christmas tree, valve block, and piping;
- manifold valves and pipework;
- PLET piping;
- jumpers (i.e. piping and bends);
- connectors and fittings;
- valves and chokes. Pages: 24

1st Edition | February 2015 | Product Number: G17U01 | Price: $75.00

RP 17V

Recommended Practice for Analysis, Design, Installation, and Testing of Safety Systems for Subsea Applications

(includes Errata 1 dated July 2015)

Presents recommendations for designing, installing, and testing a process safety system for subsea applications. The basic concepts of subsea safety systems are discussed and protection methods and requirements of the system are outlined. For the purposes of this document, "subsea system" includes all process components from the wellhead (and surface controlled subsurface safety valve [SCSSV]) to upstream of the boarding shutdown valve. For gas injection, water injection, and gas lift systems, the shutdown valve is within the scope of this document.

This document is a companion document to RP 14C, which provides guidance for topsides safety systems on offshore production facilities. Some sections of this document refer to RP 14C for safety system methodology and processes. This recommended practice illustrates how system analysis methods can be used to determine safety requirements to protect any process component. Actual analyses of the principal components are developed in such a manner that the requirements determined will be applicable whenever the component is used in the process. The safety requirements of the individual process components may then be integrated into a complete subsea safety system. The analysis procedures include a method to document and verify system integrity. The uniform method of identifying and symbolizing safety devices is presented in RP 14C and adopted in this recommended practice. Pages: 63

1st Edition | February 2015 | Product Number: G17V01 | Price: $140.00

RP 17W

Recommended Practice for Subsea Capping Stacks

Contains subsea capping stack recommended practices for designing, building, and using, as well as maintaining and testing during storage. The document focuses on:
- topics for drafting a Basis of Design (BOD) document that could be used to constructing a new subsea capping stack,
- topics that may drive improvements for existing subsea capping stack equipment, and
- topics for drafting plans for storing, transporting, maintaining, and testing a subsea capping stack.

Other important elements of a complete subsea capping stack system that are addressed in this document include:
- minimal documentation requirements,
- minimal analysis and modeling that should accompany any subsea capping stack design,
- competencies of personnel who operate, maintain, and test subsea capping stacks, and
- potential unknowns/risks that may be encountered with incident wells that impact the use of a subsea capping stack and relevant contingency procedures.

While it is not within the scope of this document to recommend procedures to use a subsea capping stack, this document does contain example procedures for reference only. These procedures are not presented as a recommended practice but rather to indicate to industry that the preparation and use of such procedures is a recommended practice. Pages: 65

1st Edition | July 2014 | Product Number: G17W01 | Price: $125.00

Completion equipment

Spec 11D1/ISO 14310:2008

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 specification includes the following annexes:
- Annex A: Use of API Monogram by Licensees;
- Annex B: Requirements for HPHT Environment Equipment;
- Annex C: Requirements for HPHT Environment Operational Tools;

This edition of Spec 11D1 is the modified national adoption of ISO 14310:2008. Pages: 62

3rd Edition | April 2015 | Effective Date: October 9, 2015

Product Number: G11D103 | Price: $115.00

RP 11V5

Recommended Practices for Operation, Maintenance, Surveillance, and Troubleshooting of Gas-Lift Installations

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


Product Number: G11V53 | Price: $155.00
This publication is a new entry in this catalog.

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

Spec 19G1/ISO 17078-1:2004 ♦
Side-Pocket Mandrels
(includes Errata 1 dated December 2014)

Provides requirements for side-pocket mandrels used in the petroleum and natural gas industry. This document includes specifying, selecting, designing, manufacturing, quality control, testing, and preparation for shipping of side-pocket mandrels. This specification does not address nor include requirements for end connections between the side-pocket mandrels and the well conduit. The installation and retrieval of side-pocket mandrels is outside the scope of this part of ISO 17078. Additionally, this International Standard does not include specifications for center-set mandrels, or mandrels that employ or support tubing-retrievable flow control devices. This specification does not include gas-lift or any other flow-control valves or devices, latches, and/or associated wire line equipment that may or may not be covered in other ISO specifications.

The side-pocket mandrels to which this specification refers are independent devices that can accept installation of flow control or other devices down-hole. This edition of Spec 19G1 is the modified national adoption of ISO 17078-1:2004.

Product Number: GG19G11 | Price: $103.00


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. Additionally, it includes information regarding performance testing and calibration procedures.

The installation and retrieval of flow-control devices is outside the scope of Spec 19G2. Additionally, Spec 19G2 is not applicable to flow-control devices used in center-set mandrels or with tubing-retrievable applications. Spec 19G2 does not include requirements for side-pocket mandrels, running, pulling, and kick-over tools, and latches that might or might not be covered in other API/ISO specifications. Reconditioning of used flow-control devices is outside of the scope of Spec 19G2.

This edition of Spec 19G2 is the modified national adoption of ISO 17078-2:2007.

Product Number: GX19G21 | Price: $155.00


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. Additionally, it includes information regarding performance testing and calibration procedures.

The processes of installation, 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.

*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 supersed 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.
Exploration and Production

Fax Orders: +1 303 397 2740
Online Orders: global.ihs.com

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, manufacturing, functional evaluation, repair, redress, handling, and storage. Subsurface barrier valves provide a means of isolating the formation or creating a barrier in the tubular to facilitate the performance of pre- and/or post-production/injection operational activities in the well.

The subsurface barrier valve is not designed as an emergency or fail-safe flow controlling safety device.

This International Standard does not cover installation and maintenance, 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, and 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 International Standard does not cover the connections to the well conduit.

This edition of Spec 19V is the modified national adoption of ISO 28781:2010. Pages: 58
1st Edition | May 2013 | Product Number: GG19V01 | Price: $150.00

SUPPLY CHAIN MANAGEMENT

Spec 20A
Carbon Steel, Alloy Steel, Stainless Steel, and Nickel Base Alloy Castings for Use in the Petroleum and Natural Gas Industry (includes Addendum 1 dated October 2013, Addendum 2 dated April 2015, and Errata 1 dated August 2015)
Specifies requirements for the design, qualification, production, marking, and documentation of steel and nickel base alloy castings used in the petroleum and natural gas industries. This standard applies to castings used in the manufacture of pressure containing, pressure controlling, and primary load bearing components. This standard establishes requirements for four casting specification levels (CSL) that 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
Open Die Shaped 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: 30
2nd Edition | October 2015 | Product Number: G20C02 | Price: $81.00

Std 20D
Nondestructive Examination Services for Equipment Used in the Petroleum and Natural Gas Industry (includes Addendum 1 dated October 2016)
Specifies requirements for the design, development and qualification of nondestructive examination methods used in the manufacturer of equipment for the petroleum and natural gas industries. This is applicable to suppliers providing nondestructive examination (NDE) services for equipment used in the oil and natural gas industries. The requirements of this standard apply to magnetic particle, liquid penetrant, radiographic, and ultrasonic methods of nondestructive examination. Pages: 21
1st Edition | September 2013 | Product Number: G20D01 | Price: $85.00

Spec 20E
Alloy and Carbon Steel Bolting for Use in the Petroleum and Natural Gas Industries (includes Errata dated October 2014)
Specifies requirements for the qualification, production, and documentation of alloy and carbon steel bolting used in the petroleum and natural gas industries. This standard applies to bolting used in pressure-containing and primary load-bearing oil and gas equipment. This standard establishes requirements for three bolting specification levels (BSL) that define different levels of technical, quality, and qualification requirements. Pages: 19
1st Edition | August 2012 | Product Number: G20E01 | Price: $74.00

Spec 20F
Corrosion Resistant Bolting for Use in the Petroleum and Natural Gas Industries
Establishes requirements for two bolting specification levels (BSLs). These two BSL designations define different levels of technical, quality, and qualification requirements. The levels are designated as BSL-2 and BSL-3. BSL-2 includes requirements in addition to those stated in the ASTM A453 and Std A718. BSL-3 adds technical, quality and qualification criteria to BSL-2, BSL-2 and BSL-3 are intended to be comparable to BSL-2 and BSL-3 as found in Spec 20E. BSL-1 is omitted from this specification. This specification covers the following product forms, processes, and sizes:

- machined studs;
- machined bolts, screws, and nuts;
- 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;
- hot formed nuts ≥1.5 in. (38.1 mm) nominal diameter.

1st Edition | June 2015 | Product Number: G20F01 | Price: $75.00
Exploration and Production

Std 20H
Heat Treatment Services—Batch Type for Equipment Used in the Petroleum and Natural Gas Industry

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

1st Edition | October 2015 | Product Number: G20H01 | Price: $65.00

DRILLING AND PRODUCTION OPERATIONS

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

Product Number: G31A01 | Price: $97.00

RP 45
Recommended Practice for 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

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

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

Product Number: G50002 | Price: $109.00

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

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

3rd Edition | March 2001 | Reaffirmed: January 2013
Product Number: G51003 | Price: $51.00

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

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

Product Number: G51R01 | Price: $76.00
You may download a PDF of this document from the Policy & Issues/Hydraulic Fracturing section of the API website.

RP 52
Land Drilling Practices for Protection of the Environment

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

2nd Edition | July 1995 | Reaffirmed: September 2010
Product Number: G52002 | Price: $115.00

RP 68
Recommended Practice for Oil and Gas Well Servicing and Workover Operations Involving Hydrogen Sulfide

Addresses personnel training, personnel protective equipment, contingency planning, and emergency procedures. Also included are classification of locations, materials and equipment, operations, rig practices, special operations, offshore operations, characteristics of hydrogen sulfide and sulfur dioxide, and evaluation and selection of hydrogen sulfide monitoring equipment. Pages: 54

Product Number: G68001 | Price: $76.00

RP 80
Guidelines for the Definition of Onshore Gas Gathering Lines

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

1st Edition | April 2000 | Reaffirmed: January 2013
Product Number: G80001 | Price: $125.00

This publication is related to an API licensing, certification, or accreditation program.
RP 90
Annular Casing Pressure Management for Offshore Wells

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

1st Edition | August 2006 | Reaffirmed: January 2012
Product Number: G09001 | Price: $182.00

RP 90-2
Annular Casing Pressure Management for Onshore Wells

Serves as a guide to monitor and manage annular casing pressure (ACP) in onshore wells, including production, injection, observation/monitoring, and storage wells. This document applies to wells that exhibit thermally induced, operator-imposed, or sustained ACP. It includes criteria for establishing diagnostic thresholds (DTs), monitoring, diagnostic testing, and documentation of ACP for onshore wells. Also included is a discussion of risk management considerations that can be used for the evaluation of individual well situations where the annular casing pressure falls outside the established diagnostic thresholds.

This document recognizes that an ACP outside of the established DTs can result in a risk to well integrity. The level of risk presented by ACP depends on many factors, including the design of the well, the performance of barrier systems within the well, the source of the annular casing pressure, and whether there is an indication of annular flow exists. This document provides guidelines in which a broad range of casing annuli that exhibit annular casing pressure can be managed while maintaining well integrity. Pages: 60

1st Edition | April 2016 | Product Number: G090201 | Price: 182.00

Bull 92L
Drilling Ahead Safely with Lost Circulation in the Gulf of Mexico

Identifies items that should be considered to safely address lost circulation challenges when the equivalent circulating density (ECD) exceeds the fracture gradient. It addresses drilling margins and drilling ahead with mud losses, which are not addressed in Std 65-2. It provides guidance when lost circulation is experienced with either surface or subsea stack operations (excluding diverter operations). These practices may apply to other Outer Continental Shelf (OCS) environments such as offshore California and Florida.

Lost circulation during drilling operations, in the form of both seepage and fracture losses, is a common occurrence in the Gulf of Mexico and other OCS environments. Through extensive practical experience, operators and drilling contractors have learned that with proper information, planning, and execution, lost circulation can be safely managed to allow well construction goals to be met. The methods used to repair or manage lost circulation are based on well location, geology, pore and fracture pressures, drilling depth, well design, hydraulics, mud properties, and available contingencies.

Pages: 14

1st Edition | August 2015 | Product Number: G92L01 | Price: $70.00

RP 92U
Underbalanced Drilling Operations
(includes Addendum 1 dated November 2015)

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 (BOP) installed] thereby ensuring consideration of personnel safety, public safety, integrity of the underbalanced drilling (UBD) equipment, and preservation of the environment for onshore and offshore UBD operations (including tripping of drill string). Pages: 72

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 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. Pages: 158

1st Edition | March 2013 | Product Number: G09601 | Price: $175.00
Bull 97
Well Construction Interface Document Guidelines
Contains the structure and contents 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

RP 99
Flash Fire Risk Assessment for the Upstream Oil and Gas Industry
Provides guidance for the upstream oil and gas industry on hazard identification and risk assessment exercises to assess and mitigate the risk of human injury caused by exposure to a flash fire. The scope of this document is limited to personnel exposed to the risk of hydrocarbon based flash fires in the upstream Exploration and Production (E&P) sector of the oil and gas industry. In general, this group includes oil and gas production, drilling, well bore (well servicing) operations, and gas processing prior to interstate pipeline transportation. Pages: 30
1st Edition | April 2014 | Product Number: G09901 | Price: $80.00

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 and 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)
A handbook outlining to operators of oil and gas wells what applications are possible with wireline tools and equipment. Also a guide for field personnel. Surface equipment, service tools (standard and special), and subsurface equipment (both permanent and removable) are described and illustrated. Their various applications are included. Also presented is a general discussion of special problems 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
Creating Orientation Programs for Personnel Going Offshore
Serves as a guide to develop orientation materials for personnel and visitors prior to their first trip offshore. The scope and applicability of this document concludes after check-in at the offshore facility and receipt of the facility-specific orientation. Pages: 18

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
2nd Edition | December 2001 | Reaffirmed: January 2013
Product Number: GT7002 | Price: $59.00

RP T-4
Training of Offshore Personnel in Nonoperating Emergencies
Represents an industry guide for the training of workers who work offshore. It presents recommendations for training these personnel in handling nonoperating emergencies, such as fires, transportation emergencies, platform abandonment procedures, use of survival crafts, and water survival guidelines. Pages: 3
2nd Edition | October 1995 | Reaffirmed: June 2010
Product Number: GT4002 | Price: $59.00
Exploration and Production

Fax Orders: +1 303 397 2740

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

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

1st Edition | October 2002 | Reaffirmed: January 2013
Product Number: GT0601 | Price: $59.00

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

SPECIAL PUBLICATIONS

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

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

1st Edition | November 2000 | Product Number: G13660 | Price: $83.00

RP 100-1
Hydraulic Fracturing—Well Integrity and Fracture Containment

Contains recommended practices for onshore well construction and fracture stimulation design and execution as it relates to well integrity and fracture containment. These practices cover the design and installation of well equipment that protects and isolates ground water aquifers, delivery, and execution of the hydraulic fracture treatment and contains and isolates the produced fluids. This document also addresses the design and execution of hydraulic fracturing treatments to contain the resulting fracture within a prescribed geologic interval. Fracture containment combines those parameters that are existing, those that can be established at installation, and those that can be controlled during execution. Pages: 29

1st Edition | October 2015 | Product Number: G100101 | Price: $90.00

RP 100-2
Managing Environmental Aspects Associated with Exploration and Production Operations Including Hydraulic Fracturing

Provides recommended practices applicable to the planning and operation of wells, and hydraulically fractured wells. Topics covered include recommendations for managing environmental aspects during planning; site selection; logistics; mobilization, rig-up, and demobilization; and stimulation operations. Also, this document includes guidance for managing environmental aspects during well construction; however, guidance for well construction and fracture stimulation design and execution for onshore wells that can be hydraulically fractured are described in RP 100-1. This document provides recommendations for the following topics:

- transportation of materials and equipment;
- storage and management of fluids and chemicals;
- management of solid and liquid wastes;
- air emissions. Pages: 53

1st Edition | August 2015 | Product Number: G100201 | Price: $90.00

Bull 100-3
Community Engagement Guidelines

These guidelines outline what local communities and other key stakeholders can expect from operators. Oil and gas operators acknowledge the challenges associated with industry activities, which can include challenges important to a community. Principles of integrity, transparency and consideration for community concerns underpin responsible operations. Conscientious operators are committed to helping communities achieve positive and long-lasting benefits.

Both local stakeholders and operators can use this guidance. It is designed to acknowledge challenges and impacts that occur during the industry’s presence in a given region. It provides flexible and adaptable strategies, recognizing that application will vary from operator to operator and community to community. Many operators already apply similar guidelines or processes within their operations. These suggested guidelines are typical and reasonable and generally apply under normal operating circumstances. The use of these guidelines is at each individual operator’s discretion.

Operators recognize that stakeholders within the community can have different interests, issues and levels of concern. Some of these interests can be in direct conflict with one another. Working together with stakeholders to seek mutually agreeable solutions is an important aspect of community engagement. Operators can have different approaches to addressing the concerns and issues.

These guidelines are intended primarily to support onshore oil and gas projects in the United States for shale developments; however, they can be adapted to any oil and gas projects in the United States.

This document provides non-technical guidance only, and practices included herein cannot be applicable in all regions and/or circumstances. This document does not constitute legal advice regarding compliance with legal or contractual requirements or risk mitigation. It is not intended to be all-inclusive. The operator is responsible for determining compliance with applicable legal and regulatory requirements.

1st Edition | July 2014 | Product Number: G100301 | Price: $60.00
You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

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 SPCC regulation in light of the latest rule (40 CFR Part 112) and to offer guidance for developing SPCC Plans wherever they are needed. Included is a template for developing SPCC plans (i.e. onshore excluding production; onshore oil production, oil drilling or workover; or offshore oil drilling, production, or workover) in accordance with the regulation and guidance, instruction, and clarification for completing each section of the template. The purpose of this rulemaking was to establish procedures, methods, and equipment to prevent and contain discharges of oil from non-transportation-related onshore and offshore facilities, thus preventing pollution of navigable waters of the United States. The development of this bulletin was commissioned by API and performed by O’Brien’s Response Management Inc. The purchase of D16 includes: Bulletin 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
**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 two reasons:

- 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.
- 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.

1st Edition | October 2009 | Product Number: GHF101 | Price: $42.00

You may download a PDF of this document from the Policy & Issues/Hydraulic Fracturing section of the API website.

**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.

1st Edition | June 2010 | Product Number: GHF201 | Price: $42.00

You may download a PDF of this document from the Policy & Issues/Hydraulic Fracturing section of the API website.

**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.

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

You may download a PDF of this document from the Policy & Issues/Hydraulic Fracturing section of the API website.

*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.*
Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities—Chinese

Chinese translation of RP 75.

3rd Edition | May 2004 | Product Number: G07503C | Price: $63.00

Bull 75L

Guidance Document for the Development of a Safety and Environmental Management System for Onshore Oil and Natural Gas Production Operations 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

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 | Reaffirmed: January 2013
Product Number: G07602 | Price: $57.00

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Exploration and Production

HEALTH, ENVIRONMENT, AND SAFETY: GENERAL

Achieving Common Sense Environmental Regulation: Oil and Gas Exploration & Production

Discusses proposals to achieve a balanced approach to environmental regulation of the oil and gas exploration and production industry that protects the environment as well or better than the current system and does the job more efficiently. Pages: 36
May 1996 | Product Number: G13715 | Price: Free*

Exploration and Production: Protecting the Environment

Discusses work the E&P industry does to protect the environment while exploring for and producing oil and natural gas. Describes a number of innovative and socially responsible actions taken by exploration and production companies to minimize impacts to air, water, land, and wildlife. This document is only available in a PDF format. Pages: 24
September 1997 | Product Number: G13650 | Price: Free*

Bull E1
Generic Hazardous Chemical Category List and Inventory for the Oil and Gas Exploration and Production Industry (Superfund Amendments and Reauthorization Act of 1986, Emergency Planning and Community Right-to-Know Act) (includes Errata 1 dated September 1991)

Under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986, owners and operators of oil and gas exploration and production facilities must provide to state and local emergency response agencies information on hazardous chemicals they produce or use. This bulletin provides a simplified means of compliance with these regulations. Pages: 86
Product Number: G11000 | Price: $142.00

Bull E2

Addresses the environmental concerns related to well abandonment and inactive well practices. The primary environmental concerns are protection of freshwater aquifers from fluid migration; and isolation of hydrocarbon production and water injection intervals. Additional issues in the document include protection of surface soils and surface waters, future and use, and permanent documentation of plugged and abandoned wellbore locations and conditions. Pages: 52
Product Number: G11007 | Price: $142.00

Bull E3
Environmental Guidance Document: Release Reporting for the Oil and Gas Exploration and Production Industry as Required by the Clean Water Act, the Comprehensive Environmental Response, Compensation and Liability Act, and the Emergency Planning and Community

Developed to provide the oil and gas production industry guidance on reporting releases of hazardous substances and petroleum to water as required by the Clean Water Act (CWA) and reporting releases of hazardous substances into the environment as required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Emergency Planning and Community Right-to-Know Act (EPCRA). Also covers the reporting of what most in the industry consider "emergency" releases, which are unplanned and typically are not covered under a permit issued by a government agency. Pages: 106
2nd Edition | May 2003 | Product Number: GE4002 | Price: $169.00

Bull E4
A Naturally Occurring Radioactive Material (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

Bull E5
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

Bull E6
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

Bull E7
Management and Disposal Alternatives for Naturally Occurring Radioactive Material (NORM) Wastes in Oil Production and Gas Plant Equipment

Presents radiological analyses of disposal alternatives that will protect against elevated radiation exposures and facilitate cost-effective precautions that are proportionate to any hazards posed by the NORM. Four waste forms and 12 waste disposal alternatives were analyzed. Pages: 65
October 1997 | Product Number: G71031 | Price: $115.00
Exploration and Production

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**SECURITY**

**API Standard for Third Party Network Connectivity**

Provides guidance for implementing secure third-party connections between the information technology systems and a network of two companies that have a business relationship and a common objective. The standard provides suggestions for companies to follow 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

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

The American Petroleum Institute and the National Petrochemical & Refiners Association jointly developed a new methodology for evaluating the likelihood and consequences of terrorist attacks against refineries and petrochemical facilities. **Security Vulnerability Assessment Methodology for Petroleum and Petrochemical Facilities** is designed for companies to use in assessing vulnerabilities and potential damages from different kinds of terrorist attacks. In the post September 11 era, companies have reevaluated assessing vulnerabilities and potential damages from different kinds of terrorist attacks. 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

**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: G70I03 | Price: $61.00

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**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

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**GUIDELINES FOR COMMERCIAL EXPLORATION AND PRODUCTION WASTE MANAGEMENT**

Provides guidelines for the design and operations of commercial E&P waste management facilities to allow operators to identify areas where their facility could have impacts on the surrounding community and environment, and gives options for preventing/reducing those impacts. The guidelines are not meant to supersede any applicable local, state, or federal requirements. Pages: 80


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**PROBABLISTIC 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: G7105 | Price: $115.00

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**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

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

Provides guidelines for the design and operations of commercial E&P waste management facilities to allow operators to identify areas where their facility could have impacts on the surrounding community and environment, and gives options for preventing/reducing those impacts. The guidelines are not meant to supersede any applicable local, state, or federal requirements. Pages: 80


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**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: IOPL06 | For a free copy, please visit www.api.org/aboutoilgas/sectors/explore/livestock.cfm

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

Chapter 2.2C/ISO 7507-3:1993
Calibration of Upright Cylindrical Tanks Using the Optical-Triangulation Method

(ANSI/API MPMS Ch. 2.2C-2002)

Describes the calibration of vertical cylindrical tanks by means of optical triangulation using theodolites. The method is an alternative to other methods such as strapping (Ch. 2.2A) and the optical-reference-line method (Ch. 2.2B).

This edition of Ch. 2.2C is the modified 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 Ch. 2.2D-2003)

Specifies a method for the calibration of upright cylindrical tanks having diameters greater than 5 m by means of internal measurements using an electro-optical distance-ranging instrument, and for the subsequent compilation of tank capacity tables.

This edition of Ch. 2.2D is the modified national adoption of ISO 7507-4:1995. Pages: 13

Product Number: H022D1 | Price: $83.00

Chapter 2.2E/ISO 12917-1:2002

(includes Errata 1 dated November 2009)

(ANSI/API MPMS Ch. 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 chapter is applicable to tanks inclined by up to 10 % from the horizontal provided a correction is applied for the measured tilt. For tanks over and above these dimensions and angle of tilt, appropriate corrections for tilt and appropriate volume computations should be based on the “Coats” equation.

This edition of 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 Ch. 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 (EODR) method.

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

1st Edition | April 2004 | Reaffirmed: September 2014
Product Number: HH202F01 | Price: $77.00

Chapter 2.2G
Calibration of Upright Cylindrical Tanks Using the Total Station Reference Line Method

Describes measurement and calculation procedures for determining the diameters of upright cylindrical tanks by taking vertical offset measurements externally using electro-optical distance ranging equipment rather than conventional ORLM plummet/trolley equipment. This standard is an alternate standard to Ch. 2.2B. This standard is used in conjunction with Ch. 2.2A. Calibration of insulated tanks is covered by Ch. 2.2D. Abnormally deformed tanks that are dented or have other visible signs of damage are not covered by this standard.


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

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

Std 2555
Liquid Calibration of Tanks

Describes the procedure for calibrating tanks, or portions of tanks, larger than a barrel or drum by introducing or withdrawing measured quantities of liquid.

1st Edition | September 1966 | Reaffirmed: May 2014
Product Number: H25550 | Price: $97.00

RP 2556
Correcting Gauge Tables for Incrustation

Incrustation is defined in this publication as any material that adheres to the internal vertical sidewall surfaces of a tank when the tank is otherwise empty. The tables given in this recommended practice show the percent of error of measurement caused by varying thicknesses of uniform incrustation in tanks of various sizes.

2nd Edition | August 1993 | Reaffirmed: November 2013
Product Number: H25560 | Price: $76.00

Chapter 2.7
Calibration of Barge Tanks

Describes three methods for determining the total incremental volumes of liquids in barge tanks for coastal and inland waterway service that have integral hull tanks. The three methods are as follows.

- Liquids calibration.
- Calibration by linear measurement.
- 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, HM2 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, HM2 Section 5B.

Product Number: H30049 | Price: $89.00

Chapter 2.8B
Recommended Practice for the 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 innage, 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: H02881 | Price: $97.00

Chapter 3
Tank Gauging

Standardized procedures for gauging liquid hydrocarbons in various types of tanks, containers, and carriers.

Chapter 3.1A
Standard Practice for the Manual Gauging of Petroleum and Petroleum Products

Describes the following:

- 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,
- procedures for manually gauging the level of free water that may be found with the petroleum or petroleum products,
- 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,
- the influences that may affect the position of gauging reference point (either the datum plate or the reference gauge point).

Throughout this standard the term petroleum is used to denote petroleum, petroleum products, or the liquids normally associated with the petroleum industry.

The method used to determine the volume of tank contents determined from gauge readings is not covered in this standard. The determination of temperature, API gravity, and suspended sediment and water of the tank contents are not within the scope of this standard.

3rd Edition | August 2013 | Product Number: H301A03 | Price: $100.00

This publication is a new entry in this catalog.

This publication is related to an API licensing, certification, or accreditation program.
Chapter 3.1A *
Spanish translation of Ch. 3.1A.
3rd Edition | August 2013 | Product Number: H301A03S | Price: $100.00

Chapter 3.1B *
Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Tanks by Automatic Tank Gauging
Covers level measurement of liquid hydrocarbons in stationary, aboveground, atmospheric storage tanks using automatic tank gauges (ATGs). This publication discusses automatic tank gauging in general, calibration of ATGs for custody transfer and inventory control, and the requirements for data collection, transmission, and receiving. The appendices discuss the operation and installation of the most commonly used ATG equipment and of the less commonly used, electronic ATGs. Pages: 17
Product Number: H301B2 | Price: $97.00

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
1st Edition | August 1995 | Reaffirmed: May 2013
Product Number: H30201 | Price: $97.00

Chapter 3.2 *
Standard Practice for Gauging Petroleum and Petroleum Products in Tank Cars—Spanish
Spanish translation of Ch. 3.2.

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 psia (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
Product Number: H30301 | Price: $83.00

Chapter 3.3 *
Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Pressurized Storage Tanks by Automatic Tank Gauging—Spanish
Spanish translation of Ch. 3.3.
1st Edition | June 1996 | Product Number: H30301S | Price: $96.00

Chapter 3.4
Standard Practice for Level Measurement of Liquid Hydrocarbons on Marine Vessels by Automatic Tank Gauging
Provides guidance on the selection, installation, calibration, and verification of automatic tank gauges 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
1st Edition | April 1995 | Reaffirmed: May 2013
Product Number: H30401 | Price: $83.00

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: H30401SP | Price: $83.00

Chapter 3.5
Standard Practice for Level Measurement of Light Hydrocarbon Liquids Onboard Marine Vessels by Automatic Tank Gauging
Covers the standard practice for level measurement of light hydrocarbon liquids onboard marine vessels by automatic tank gauges. This publication covers pressurized and refrigerated light hydrocarbon liquids. The light hydrocarbon liquids covered include: liquefied petroleum gas (LPG), natural gas liquid (NGL), and other petrochemical liquids where the storage and transportation requirements and the methods of measurement are similar to that for LPG and NGL gauging. This standard also covers the requirements for data collection, transmission, and receiving. Pages: 8
Product Number: H30501 | Price: $83.00

Chapter 3.5 *
Standard Practice for Level Measurement of Light Hydrocarbon Liquids Onboard Marine Vessels by Automatic Tank Gauging—Spanish
Spanish translation of Ch. 3.5.
1st Edition | March 1997 | Product Number: H30501S | Price: $83.00

Chapter 3.6
Measurement of Liquid Hydrocarbons by Hybrid Tank Measurement Systems
(Includes Errata 1 dated September 2005)
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
Product Number: H30601 | Price: $96.00
Chapter 4
Proving Systems
Serves as a guide for the design, installation, calibration, and operation of meter proving systems.

Chapter 4.1
Introduction
General introduction to the subject of proving. The requirements in 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

3rd Edition | February 2005 | Reaffirmed: June 2014
Product Number: H04013 | Price: $82.00

Chapter 4.1 *
Introduction—Spanish
Spanish translation of Ch. 4.1.
3rd Edition | February 2005 | Product Number: H04013S | Price: $82.00

Chapter 4.2
Displacement Provers
(includes Addendum 1 dated February 2015)
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

Product Number: H04023 | Price: $123.00

Chapter 4.4
Tank Provers
Specifies the characteristics of tank provers that are in general use and the procedures for their calibration. This standard does not apply to weir-type, vapor-condensing, dual-tank water-displacement, or gas-displacement provers. Pages: 11

Product Number: H04042 | Price: $83.00

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: 24


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

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Chapter 4.9.3
Methods of Calibration for Displacement and Volumetric Tank Provers, Part 3—Determination of the Volume of Displacement Provers by the Master Meter Method of Calibration

Covers the procedures required to determine the field data necessary to calculate a base prover volume (BPV) 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 | Reaffirmed: March 2015
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 USC and SI 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 national metrology institutes are referenced by their acronyms. Pages: 8

1st Edition | October 2010 | Reaffirmed: December 2015
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

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. Ch. 5 also includes information that will assist in troubleshooting and improving the performance of meters. Pages: 8

Product Number: H505014 | Price: $94.00

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

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

Product Number: H05023 | Price: $87.00

Chapter 5.2 *
Measurement of Liquid Hydrocarbons by Displacement Meters—Spanish

Spanish translation of Ch. 5.2.

3rd Edition | October 2005 | Product Number: H50203SP | Price: $87.00

Chapter 5.3
Measurement of Liquid Hydrocarbons by Turbine Meters

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

Product Number: H05035 | Price: $106.00

Chapter 5.3 *
Measurement of Liquid Hydrocarbons by Turbine Meters—Spanish

Spanish translation of Ch. 5.3, including Addendum 1 dated July 2009.

5th Edition | September 2005 | Product Number: H50305SP | 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

Chapter 5.4 *
Accessory Equipment for Liquid Meters—Spanish

Spanish translation of Ch. 5.4.


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

Product Number: H50502 | Price: $70.00

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Chapter 5.5 *
Fidelity and Security of Flow Measurement Pulsed-Data Transmission Systems—Spanish

Chapter 5.6
Measurement of Liquid Hydrocarbons by Coriolis Meters

Chapter 5.8
Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters

Chapter 6
Metering Assemblies

Chapter 6.1
Lease Automatic Custody Transfer (LACT) Systems

Chapter 6.2
Loading Rack Metering Systems

Chapter 6.5
Metering Systems for Loading and Unloading Marine Bulk Carriers

Chapter 6.6
Pipeline Metering Systems

Chapter 6.7
Metering Viscous Hydrocarbons

Chapter 7
Temperature Determination

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Chapter 7.3
Temperature Determination—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 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

Product Number: H70302 | Price: $83.00

Chapter 7.3 *
Temperature Determination—Fixed Automatic Tank Temperature Systems—Spanish

Spanish translation of Ch. 7.3.

2nd Edition | October 2011 | Product Number: H70302SP | Price: $83.00

Chapter 7.5/ISO 8310:2012
Temperature Determination—Automatic Tank Temperature Measurement Onboard Marine Vessels Carrying Refrigerated Hydrocarbon and Chemical Gas Fluids
(ANSI/API MPMS Ch. 7.5)

Specifies the essential requirements and verification procedures for automatic tank thermometers (ATTs) consisting of platinum resistance thermometers (PRT) and an indicating device used for custody transfer measurement of liquefied natural gas, liquefied petroleum, and chemical gases on board ships. Temperature detectors other than PRT are considered acceptable for use in the custody transfer service of liquefied gases if they meet the performance requirements of this document and are approved by national regulations. Pages: 12

1st Edition | September 2014 | Product Number: H70501 | Price: $95.00

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
(ASM 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

Chapter 8.2
Standard Practice for Automatic Sampling of Petroleum and Petroleum Products
(ASM D4177)

Describes general procedures and equipment for automatically obtaining samples of liquid petroleum and petroleum products, crude oils, and intermediate products from the sample point into the primary container. This practice also provides additional specific information about sample container selection, preparation, and sample handling. If sampling is for the precise determination of volatility, use Ch. 8.4 (ASTM Practice D5842) in conjunction with this practice. For sample mixing and handling, refer to Ch. 8.3 (ASTM Practice D5854). This practice does not cover sampling of electrical insulating oils and hydraulic fluids. Pages: 45


Chapter 8.3
Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products
(includes Errata 1 dated March 1996)
(ANSI/ASTM D5854)

Covers the handling, mixing, and conditioning procedures required to ensure that a representative sample of the liquid petroleum or petroleum product is delivered from the primary sample container/receiver into the analytical test apparatus or into intermediate containers. For sampling procedures, refer to 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

Product Number: H80301 | Price: $89.00

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 8.4
Standard Practice for Sampling and Handling of Fuels for Volatility Measurement
(ASM D5842)

Covers procedures and equipment for obtaining, mixing, and handling representative samples of volatile fuels for the purpose of testing for compliance with the standards set forth for volatility related measurements applicable to light fuels. The applicable dry vapor pressure equivalent range of this practice is 13 to 105 kPa (2 to 16 psia).

This practice is applicable to the sampling, mixing, and handling of reformulated fuels including those containing oxygenates. Pages: 7


*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 8.5
Includes the equipment and procedures for obtaining a representative sample of “live” or high vapor pressure crude oils, condensates, and/or liquid petroleum products from low pressure sample points, where there is insufficient sample point pressure to use a floating piston cylinder (FPC) as described in ASTM D3700. Pages: 20
1st Edition | December 2015 | Product Number: H80501 | Price: $50.00

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.
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 (Ch. 11.5) or volume correction factors (Ch. 11.1), or both, or tables, as applicable. Pages: 8

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 (Ch. 11.1) or 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 (Ch. 11.5), or volume correction factors (Ch. 11.1) or Ch. 11.2.4 (GPA TP-27), as applicable. Pages: 6
3rd Edition | December 2012 | Product Number: H09023 | Price: $41.00

Chapter 9.3
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 (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 (Ch. 11.5) or volume correction factors (Ch. 11.1), or both, or tables, as applicable. Pages: 10
3rd Edition | December 2012 | Product Number: H09033 | Price: $41.00

Chapter 10
Sediment and Water

Describes methods for determining the amount of sediment and water, either together or separately in petroleum products. Laboratory and field methods are covered.

Chapter 10.1
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

Chapter 10.2
Standard Test Method of Water in Crude Oil by Distillation (ASTM D4006)
Covers the determination of water in crude oil by distillation. Pages: 11
4th Edition | December 2016 | Product Number: H100204 | Price: $50.00

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, Ch. 10.2, and sediment by extraction, Ch. 10.1, shall be used. Pages: 13
Product Number: H100304 | Price: $50.00

Chapter 10.4
Determination of Water and/or Sediment in Crude Oil by the Centrifuge Method (Field Procedure) (includes Errata 1 dated March 2015)
Describes the field centrifuge method for determining both water and 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

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. For crude oils, refer to Ch. 10.2. Pages: 6

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, Ch. 10.5 or Ch. 10.1 may be used. Pages: 7

Chapter 10.7
Standard Test Method for Water in Crude Oils by Potentiometric Karl Fischer Titration
(ANSI/ASTM D4377)
Describes the procedure for the determination of water in crude oils by Karl Fischer titration (potentiometric). This test method covers the determination of water in the range from 0.02 to 2 mass percent in crude oils. Mercaptan and sulfide (S^- or H2S) 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

Chapter 10.9 *
Standard Test Method for Water in Crude Oils by Coulometric Karl Fischer Titration—Spanish
Spanish translation of Ch. 10.9.

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 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 measurement standards. Each element of Ch. 11 must be ordered separately.

Chapter 11.1
(2004 edition of this standard also supersedes Ch. 11.2.1 and Ch. 11.2.1M)
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 gases are excluded from consideration in this standard. This document is distributed electronically in Portable Document Format (PDF) or as a hard copy, printed document.

*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.
An API 11.1 VCF Application for calculating VCF is also available. This Windows-based standalone application allows users to calculate volumes and densities at observed (RH0obs), base (RH0b), and alternate (RH0tp) conditions, combined (CTPL) and independent correction factors for temperature (CTL) and pressure (CPL). The application supports both U.S. Customary (API, RD, °F and psig) and SI (kg/m³, °C, kPa and Bar) units of measure. Thermal Expansion Factor (alpha) regression calculator and a Table Generator. The API 11.1 VCF Application is distributed on flash drive or can be electronically downloaded.

The PDF or hard copy, printed document are sold without the VCF application through the API websites.

The API 11.1 VCF windows based standalone application and the standard in PDF or print are available to purchase online via the Flow-Cal website (flowcal.com/api-standards/). You may also contact Flow-Cal, Inc. at +1 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

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

11.1 Standard Document | $240.00 per document
11.1 VCF Application | $525.00 per single user license
11.1 Standard Document + 11.1 VCF Application | $650.25
(15% discount when purchased together)

See the listing for “Chapter 11.1–1980” on page 173 of this Catalog for more information on the previous edition of the standard(s).

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 (Fp). These functions allow calculating density at base conditions or at alternate conditions, CTPL correction factor used to transform volume and density data to base or desired conditions, and the scaled compensation factor for transformation from alternate to base conditions or from observed to base conditions for generalized crude oils, refined products, and lubricating oils. They support the following process variables: density (API gravity, relative density, and kg/m³), temperature (°F and °C), and pressure (psig, bar, and kPa).

To order the Add-In, contact Flow-Cal, Inc. at +1 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

XL Add-In—runs on a single standalone computer with no network access
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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 the effect of temperature and pressure on 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 PDF or hard copy, printed document are sold without the VCF application through the API websites.

The API 11.1 VCF windows based standalone application and the standard in PDF or print are available to purchase online via the Flow-Cal website (flowcal.com/api-standards/). You may also contact Flow-Cal, Inc. at +1 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

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

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To order the Add-In, contact Flow-Cal, Inc. at +1 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

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Chapter 11.2.2
Compressibility Factors for Hydrocarbons: 0.350–0.637 Relative Density (60 °F/60 °F) and –50 °F to 140 °F Metering Temperature

Provides tables to correct hydrocarbon volumes metered under pressure for the metered temperature. Contains compressibility factors related to the meter temperature and relative density (60 °F/60 °F) of the metered material. Pages: 246

1st Edition | September 2007 | Reaffirmed: August 2012
Product Number: H27307 | Price: $171.00

Chapter 11.2.2M
Compressibility Factors for Hydrocarbons: 350–637 Kilograms per Cubic Meter Density (15 °C) and –46 °C to 60 °C Metering Temperature

Provides tables to correct hydrocarbon volumes metered under pressure to corresponding volumes at equilibrium pressure for the metered temperature. The standard contains compressibility factors related to the meter temperature and density (15 °C) of the metered material. Pages: 264

Product Number: H27309 | Price: $171.00

Chapter 11.2.4
Temperature Correction for the Volume of NGL and LPG

Tables 23E, 24E, 53E, 54E, 59E, 60E

(includes Errata 1 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 50.8 to 199.4 °F (–46 to 93 °C) temperature range which nominally equates to a density at 15 °C of 351.7 to 687.8 kg/m³ and a density at 20 °C of 331.7 to 686.6 kg/m³. The temperature range of this standard is 50.8 to 199.4 °F (–46 to 93 °C). At all conditions, the pressure is assumed to be at saturation conditions (also known as bubble point or saturation vapor pressure). Pages: 149

Product Number: H1102041 | Price: $180.00

Chapter 11.2.5
A Simplified Vapor Pressure Correlation for Commercial NGLs

(supersedes the Addendum to Ch. 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 a computerized version of these implementation procedures are presented as examples only and do not represent the standard. This standard is applicable at any operating temperature to bulk (e.g. tank trucks, tank cargos, barges) denatured 95 % to 99 % fuel ethanol containing D4806 allowed denaturants (natural gasoline, gasoline blend stocks, and unleaded gasoline) and denatured, 99+ % fuel ethanol containing less than 1 % denaturant. This standard does not apply to undenatured ethanol of any purity. Pages: 16

2nd Edition | November 2015
Product Number: H1103032 | Price: $145.00

Chapter 11.3.3.2
Propylene Compressibility

An electronic FORTRAN Source Code text file on CD-ROM that will produce a table of values applicable to liquid propylene in the following ranges: temperature, 30 °F to 165 °F, and saturation pressure to 1600 psia. It computes the following two values: density (pounds 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

(includes Errata 1 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 standards. It also specifies the volume correction factor equation for water and demonstrates its use for water calibration of volumetric provers. Pages: 14

1st Edition | December 2003 | Reaffirmed: September 2013
Product Number: H11411 | Price: $53.00

Chapter 11.5
Density/Weight/Volume Intraconversion

[includes Errata 1 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 | Reaffirmed: March 2015
Product Number: H1105CD | Price: $248.00
Chapter 11.5.1
Part 1—Conversions of API Gravity at 60 °F
Provides implementation procedures for conversion of API gravity at 60 °F to equivalent densities in both in vacuo and in air values. This standard gives the following equivalents for any value of API gravity at 60 °F:
• relative density at 60 °F (old Table 3);
• absolute density at 60 °F;
• absolute density at 15 °C (old Table 3);
• pounds per U.S. gallon at 60 °F in vacuo and in air (old Table 8);
• U.S. gallons per pound at 60 °F in vacuo and in air (old Table 8);
• short tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 9);
• U.S. gallons per short ton at 60 °F in vacuo and in air (old Table 10);
• short tons per barrel at 60 °F in vacuo and in air (old Table 9);
• barrels per short ton at 60 °F in vacuo and in air (old Table 10);
• long tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 11);
• U.S. gallons per long ton at 60 °F in vacuo and in air (old Table 12);
• long tons per barrel at 60 °F in vacuo and in air (old Table 11);
• barrels per long ton at 60 °F in vacuo and in air (old Table 12);
• metric tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 13);
• metric tons per barrel at 60 °F in vacuo and in air (old Table 13);
• barrels per metric ton at 60 °F in vacuo and in air;
• cubic metres per short ton at 15 °C in vacuo and in air (old Table 14);
• cubic metres per long ton at 15 °C in vacuo and in air (old Table 14).

While not related to API gravity, the following are included for user convenience:
• U.S. gallons at 60 °F to litres at 15 °C (old Table 4);
• barrels at 60 °F to litres at 15 °C (old Table 4).

Chapter 11.5.2
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 °C (old Table 21);
• pounds per U.S. gallon at 60 °F in and in air (old Table 26);
• U.S. gallons per pound at 60 °F in vacuo and in air (old Table 26);
• short tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 27);
• U.S. gallons per short ton at 60 °F in vacuo and in air (old Table 28);
• short tons per barrel at 60 °F in vacuo and in air (old Table 27);
• barrels per short ton at 60 °F in vacuo and in air (old Table 28);
• long tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 29);
• U.S. gallons per long ton at 60 °F in vacuo and in air (old Table 30);
• long tons per barrel at 60 °F in vacuo and in air (old Table 29);
• barrels per long ton at 60 °F in vacuo and in air (old Table 30);
• metric tons per 1000 U.S. gallons at 60 °F in vacuo and in air;
• metric tons per barrel at 60 °F in vacuo and in air;
• barrels per metric ton at 60 °F in vacuo and in air;
• cubic metres per short ton at 15 °C in vacuo and in air (old Table 31);
• cubic metres per long ton at 15 °C in vacuo and in air (old Table 31).

While not related to relative density, the following are included for user convenience:
• U.S. gallons at 60 °F to litres at 15 °C (old Table 22);
• barrels at 60 °F to litres at 15 °C (old Table 22, Table 52).

Chapter 11.5.3
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 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;
• cubic metres per short ton at 15 °C in vacuo and in air (old Table 14);
• cubic metres per long ton at 15 °C in vacuo and in air (old Table 14).

While not related to absolute density, the following are included for user convenience:
• litres at 15 °C to U.S. gallons at 60 °F;
• cubic metres at 15 °C to barrels at 60 °F.

Chapter 12
Calculation of Petroleum Quantities
Describes the standard procedures for calculating net standard volumes, including the application of correction factors and the importance of significant figures. The purpose of standardizing the calculation procedure is to achieve the same result regardless of which person or computer does the calculating.

Chapter 12.1.1
Calculation of Static Petroleum Quantities, Part 1—Upright Cylindrical Tanks and Marine Vessels
(includes Errata 1 dated May 2015)
Guides the user through the steps necessary to calculate static liquid quantities, at atmospheric conditions, in upright, cylindrical tanks and marine tank vessels. The standard defines terms employed in the calculation of static petroleum quantities. The standard also specifies equations that allow the values of some correction factors to be computed. Fundamental to this process is the understanding that in order for different parties to be able to reconcile volumes, they must start with the same basic information (tank capacity table, levels, temperatures, and so forth) regardless of whether the information is gathered automatically or manually. This standard does not address the calculation of clingage, nonliquid material, small quantities (such as onboard quantities, quantities remaining on board, and wedge formula, where material is not touching all bulkheads on marine vessels), and vapor space calculations.

A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM1 Part 1. Pages: 40
3rd Edition | April 2012 | Product Number: H1201013 | Price: $114.00
Chapter 12.1.1 *
Calculation of Static Petroleum Quantities, Part 1—Upright Cylindrical Tanks and Marine Vessels—Spanish
Spanish translation of Ch. 12.1.1.
3rd Edition | April 2012 | Product Number: H1201013SP | 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 LPGs and other liquefied gases) transported by rail tank car. It does not cover any products loaded or measured as solids. It defines the terms required to understand the calculations, and provides instructions for their use; includes 13 calculation examples in Appendix E. Pages: 39
1st Edition | May 2003 | Reaffirmed: May 2011
2-Year Extension: March 2016 | Product Number: H12121 | Price: $111.00

Chapter 12.1.2 *
Calculation of Static Petroleum Quantities, Part 2—Calculation Procedures for Tank Cars—Spanish
Spanish translation of Ch. 12.1.2.
1st Edition | May 2003 | Product Number: H12121S | Price: $111.00

Chapter 12.2.1
Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric 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, which is divided into five parts, each published separately. The base (reference or standard) volumetric determination of metered quantities is discussed along with the general terms required for solution of the various equations. General rules for rounding of numbers, including field data, intermediate calculations numbers, and discrimination levels, are specified. Pages: 23
Product Number: H12021 | Price: $109.00

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, calculational sequence, and discrimination levels to be employed in the calculations. Pages: 18
Product Number: H12223 | Price: $101.00

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 Volumetric 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 (BPV) of a displacement prover. Pages: 58
1st Edition | December 1997 | Reaffirmed: September 2014
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
Product Number: H12025 | Price: $170.00

Chapter 12.3
Calculation of Volumetric Shrinkage from Blending Light Hydrocarbons with Crude Oils
(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: $99.00

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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 1 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: H30321 | 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
Methods of Evaluating Meter Proving Data
(includes Errata 1 dated October 2015)
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. 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: 76
7th Edition | May 2016 | Product Number: H140107 | Price: $209.00

Chapter 14.2
Compressibility Factors of Natural Gas and Other Related Hydrocarbon Gases
(AGA Report No. 8) (GPA 8185-90)
Prepares 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.
2-Year Extension: October 2016
Order from American Gas Association, 400 N. Capitol Street NW, Washington, DC 20001 | 202-824-7000

Chapter 14.3.1
Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids—Concentric Square-Edged Orifice Meters, Part 1: General Equations and Uncertainty Guidelines
(includes Errata 1 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 (USC) and international system of units (SI) units 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

Chapter 14.3.2
Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids—Concentric, Square-Edged Orifice Meters, Part 2: Specification and Installation Requirements
(ANSI/API MPMS Ch. 14.3.2-2016) (AGA Report No. 3, 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: 74
5th Edition | March 2016 | Product Number: H1403025 | Price: $188.00

Chapter 14.3.3
Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids—Concentric, Square-Edged Orifice Meters, Part 3: Natural Gas Applications
(ANSI/API MPMS Ch. 14.3.3-2013) (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 Ch. 14.3, Parts 1 and 2, to the measurement of natural gas. Pages: 54

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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.
Chapter 14.3.4
Offshore Metering of Natural Gas and Other Related Hydrocarbon Fluids—Concentric, Square-Edged Orifice Meters, Part 4: Background, Development, Implementation Procedures and Subroutine Documentation

(AGA Report No. 3, Part 4) (GPA 8185, Part 4)

Describes the background and development of the equation for the coefficient of discharge of flange-tapped square-edged concentric orifice meters and recommends a flow rate calculation procedure. The recommended procedures provide consistent computational results for the quantification of fluid flow under defined conditions, regardless of the point of origin or destination, or the units of measure required by governmental customs or statute. The procedures allow different users with different computer languages on different computing hardware to arrive at almost identical results using the same standardized input data. Pages: 138

2-Year Extension: March 2016 | 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

2-Year Extension: October 2016 | 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

(GPA 2172-09)

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

Product Number: H140503 | Price: $73.00

Chapter 14.6
Continuous Density Measurement

(includes Errata 1 dated August 1998)

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

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 350 to 688 kg/m³ (0.350 to 0.689 relative density at 60 °F) density range. The mass measurement systems within the scope of this document include inferred mass measurement, where volume at flowing conditions is combined with density at similar conditions to result in measured mass, as well as Coriolis mass measurement. Liquids with density below 350 and above 688 kg/m³ (below 0.350 and above 0.689 relative density at 60 °F) and cryogenic fluids (colder than approximately –50 °F) are excluded from the scope of this document, but the principles described herein may apply to such streams. Sampling equipment and techniques are covered including standards for analytical methods used to determine the composition of the sampled product. Equations of state and correlations used to calculate the density of the product are discussed. The standard used to convert mass to equivalent liquid volumes of components is also discussed. Pages: 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

2-Year Extension: October 2016 | Product Number: H14082 | Price: $97.00

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:

- application considerations,
- selection criteria and other considerations for flare meters and related instrumentation,
- installation considerations,
- limitations of flare measurement technologies,
- calibration,
- operation,
- uncertainty and propagation of error,
- calculations.

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

1st Edition | July 2007 | Reaffirmed: June 2012
Product Number: H140101 | Price: $107.00
Chapter 15
Guidelines for the 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

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. Pages: 20

Product Number: H16021 | Price: $97.00

Chapter 17
Marine Measurement

Provides guidelines for the measurement and reporting of hydrocarbons including but not limited to crude oil or petroleum product for transfers by shore terminal operators, vessel personnel, and other parties involved in cargo transfer measurement and accountability operations.

Chapter 17.1
Guidelines for Marine Inspection

Specifies the policy and minimum recommended practices for the manual and automatic measurement, sampling, and accounting for bulk quantities of crude oil (including spiked, blended, and reconstituted crude oil), petroleum products and chemicals that are transported on marine vessels. The activities described in these guidelines include actions by producers, buyers, sellers, terminal operators, vessel owners, and their crews, customs authorities, independent inspectors, and other parties with an interest in measurements.

Certain vessel or terminal configurations and cargo characteristics, particularly chemicals, may require extensive procedures and calculation methods not covered in this chapter.

These procedures are equally valid and applicable for either metric or customary units of measurement, provided that the same types of units are used consistently.

The purchase of this document includes Excel® spreadsheets of the Sample Forms in Annex A (excluding “Voyage Analysis Report,” which is available in Ch. 17.5). The sample forms are designed to provide a guideline for recording and reporting essential data obtained during the marine cargo inspection procedure. Pages: 45

Product Number: H170106 | Price: $150.00

Chapter 17.2
Measurement of Cargoes On Board Tank Vessels

Includes Errata 1 dated April 2000

Covers 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 (OBQ/ROB), as well as taking the temperatures and samples required for the marine custody transfer of bulk liquid petroleum cargoes under closed or restricted system measurement conditions. This standard is not intended for use with pressurized or refrigerated cargoes such as LPG and LNG. Pages: 19

2nd Edition | May 1999 | Reaffirmed: September 2011
2-Year Extension: May 2016 | Product Number: H17022 | Price: $132.00

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 17.3
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: 29

2nd Edition | December 2016
Product Number: H170302 | Price: $120.00

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 prior to loading a vessel or material remaining on board a vessel upon 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. It does not address clingage, hydrocarbon vapors, cargoes in transit, or cargo pummability. Refer to Ch. 3. Pages: 25

2nd Edition | September 2016
Product Number: H170402 | Price: $110.00

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. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM64. Pages: 39

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

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Chapter 17.5 * Guidelines for Voyage Analysis and Reconciliation of Cargo Quantities—Spanish

Spanish translation of Ch. 17.5.

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

Describes procedures for determining or confirming the fill condition of pipeline systems used for the transfer of liquid cargoes before and/or after the liquid is loaded onto or discharged from marine vessels. It includes descriptions of methods and procedures that apply to crude oil and petroleum products. While this document includes descriptions of common line fill verification methods, it does not recommend any particular method. The responsibility for selecting a method appropriate for a given terminal, and documenting its effectiveness, rests with those responsible for operating the terminal where it is applied. Pages: 10

2nd Edition | June 2014 | Product Number: H170602 | Price: $110.00

Chapter 17.8 Guidelines for Pre-Loading Inspection of Marine Vessel Cargo Tanks and Their Cargo-Handling Systems

Specifies procedures for determining that the cargo tanks and associated cargo-handling system of marine vessels are in a suitably clean condition to receive the intended cargo. This applies to the loading of crude oil, petroleum products, and petrochemical cargoes. The extent of pre-loading inspection will vary depending on the nature of the cargo to be loaded. These guidelines recommend the extent of inspection that should be instituted for certain general types of cargoes and an example of a format that may be used for reporting the findings of tank inspections. Because of the wide variety of conditions that may exist when performing pre-loading tank inspections, this guideline is not intended to restrict the judgment of the person performing the inspection. Pages: 18

2nd Edition | August 2016 | Product Number: H170802 | Price: $108.00

Chapter 17.9 Vessel Experience Factor (VEF) (includes Addendum 1 dated January 2014)

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 VEF or VEF0 and to remove the possibility of any arbitrary inclusion or exclusion of data on the part of the individual(s) performing the final calculation. Also provides instruction for parcel tankers, part cargoes, compartmental VEFs, and vessel-to-vessel transfers. The methods are applicable to liquid bulk cargoes including crude oil, petroleum products, chemicals, and liquefied petroleum gases. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM49. Pages: 22

Product Number: H170902 | Price: $165.00

Chapter 17.9 * Vessel Experience Factor (VEF)—Spanish

Spanish translation of Ch. 17.9, including Addendum 1 dated January 2014.

2nd Edition | May 2012 | Product Number: H170902SP | Price: $165.00


(ANSI/API MPMS Ch. 17.10.1)

Establishes all of the steps needed to properly measure and account for the quantities of cargoes on liquefied natural gas (LNG) carriers. This includes, but is not limited to, the measurement of liquid volume, vapour volume, temperature and pressure, and accounting for the total quantity of the cargo on board. This document describes the use of common measurement systems used on board LNG carriers, the aim of which is to improve the general knowledge and processes in the measurement of LNG for all parties concerned. This document provides general requirements for those involved in the LNG trade on ships and onshore. Pages: 65

1st Edition | April 2014 | Product Number: HH171011 | Price: $150.00

Chapter 17.10.2 Measurement of Cargoes On Board Marine Gas Carriers, Part 2—Liquefied Petroleum and Chemical Gases

Provides guidance to vessel and shore personnel regarding accepted methods for determining quantities of liquefied petroleum and chemical gas cargoes (excluding LNG) on board refrigerated and/or pressurized carriers. This standard covers all measurement systems commonly used on refrigerated and/or pressurized gas carriers designed to carry those types of cargoes and includes recommended methods for measuring, sampling, documenting, and reporting quantities on board these vessels. Pages: 80

2nd Edition | March 2016 | Product Number: H171022 | Price: $150.00

Chapter 17.11 Measurement and Sampling of Cargoes On Board Tank Vessels Using Closed and 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. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM52. Pages: 19

2nd Edition | August 2016 | Product Number: H170112 | Price: $108.00

Chapter 17.12 Procedures for Bulk Liquid Chemical Cargo Inspections

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. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM51L. Pages: 66

2nd Edition | August 2015 | Product Number: H170122 | Price: $163.00

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

Product Number: H18012 | Price: $115.00

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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.
Chapter 18.2
Custody Transfer of Crude Oil from Lease Tanks Using Alternative Measurement Methods

Defines the minimum equipment and methods used to determine the quantity and quality of crude oil being loaded from a lease tank to a truck trailer or railcar without requiring direct access to a lease tank gauge hatch. Methods and equipment described are grouped by tank zone, trailer zone, and the transition zone between the two. The equipment used for measurement is dependent on the existing design of the lease equipment, the equipment used to transport the product, or a combination of the two. Some sites may require measurements from multiple zones in order to arrive at an accurate load quantity and quality.

This publication integrates by reference the API Manual of Petroleum Measurement Standards (MPMS) for sampling, temperature determination, gauging, and quality testing into a framework that may be applied during custody transfer of crude oil from lease tanks to a tank truck without requiring direct access to the tank thief gauge hatch. Many of the individual standards have guidelines defining the frequency and tolerances for installation, verification, and calibration of the specified equipment under controlled or ideal conditions allowing for uncertainty within custody transfer requirements. However, with the conditions encountered in many of today’s applications, the installation, verification, and calibration of measurement devices may have higher uncertainties due to the operational characteristics and limited access available at the lease site. In the interest of safety and environmental concerns, these higher uncertainties may still provide acceptable measurement for custody transfer of crude oil from tanks using the defined alternate methods.

The alternate measurement methods discussed in this standard are intended to minimize uncertainty and bias while encouraging consistent measurement and testing practices using existing technologies within API standards. Pages: 29

1st Edition | July 2016 | Product Number: H180201 | Price: $125.00

Chapter 19
Evaporation Loss Measurement

Covers methods for estimating hydrocarbon evaporation losses from various types of tanks.

NOTE Chapter 19 is not included in the complete set of measurement standards.

Chapter 19.1
Evaporative Loss from Fixed-Roof Tanks

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/in.²).

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 as follows.

- 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 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: 26

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

Chapter 19.1D

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

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.

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, or 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. stocks with a true vapor pressure greater than the atmospheric pressure at the tank location) or from petroleum liquids or petrochemicals for which the vapor pressure is not known or cannot readily be predicted.
- To estimate losses from storage tanks that do not have a floating roof.
- 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 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 as follows:

- 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 Speciation Methodology. This chapter has 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: 95

Chapter 19.3, Part C
Weight Loss Test Method for the Measurement of Rim-Seal Loss Factors for Internal Floating-Roof Tanks
Provides a uniform method for measuring evaporative loss from rim seals used on aboveground storage tanks. This information can be utilized to establish product specific loss factors in terms of loss rate and seal gap area. Pages: 29
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 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 results. 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
• liquid mixtures where Raoult's Law cannot be used to describe the vapor phase equilibria.
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 as follows:

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: 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, or
  • shallow draft barges; and
  • loading ballast water into ship or ocean barges from which crude oil has been unloaded.

The emission estimates are for uncontrolled loading operations and do not apply to operations using vapor balance or vapor control systems or ballasting of ships with segregated ballast tanks. This standard does not address evaporative loss for:
• very large crude carriers (VLCCs) or ultra large crude carriers (ULCCs) (unless the saturation factor KS is determined);
• marine vessels employing crude oil washing;
• marine vessel transit loss;
• loading ballast water into marine vessels that, prior to dockside unloading, held anything other than crude oil (unless the saturation factor KS is determined); or
• unloading marine vessels.

This standard supersedes Publ 2514A, 2nd Edition, September 1981, which is withdrawn. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM65. Pages: 31

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 adequately predicts emissions for tanks ranging in size from 17,000 to 35,000 dead weight tons and for tanks being loaded within the lower-48 states. The model does not appear to apply to crude oil loading of tankers in Valdez, Alaska, because of unique local operating conditions. However, no known test data invalidates the model for predicting crude oil loading emissions from carriers smaller than very large crude carriers in the 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 truck or suction pump, if such devices are used in the tank cleaning process.

In other words, this report addresses the estimation of the mass of volatile organic compounds that leave the tank as vapor during the tank cleaning process. It does not address emissions that may result from the handling of liquids or sludge after such materials have been removed from the tank. This report is intended to reduce the effort required to generate a good faith estimate of tank cleaning emissions, and to result in more uniformity in the resulting emissions estimates. Pages: 47


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 vapor processing unit, or otherwise restricted from being freely vented). Pages: 26

1st Edition | August 2008 | Product Number: H25690 | Price: $107.00
Chapter 20.3 Measurement of Multiphase Flow

This chapter 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 document establishes a framework to develop, implement, and manage the application of hydrocarbon phase behavior modeling in upstream measurement and allocation systems. The requirements and guidelines apply to the development, implementation, and performance management of a process simulation model (PSM) incorporating an equation of state (EOS) description of phase behavior. This includes functional specifications, validation, and maintenance of the PSM, EOS specification and implementation, and fluid compositional specification and validation.

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RP 87
Recommended Practice for Field Analysis of Crude Oil Samples Containing from Two to Fifty Percent by Volume

Provides the user with recommended "field" methods of sampling, sample handling, and analysis for high water content streams up to 50 % water on a volumetric basis. In particular, this RP was developed giving consideration to offshore installations (both floating and fixed platforms). These installations are generally subject to motion and vibrations, have minimal laboratory equipment, and perform S&W analysis with multi-skilled operations personnel as opposed to laboratory chemists. The techniques described, however, are applicable to onshore locations.

Provides design and operating guidelines for sampling, sample handling, and analysis for high water content streams, up to 50 % water on a volumetric basis. As a guide, this RP targets a relative accuracy of 5 % of reading up to a maximum of 50 % water content as a qualifier for various methods described herein. For example, the corresponding absolute accuracy for a 10 % water content stream is ±0.5 % and for 20 % water content is ±1.0 %. Pages: 19
1st Edition | August 2000 | Reaffirmed September 2012
Product Number: G08701 | Price: $90.00

Chapter 21
Flow Measurement Using Electronic Metering Systems

Describes standard practices and minimum specifications for electronic measurement systems used in the measurement and recording of flow parameters. This chapter covers natural gas fluid and petroleum and petroleum product custody transfer applications using industry-recognized primary measurement devices.

Chapter 21.1
(ANSI/API MPMS Ch. 21.1-2011) (AGA Report No. 3)

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 auditable 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

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

This addendum specifically covers inferred mass measurement systems utilizing flow computers as the tertiary flow calculation device and either turbine or displacement type meters, working with on-line density meters, as the primary measurement devices. The scope does not include systems using calculated flowing densities, i.e. Equations of State. The hardware is essentially identical to that referenced in API MPMS Ch. 21.2 and the methods and procedures are as described in API MPMS Ch. 14.4, 14.6, 14.7, and 14.8. Audit, record-keeping, collection and calculation interval, security, and most other requirements for systems covered in API MPMS Ch. 21.2 will apply to this addendum. As in Ch. 21.2, the hydrocarbon liquid streams covered in the scope must be single phase liquids at measurement conditions.
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
General Guidelines for Developing Testing Protocols for Devices Used in the Measurement of Hydrocarbon Fluids
(ANSI/API MPMS Ch. 22.1-2015)

Intended for the development of testing protocols and to serve as a guideline to document performance characteristics of hydrocarbon fluid measurement related devices. Pages: 7
2nd Edition | August 2015 | Product Number: H220102 | Price: $87.00

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 testing protocol are to:
- ensure that the user of any differential pressure flow meter knows the performance characteristics of the meter over a range of Reynolds numbers as applicable or defined by tests;
- facilitate both the understanding and the introduction of new technologies;
- provide a standardized vehicle for validating manufacturer's performance specifications;
- provide information about relative performance characteristics of the primary elements of the differential pressure metering devices under standardized testing protocol;
- quantify the uncertainty of these devices and define the operating and installation conditions for which the stated uncertainties apply. Pages: 29
Product Number: H220201 | Price: $87.00
Chapter 22.3
Testing Protocol for Flare Gas Metering
(ANSI/API MPMS Ch. 22.3-2015)
Describes a testing protocol for flare gas meters. This includes a
discussion of the testing to be performed, how the test data should be
analyzed, and how an uncertainty is determined from the testing of the
meter. The scope does not include the general guidelines to flare gas
metering that are covered under Ch. 14.10. Pages: 21
1st Edition | August 2015 | Product Number: H220301 | Price: $98.00

Chapter 22.6
Testing Protocol for Gas Chromatographs
A general gas chromatograph (GC) performance test protocol that
specifies the scope and reporting requirements of GC tests for
repeatability, reproducibility, and response linearity. The protocol specifies
requirements for tests over a range of gas compositions, tests over a range of
environmental conditions, and long-term performance tests. Pages: 50
1st Edition | August 2015 | Product Number: H220601 | Price: $98.00

Chapter 23
Reconciliation of Hydrocarbon Quantities
Provides practical methodologies for monitoring hydrocarbon
transportation loss and gain for non-marine systems i.e. pipeline, tank cars
(rail tank cars, tank trucks, etc.). For Marine Reconciliation, refer to
API MPMS Ch. 17.

Chapter 23.1
Reconciliation of Liquid Pipeline Quantities
(supersedes Std 2560)
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. This document does not
establish industry standards for loss/gain level because each system is
individual and exhibits its own loss/gain level and/or patterns under normal
operating conditions. The document provides operational and
statistically based tools for identifying when a system has deviated from
normal, the magnitude of the deviation, and guidelines for identifying the
causes of deviation from normal.
The primary application of this publication is in custody transfer liquid
pipeline systems in which there is provision for measuring all liquids that
enter the system and exit the system, as well as liquid inventory within the
system. The application is not intended for nonliquid or mixed-phase
systems. The applications and examples in this document are intended
primarily for custody transfer pipeline systems, but the principles may be
applied to any system that involves the measurement of liquids into and
out of the system and, possibly, inventory of liquids within the system.
Such systems may include pipelines, marine terminals, marine voyages,
bulk loading or storage terminals, tank farms, and rail and trucking
systems. Pages: 35
1st Edition | June 2016 | Product Number: H230101 | Price: $95.00

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 (DP), displacement,
  ultrasonic, Coriolis, vortex, turbine, thermal, and others;
• associated instrumentation for measuring fluid properties and flowing
  conditions, such as pressure and temperature transmitters,
  densitometers, 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 | May 2013 | 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, TR 2571, can be referenced for
guidance on monitoring 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

TR 2575
Measurement of Thermally Cracked Gas
Presents a method to compute the density, compressibility factor, and
supercompressibility factor for thermally cracked gas (TCG) for custody
transfer using orifice meters. It provides equations, parameters,
computation flow diagrams, and example spreadsheet calculations. This
technical report applies to TCG mixtures after treatment. It applies for
temperature from 90 °F to 120 °F (305 K to 322 K) at pressures up to
300 psig (2 MPa). It is limited to a specific operating region. The method
is for the single gas phase only. Pages: 17
1st Edition | September 2014 | Product Number: H257501 | Price: $65.00
fuels at pre-airfield storage terminals, located directly upstream of the standards and operating procedures for the receipt and storage of aviation recommended practice provides guidance on the minimum equipment the airport, hereafter referred to as “pre-airfield storage terminals.” This 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 provides 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 the 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 Aviation Fuelling Hose
- 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
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, above ground bulk storage systems, 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
Guide to procedures and equipment that should be used for the proper installation of underground storage systems for bulk petroleum products or used oil at retail and commercial facilities. The stored products include gasoline, diesel fuel, kerosene, lubricating oils, used oil, and certain bio-fuel blends. This RP is intended for use by architects, engineers, tank owners, tank operators, and contractors. Contractors, engineers, and owners or operators who are preparing to design or install an UST system should investigate the federal, state, and local requirements and current methods of compliance for vapor recovery in that region. Vapor recovery is covered in detail in Section 17 of this document. This RP is not intended to cover specialized installations, such as fuel storage systems at marinas or airports, heating oil storage systems (either residential or bulk), or systems installed inside buildings. However, it does outline recognized and generally accepted good engineering practices that may be of use for these specialized installations. This RP does not apply to the installation of below ground or above ground bulk storage systems greater than 60,000 gallons. Pages: 89

RP 1621
Bulk Liquid Stock Control at Retail Outlets
Primarily applies to underground storage of motor fuels and used oil at retail and commercial facilities. It 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 E0 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. Methods for vapor-freeing tanks, removing sediment, and cleaning interior surfaces of steel and fiberglass tanks are also presented, as are guidelines for identifying tanks that may be lined. The methods described in this standard are applicable to steel and fiberglass-reinforced plastic tanks used for the storage of petroleum-based motor fuels and middle distillates. The procedures are applicable to tanks installed in typical retail service station outlets, but may also be used for tanks installed at other types of facilities. Pages: 25
Product Number: A16315 | Price: $86.00

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 Std 1542. Pages: 15
Product Number: A16373 | Price: $66.00

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 qualified service technicians. Pages: 22
Product Number: A16391 | Price: $86.00

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. It 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. This RP also covers the minimum equipment standards and operating procedures for the receipt, storage, blending of light products, including but not limited to gasoline, kerosene, diesel, heating oil and their blend components (i.e. ethanol, biodiesel, and butane) at distribution and storage terminals, as well as light product shipments directly via a pipeline, marine vessel (barge or ship) or road and rail transport. In addition, this RP 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
Marketing

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**Publ 1642**
Alcohol, Ethers, and Gasoline-Alcohol and -Ether Blends
Examines fire safety considerations at petroleum marketing facilities. Focuses on gasoline blended with oxygenates, and MBS, 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

**Publ 1645**
Stage II Cost Study
Addresses the general installation cost information for three different types of retail gasoline outlet (RGO) vapor recovery systems: vapor balance, passive vacuum assist, and active vacuum assist. Additionally, it provides an overview of how each system operates. Pages: 6
1st Edition | August 2002 | Product Number: A16451 | Price: $57.00

**Std 2610**
Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities
Covers the design, construction, operation, inspection, and maintenance of petroleum terminal and tank facilities associated with marketing, refining, pipeline, and other similar activities. Covers site selection and spacing, pollution prevention and waste management, safe operations, fire prevention and protection, tanks, dikes and berms, mechanical systems (pipe, valves, pumps, and piping systems), product transfer, corrosion protection, structures, utilities and yard, and removals and decommissioning.

The purpose of this standard is to consolidate a wide base of current industry experience, knowledge, information, and management practices into a cohesive standard comprising a range of best practices. Pages: 53
2nd Edition | May 2005 | Reaffirmed: December 2010
2-Year Extension: May 2016 | Product Number: C26102 | Price: $122.00

**Std 2610 *
Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities—Spanish
Spanish translation of Std 2610.
2nd Edition | May 2005 | Product Number: C26102SP | Price: $121.00

**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-pilot piping. Off-pilot 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, transmix, slop water, and biofuels. This document does not address 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
1st Edition | February 1992 | Product Number: B20002 | Price: $59.00

**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</code><code>Study of Used Motor 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. VHS tape: 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 MC-306 tank vehicles at terminals operated by more than one supplier. Guides the manufacturer and operator of a tank vehicle as to the unique features that should be provided to permit loading of a tank vehicle with a standard 4-in. adapter. This edition of RP 1004 requires an independent secondary control system and maximum requirements for outage in the tank to allow the secondary control system to function. Pages: 21
Product Number: A10048 | Price: $111.00
RP 1007
Loading and Unloading of MC 306/DOT 406 Cargo Tank Motor Vehicles

Ensuring the safe and efficient loading and delivery of petroleum products to retail service stations and bulk facilities is the primary goal for all companies that transport product. This document is a guideline for use by the truck driver and persons responsible for loading and unloading of MC306/DOT406 cargo tanks. It identifies specific steps to ensure that product can be loaded into tank trucks and unloaded into both underground and aboveground storage tanks in a safe and efficient manner that protects the environment. It is intended to be used in conjunction with existing driver training programs and procedures.

Pages: 24

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RP 1112
Developing a Highway Emergency Response Plan for Incidents Involving Hazardous Materials

Provides minimum guidelines for developing an emergency response plan for incidents involving hazardous liquid hydrocarbons, such as gasoline and crude oil, transported in MC 306/DOT 406 and MC 307/DOT 407 aluminum cargo tanks, and for coordinating and cooperating with local, state, and federal officials. Covers response plan priorities, personnel training, special equipment, media relations, environmental relations, and post-response activities. The appendixes outline a highway emergency response plan and suggest a procedure for removing liquid hydrocarbons from overturned cargo tanks and righting the tank vehicles.

Pages: 21

Product Number: A11123 | Price: $76.00

MOTOR OILS AND LUBRICANTS

Motor Oil Shelf Cards ◆

This two-page laminated guide helps 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 202-682-8156.

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Packs of 50 for $130.00

Publ 1509 ◆
Engine Oil Licensing and Certification System
(includes Addendum 1 dated October 2014)

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 U.S. and Japanese automobile manufacturers, diesel engine manufacturers, the additive industry represented by the American Chemistry Council (ACC), and the U.S. petroleum industry represented by API. This program benefits consumers, the petroleum industry, and gasoline- and diesel-engine manufacturers.

Pages: 72

17th Edition | September 2012 | This document is available for free through the EOLCS/Publications portion of API's website, www.api.org.

Publ 1520 ◆
Directory of Licensees: API Engine Oil Licensing and Certification System

Identifies the companies licensed to display the API Engine Oil Licensing and Certification System (EOLCS) Symbols.

This directory can 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

Std 2350
Overfill Protection for Storage Tanks in Petroleum Facilities (ANSI/API Std 2350)

Applies to storage tanks associated with marketing, refining, pipeline, and terminals operations and with tanks containing Class I or Class II petroleum liquids and use is recommended for Class III petroleum liquids. This standard addresses overfill protection for petroleum storage tanks. It recognizes 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 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. The fourth edition continues to build on experience and new technology through the use of management systems. Since operations are the primary overfill prevention safeguard, new definitions and requirements are established for alarms. Risk reduction is also addressed by current and generally accepted industry practices.

The essential elements of this document are based on current industry safe operating practices and existing consensus standards. Federal, state, and local regulations or laws may contain additional requirements for tank overfill protection programs. For existing facilities, the results of a risk-based analysis of aboveground atmospheric petroleum storage tanks may indicate the need for more protection against overfilling. In such cases, some provisions from this standard may be suitable.

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 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.

Pages: 47

4th Edition | May 2012 | Product Number: K235004 | Price: $114.00
HEALTH, ENVIRONMENT, AND SAFETY: WASTE

Publ 1638 Waste Management Practices for Petroleum Marketing Facilities
Provides specific guidance for managing typical waste streams at petroleum marketing facilities. This publication covers petroleum marketing facilities ranging from retail fuel convenience stores to terminals and lube plants. Pages: 20
1st Edition | October 1994 | Product Number: A16381 | Price: $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

Publ 1669 Results of a Retail Gasoline Outlet and Commercial Parking Lot Storm Water Runoff Study
Presents the findings of a study to characterize storm water runoff from retail gasoline outlets and compares the results with runoff from commercial parking lots and published urban “background” values. Funded by the Western States Petroleum Association (WSPA) and the American Petroleum Institute (API), the results of this study indicate that fueling activities at normally operated and maintained retail gasoline outlets do not contribute additional significant concentrations of measured constituents in storm water runoff. Pages: 24
1st Edition | December 1994 | Product Number: A16691 | Price: $83.00

HEALTH, ENVIRONMENT, AND SAFETY: SOIL AND GROUNDWATER

Publ 1628 A Guide to the Assessment and Remediation of Underground Petroleum Releases
Provides an overview of proven technologies for the assessment and remediation of petroleum releases in soil and groundwater. Covers accidental releases arising from the production, transportation, refining, and marketing of liquid petroleum products or unrefined crude oil. Pages: 119
3rd Edition | July 1996 | Product Number: A16283 | Price: $164.00
Publ 1628 and its five companion publications (1628A, 1628B, 1628C, 1628D, and 1628E) may be purchased as a set.
Order Number: A1628S | Price: $323.00

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

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Publ 1628C Optimization of Hydrocarbon Recovery
Covers the optimization, in its broadest sense, to achieve an environmentally sound site closure in the appropriate timeframe 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
Addresses 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: 13
1st Edition | July 1996 | Product Number: A1628E | Price: $59.00

Security

API Standard for Third Party Network Connectivity
Provides guidance for implementing secure third-party connections between the information technology systems and a network of two companies that have a business relationship and a common objective. The standard provides suggestions for companies to follow 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

This publication is a new entry in this catalog. ◆ This publication is related to an API licensing, certification, or accreditation program.
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: OSV02 | Price: $191.00

Std 1164
Pipeline SCADA Security

Provides guidance to the operators of oil and gas liquids pipeline systems for managing SCADA system integrity and security. The use of this document is not limited to pipelines regulated under Title 49 CFR 195.1, but should be viewed as a listing of best practices to be employed when reviewing and developing standards for a SCADA system. This document embodies API's Security Guidelines for the Petroleum Industry. This guideline is designed to provide operators with a description of industry practices in SCADA security, and to provide the framework needed to develop sound security practices within the operator's individual companies. It is important that operators understand system vulnerability and risks when reviewing the SCADA system for possible system improvements. The goal of an operator is to control the pipeline such 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's main body provides a high-level view of holistic security practices. The annexes provide further details and technical guidance. Reviewing 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 a continuous process. The overall process could take years to implement, 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 an element of the new system. Pages: 64

2nd Edition | June 2009 | Reaffirmed; October 2016
2-Year Extension: September 2014
Product Number: D11642 | Price: $146.00
**RAIL TRANSPORTATION**

**RP 3000**  
Classifying and Loading of Crude Oil into Rail Tank Cars  
Provides guidance on the material characterization, transport classification, and quantity measurement for overfill prevention of petroleum crude oil, for the loading of rail tank cars. 
This document applies only to petroleum crude oil classified as Hazard Class 3—Flammable Liquid under the U.S. Code of Federal Regulations (CFR) at the time of publication. 
RP 3000 identifies criteria for determining the frequency of sampling and testing of petroleum crude oil for transport classification. It discusses how to establish a sampling and testing program and provides an example of such a program. 
This document provides guidance on Packing Group (PG) assignment, including the potential effect of heel, and mixing of crude oils of differing PGs. The document provides guidance on initial testing and an ongoing sampling and testing for assignment of PG. 
RP 3000 provides guidance on determining the loading target quantity (LTQ) of crude oil transported by rail tank car. This includes crude oil temperature and density determination, identification of sampling points based on loading scenarios, and measurement equipment and processes. 
Guidance on the documentation of measurement results and record retention is also provided. Pages: 38 
1st Edition | September 2014 | Product Number: A30001 | Price: $125.00

**PIPELINE OPERATIONS PUBLICATIONS**

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**Guidelines for Property Development Brochure**  
The liquid petroleum pipeline industry has developed these guidelines to improve understanding and increase awareness of the nature of underground pipelines that transport oil, petroleum products, natural gas liquids, and other hazardous liquids and how to conduct land development and use activity near pipeline rights-of-way. The guidelines are intended for use by anyone who is involved in land development, agriculture, and excavation/construction activities near a pipeline. The industry’s goal is to protect public safety of the people who live and work along pipelines, protect the environment along rights-of-way, and maintain the integrity of the pipeline so that petroleum products can be delivered to customers safely and without interruption. 
A pipeline right-of-way (ROW) is property in which a pipeline company and a landowner both have a legal interest. Each has a right to be there, although each has a different type of use for the land. Pipeline companies are granted permission from private landowners to transport petroleum products across their private lands. That permission is documented in a written agreement called an easement, and it is obtained through purchase, license, or by agreement with the landowner. In cases where the land is owned by the government—whether local, state, or federal—similar arrangements for easements and their respective responsibilities for maintaining the safety of this vital, but invisible, transportation system. 
November 2009 | Product Number: DGP04 
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)

**Steel Pipelines Crossing Railroads and Highways**  
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. 
The provisions herein should be applicable to the construction of pipelines crossing under railroads and highways and to the adjustment of existing pipelines across railroad or highway. 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

**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, 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

**Welding of Pipelines and Related Facilities—Kazakh**  
Kazakh translation of Std 1104. 
21st Edition | September 2013 | Product Number: D110421K | Price: $276.00

* 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.
Transportation

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Std 1104 *
Welding of Pipelines and Related Facilities—Portuguese
Portland translation of Std 1104.
21st Edition | September 2013
Product Number: D110421P | Price: $345.00

Std 1104 *
Welding of Pipelines and Related Facilities—Russian
Russian translation of Std 1104.
21st Edition | September 2013
Product Number: D110421R | Price: $276.00

Std 1104 *
Welding of Pipelines and Related Facilities—Spanish
Spanish translation of Std 1104.
21st Edition | September 2013
Product Number: D110421SP | Price: $345.00

RP 1109
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 offshore facilities. Markers and signs indicate the presence of a pipeline 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 cover the minimum marker and sign requirements for liquid petroleum pipeline facilities. Alternative markers, which are recommended for some locations under certain circumstances, are also discussed. The pipeline operator is responsible for determining the extent of pipeline marking. Consideration should be given to the consequences of pipeline failure or damage; hazardous characteristics of the commodity being transported; and the pipeline’s proximity to industrial, commercial, residential, and environmentally sensitive areas. The pipeline marking programs are also integral parts of the pipeline operator’s maintenance and emergency plans.

This recommended practice 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
Product Number: D11094 | Price: $89.00

RP 1110
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 RP does not apply to pumping units, compressor units, breakout tanks, pressure 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 recommended practice (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 in this document. 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 document 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 1111
Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines (Limit State Design)
Sets criteria for the design, construction, testing, operation, and maintenance of offshore steel pipelines used in the production, production support, or transportation of hydrocarbons from the outlet flange of a production facility. The criteria applies to transportation piping facilities located on production platforms after separation and treatment, including meter facilities, gas compression facilities, liquid pumps, and associated piping and appurtenances. This document may also be used for water injection pipelines offshore.

Limit state design has been incorporated into the document to provide a uniform factor of safety with respect to rupture or burst failure as the primary design condition independent of the pipe diameter, wall thickness, and grade. The criteria contained in this document are intended to permit the economical transportation of hydrocarbons while providing for the safety of life and property and the protection of the environment. The general adoption of these criteria should assure that offshore hydrocarbon pipelines possess the requisite structural integrity for their safe and efficient operation.

Pages: 67
5th Edition | September 2015 | Product Number: D11115 | Price: $140.00

RP 1113
Developing a Pipeline Supervisory Control Center
(supersedes the 3rd Edition of Publ 1113)
Focuses on the design aspects that may be considered appropriate for developing or revamping a control center. A pipeline supervisory control center is a facility where the function of centralized monitoring and controlling of a pipeline system occurs. This document is not all-inclusive. It is intended to cover best practices and provide guidelines for developing a control center only. It does not dictate operational control philosophy or overall SCADA system functionality. This document is intended to apply to control centers for liquids pipelines; however, many of the considerations may also apply to gas control center design.

Pages: 10
1st Edition | August 2007 | Reaffirmed: June 2012
Product Number: D11131 | Price: $85.00

RP 1114
Recommended Practice for the Design of Solution-Mined Underground Storage Facilities
Provides basic guidance on the design and development of new solution-mined underground storage facilities. It is based on the accumulated knowledge and experience of geologists, engineers, and other personnel in the petroleum industry. Users of this guide are reminded that no publication of this type can be complete nor can any written document be substituted for qualified, site-specific engineering analysis. All aspects of solution-mined underground storage are covered, including selecting an appropriate site, physically developing the cavern, and testing and commissioning the cavern. Additionally, a section on plug and abandonment practices is included. This recommended practice does not apply to caverns used for waste disposal purposes.

Pages: 47
2nd Edition | January 2013 | Product Number: D11142 | Price: $90.00

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RP 1115
Recommended Practice on the Operation of Solution-Mined Underground Storage Facilities

Provides basic guidance on the operation of solution-mined underground hydrocarbon liquid or liquefied petroleum gas storage facilities. This document is intended for first-time cavern engineers or supervisors, but would also be valuable to those people experienced in cavern operations. This recommended practice is based on the accumulated knowledge and experience of geologists, engineers, and other personnel in the petroleum industry. All aspects of solution-mined underground storage operation, including cavern hydraulics, brine facilities, wellhead and hanging strings, and cavern testing are covered. Users of this guide are reminded that no publication of this type can be complete, nor can any written document be substituted for effective site-specific operating procedures.

This recommended practice does not apply to caverns used for natural gas storage, waste disposal purposes, caverns which are mechanically mined, depleted petroleum reserve cavities, or other underground storage systems which are not solution-mined. Pages: 16

Product Number: D11151 | Price: $86.00

RP 1117
Recommended Practice for Movement in In-Service Pipelines

Covers the design, execution, inspection, and safety of a pipeline-lowering or other movement operation conducted while the pipeline is in service. (In this document, the terms lowering and movement can be used interchangeably.) This recommended practice presents general guidelines for conducting a pipeline-movement operation without taking the pipeline out of service. It also presents equations for estimating the induced stresses. To promote the safety of the movement operation, it describes stress limits and procedures. Additionally, it outlines recommendations to protect the pipeline against damage. The practicability and safety of trench types, support systems, and lowering or other methods are considered. Inspection procedures and limitations are presented. Pages: 33

Product Number: D11173 | Price: $132.00

RP 1130
Computational Pipeline Monitoring for Liquids

Focuses on the design, implementation, testing, and operation of CPM systems that use an algorithmic approach to detect hydraulic anomalies in pipeline operating parameters. The primary purpose of these systems is to provide tools that assist pipeline controllers in detecting commodity releases that are within the sensitivity of the algorithm. It is intended that the CPM system would provide an alarm and display other related data to the pipeline controllers to aid in decision-making. The pipeline controllers would undertake an immediate investigation, confirm the reason for the alarm and initiate an operational response to the hydraulic anomaly when it represents an irregular operating condition or abnormal operating condition or a commodity release. The purpose of this recommended practice is to assist the pipeline operator in identifying issues relevant to the selection, implementation, testing, and operation of a CPM system. Pages: 42

1st Edition | September 2007 | Reaffirmed: April 2012
Product Number: D011301 | Price: $112.00

RP 1133
Guidelines for Onshore Hydrocarbon Pipelines Affecting High Consequence Floodplains

Sets out criteria for the design, construction, operation, maintenance, and abandonment of onshore pipelines that could affect high consequence floodplains and associated commercially navigable waterways. This document applies only to steel pipelines that transport gas, hazardous liquids, alcohols, or carbon dioxide.

The design, construction, inspection, and testing provisions of this document should not apply to pipelines that were designed or installed prior to the latest revision of this publication. The operation and maintenance provisions of this document should apply to existing facilities. The contents in this document should not be considered a fixed rule for application without regard to sound engineering judgment. Pages: 9

Product Number: D11331 | Price: $82.00

TR 1149
Pipeline Variable Uncertainties and Their Effects on Leak Detectability

Describes procedures for predicting uncertainties in the detection of leaks in pipelines using computational methods based upon physical hydraulic state measurements. This class of pipeline leak detection methods is commonly called Computational Pipeline Monitoring (CPM). Pages: 160

2nd Edition | September 2015 | Product Number: D11492 | Price: $165.00

Std 1160
Managing System Integrity for Hazardous Liquid Pipelines

Outlines a process that an operator of a pipeline system can use to assess risks and make decisions about risks in operating a hazardous liquid pipeline in order to reduce both the number of incidents and the adverse effects of errors and incidents.

An integrity management program provides a means to improve the safety of pipeline systems and to allocate operator resources effectively to: identify and analyze actual and potential precursor events that can result in pipeline incidents; examine the likelihood and potential severity of pipeline incidents; provide a comprehensive and integrated means for examining and comparing the spectrum of risks and risk reduction activities available; provide a structured, easily communicated means for selecting and implementing risk reduction activities; and establish and track system performance with the goal of improving that performance.

This standard is intended for use by individuals and teams charged with planning, implementing, and improving a pipeline integrity management program. Typically a team would include engineers, operating personnel, and technicians or specialists with specific experience or expertise (corrosion, inline inspection, right-of-way patrolling, etc.). Users of this standard should be familiar with the pipeline safety regulations (Title 49 CFR Part 195), including the requirements for pipeline operators to have a written pipeline integrity program and to conduct a baseline assessment and periodic reassessments of pipeline management integrity. Pages: 99

2nd Edition | September 2013 | Product Number: D116002 | Price: $215.00

RP 1161
Recommended Practice for Pipeline Operator Qualification (OQ)

Provides guidance to the liquids pipeline industry. The United States Department of Transportation (DOT) requires that pipeline operators develop a written qualification program to evaluate personnel and contractor ability to perform covered tasks and to recognize and respond to abnormal operating conditions that may be encountered while performing these covered tasks. This is a performance-based qualification program. Pages: 256

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 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's 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.

This RP provides the operator with 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
Product Number: D11622 | Price: $124.00

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 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 designed to provide operators with a description of industry practices in SCADA security, and to provide the framework needed to develop sound security practices within the operator's individual companies. It is important that operators understand system vulnerability and risks when reviewing the SCADA system for possible system improvements. The goal of an operator is to control the pipeline such 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's main body provides a high-level view of holistic security practices. The annexes provide further details and technical guidance. Reviewing 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 a continuous process. The overall process could take years to implement, 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 an element of the new system.

Pages: 64
2-Year Extension: September 2014
Product Number: D11642 | Price: $146.00

RP 1165
Recommended Practice for Pipeline SCADA Displays
Focuses on the design and implementation of displays used for the display, monitoring, and control of information on pipeline Supervisory Control and Data Acquisition Systems (SCADA). The primary purpose is to document industry practices that provide guidance to a pipeline company or operator who want to select a new SCADA system, or update or expand an existing SCADA system.

This document assists pipeline companies and SCADA system developers in identifying items that are considered best practices when developing human machine interfaces (HMI). Design elements that are discussed include, but are not limited to, hardware, navigation, colors, fonts, symbols, data entry, and control/selection techniques.

Pages: 45
Product Number: D11651 | Price: $152.00

TR 1166
Excavation Monitoring and Observation for Damage Prevention
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: 16
2nd Edition | October 2015 | Product Number: D11662 | Price: $106.00

RP 1167
Pipeline SCADA Alarm Management
Provides pipeline operators with recommended industry practices in the development, implementation, and maintenance of a SCADA alarm management program. It provides guidance on elements that include, but are not limited to, alarm definition, philosophy, documentation, management of change, and auditing. This document is 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. This document is intended to outline key elements for review when building an alarm management system. SCADA systems used within the pipeline industry vary in their alarm-related capabilities, and there are many different software systems available to aid in alarm management. It is the responsibility of the pipeline operator to determine the best method to achieve their alarm management goals.

This document uses industry best practices to help to illustrate aspects of alarm management. The scope is intended to be broad.

Pages: 39
2nd Edition | June 2016 | Product Number: D116702 | Price: $125.00
RP 1168
Pipeline Control Room Management
Provides pipeline operators and controllers with guidance on control room management best practices to consider when developing or enhancing practices and procedures. This document was written for operators with continuous and non-continuous operations, as applicable. This document addresses four pipeline safety elements for hazardous liquid and natural gas pipelines in both the transportation and distribution sectors: pipeline control room personnel roles, authorities, and responsibilities; guidelines for shift turnover; pipeline control room fatigue management; and pipeline control room management of change. Pages: 19
2nd Edition | February 2015 | Product Number: D11682 | Price: $90.00

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 1170
Design and Operation of Solution-Mined Salt Caverns Used for Natural Gas Storage
Provides functional recommendations for salt cavern facilities used for natural gas storage service and covers facility geomechanical assessments, cavern well design and drilling, and solution mining techniques and operations, including monitoring and maintenance practices. The recommended practice is based on the accumulated knowledge and experience of geologists, engineers, and other personnel in the petroleum and gas storage industries and promotes public safety by providing a comprehensive set of design guidelines. The recommended practice recognizes the nature of subsurface geological diversity and stresses the need for in-depth, site-specific geomechanical assessments with a goal of long-term facility integrity and safety. This recommended practice includes the cavern well system (wellhead, wellbore, and cavern) from the emergency shutdown valve down to the cavern and facilities having significant impact to safety and integrity of the cavern system.
This recommended practice does not apply to caverns used for the storage of liquid or liquefied petroleum products, brine production, or waste disposal; nor to caverns that are mechanically mined, or depleted hydrocarbon or aquifer underground gas storage systems. Pages: 87
1st Edition | July 2015 | Product Number: D117001 | Price: $120.00

RP 1171
Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs
Applies to natural gas storage in depleted oil and gas reservoirs and aquifer reservoirs, and focuses on storage well, reservoir, and fluid management for functional integrity in design, construction, operation, monitoring, maintenance, and documentation practices. Storage design, construction, operation, and maintenance include activities in risk management, site security, safety, emergency preparedness, and procedural documentation and training to embed human and organizational competence in the management of storage facilities. This recommended practice (RP) embodies historical knowledge and experience and emphasizes the need for case-by-case and site-specific conditional assessments. This RP applies to both existing and newly constructed facilities. Applicable distinctions for aquifer facilities are identified, as necessary. “Replacement,” as used in this document, refers to the complete replacement of a facility unit, as, for example, when an existing well is abandoned and replaced with a new well. This document recommends that operators manage integrity through monitoring, maintenance, and remediation practices and apply specific integrity assessments on a case-by-case basis.
The scope does not include pipelines, gas conditioning and liquid handling, compressors, and ancillary facilities associated with storage. Pages: 52
1st Edition | September 2015 | Product Number: D117101 | Price: $120.00

RP 1172
Recommended Practice for Construction Parallel to Existing Underground Transmission Pipelines
Emphasis of these guidelines is on the interaction between existing transmission pipeline operators and those planning to construct in a parallel fashion. These activities may involve many different parties. Contractors working on behalf of the constructing party, including environmental and survey professionals, design engineers, construction contractors, and operators of excavation and earth moving equipment, should engage in work practices that are in conformance with these guidelines and apply vigilance in identifying unanticipated circumstances that may indicate a problem. This RP refers to all of these entities as the “constructing party.” These guidelines have been developed such that they can be incorporated into contract documents executed with contractors and subcontractors by whichever party is involved in or responsible for construction activities. Pages: 19
1st Edition | April 2014 | Product Number: D11721 | Price: $85.00

RP 1173
Pipeline Safety Management Systems (ANSI/API RP 1173)
Establishes a pipeline safety management systems (PSMS) framework for organizations that operate hazardous liquids and gas pipelines jurisdictional to the U.S. Department of Transportation. Operators of other pipelines may find this document applicable useful in operating to their systems. This recommended practice (RP) provides pipeline operators with safety management system requirements that when applied provide a framework to reveal and manage risk, promote a learning environment, and continuously improve pipeline safety and integrity. At the foundation of a PSMS is the operator's existing pipeline safety system, including the operator's pipeline safety processes and procedures. This RP provides a comprehensive framework and defines the elements needed to identify and address safety for a pipeline's life cycle. These safety management system requirements identify what is to be done, and leaves the details associated with implementation and maintenance of the requirements to the individual pipeline operators. The document does not explicitly address personnel safety, environmental protection, and security, but the elements herein can be applied to those aspects of an operation. Pages: 27
1st Edition | July 2015 | Product Number: D117301 | Price: $85.00
RP 1174
Recommended Practice for Onshore Hazardous Liquid Pipeline Emergency Preparedness and Response

Provides operators of onshore hazardous liquid pipelines a framework that promotes the continual improvement of emergency planning and response processes, including identification and mitigation of associated risks and implementation of changes from lessons learned. This recommended practice (RP) assists the operator in preparing for a safe, timely, and effective response to a pipeline emergency.

This RP applies to assets under the jurisdiction of the U.S. Department of Transportation (DOT), specifically U.S. Title 49 Code of Federal Regulations (CFR) Parts 191 and 195. Operators of non-DOT jurisdictional pipelines or tank assets may also make voluntary use of this document. Pages: 48

1st Edition | December 2015 | Product Number: D11741 | Price: $93.00

RP 1175
Pipeline Leak Detection—Program Management

Establishes a framework for Leak Detection Program (LDP) management for hazardous liquid pipelines that are jurisdictional to the U.S. Department of Transportation (specifically, 49 CFR Part 195).

This recommended practice (RP) is specifically designed to provide pipeline operators with a description of industry practices in risk-based pipeline LDP management and to provide the framework to develop sound program management practices within a pipeline operator’s individual companies. It is important that pipeline operators understand system vulnerabilities, risks, and program management best practices when reviewing a pipeline LDP management process either for a new program or for possible system improvements.

This RP focuses on using a risk-based approach to each pipeline operator’s LDP and following the guidance set forth assists in creating an inherently risk mitigating LDP management system. The overall goal of the LDP is to detect leaks quickly and with certainty, thus facilitating quicker shutdown and therefore minimizing negative consequences. This RP focuses on management of LDPs, not the design of leak detection systems (LDDS).

Pages: 94

1st Edition | December 2015 | Product Number: D11751 | Price: $160.00

RP 1176
Recommended Practice for Assessment and Management of Cracking in Pipelines

Applies to any pipeline system used to transport hazardous liquid or natural gas, including those defined in U.S. Title 49 Code of Federal Regulations (CFR) Parts 192 and 195. This RP is designed to provide the operator with a description of industry-proven practices in the integrity management of cracks and threats that give rise to cracking mechanisms. The guidance is largely targeted to the line pipe along the right-of-way (ROW), but some of the processes and approaches can be applied to pipeline facilities, including pipeline stations, terminals, and delivery facilities associated with pipeline systems. Defects associated with lap-welded (LW) pipe and selective seam weld corrosion (SSWC) are not covered within this RP.

This RP presents the pipeline industry’s understanding of pipeline cracking, mechanisms that cause cracking are discussed, methods to estimate the failure pressure of cracks are reviewed, and methods to estimate crack growth are presented. Selection of the appropriate integrity assessment method for various types of cracking, operating conditions, and pipeline characteristics is discussed. This RP also reviews current knowledge about in-line inspection (ILI) technology and in-the-ditch (ITD) nondestructive evaluation technology. A methodology for responding to ILI indications and specific criteria for when to respond to certain results is presented.

Applicable repair techniques are reviewed, Sections are included for the discussion of reassessment interval determination and the consideration of appropriate preventive and mitigative measures. Some performance metrics for measuring the effectiveness of a crack management program are discussed. The technical discussion about crack formation, growth, and failure is to provide the knowledge needed by operators to effectively make integrity decisions about managing cracking on their pipeline systems.

Pages: 133

21st Edition | July 2016 | Product Number: D117601 | Price: $168.00

RP 2200
Repairing Hazardous Liquid Pipelines

Discusses 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 approaches, the observance of the suggestions in this document should improve the probability that repairs will be completed without accidents or injuries. Pages: 12

5th Edition | September 2015 | Product Number: D22005 | Price: $75.00

PIPELINE MAINTENANCE WELDING

Investigation and Prediction of Cooling Rates During Pipeline Maintenance Welding, and User’s Manual for Battelle’s Hot-Tap Thermal-Analysis Models

Investigated and improved the methods of predicting cooling rates during pipeline maintenance welding. The scope of this study included:

• a review of three previous research efforts to develop satisfactory methods for welding appurtenances to in-service pipelines;

• a survey of pipeline leak and rupture incidents associated with appurtenances;

• the enhancement of existing analytical models for predicting cooling rates and temperatures during welding on an in-service pipeline; and

• a validation of the thermal-analysis models that was achieved by performing welds on pipeline carrying three different liquid-petroleum products.

May 2002 | Product Number: | Version 4.2 | May 2002
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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, 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

Std 1104 *
Welding of Pipelines and Related Facilities—Kazakh

Kazakh translation of Std 1104.

21st Edition | September 2013
Product Number: D110421K | Price: $276.00
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Std 1104 *
Welding of Pipelines and Related Facilities—Portuguese
Portuguese translation of Std 1104.
21st Edition | September 2013
Product Number: D110421P | Price: $345.00

Std 1104 *
Welding of Pipelines and Related Facilities—Russian
Russian translation of Std 1104.
21st Edition | September 2013
Product Number: D110421R | Price: $276.00

Std 1104 *
Welding of Pipelines and Related Facilities—Spanish
Spanish translation of Std 1104.
21st Edition | September 2013
Product Number: D110421SP | Price: $345.00

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. VHS tape: 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 MC-306 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 of RP 1004 requires an independent secondary control system and maximum requirements for outage in the tank to allow the secondary control system to function. Pages: 21
Product Number: A10048 | Price: $111.00

RP 1007
Loading and Unloading of MC 306/DOT 406 Cargo Tank Motor Vehicles
Ensuring the safe and efficient loading and delivery of petroleum products to retail service stations and bulk facilities is the primary goal for all companies that transport product. This document is a guideline for use by the truck driver and persons responsible for loading and unloading of MC306/DOT406 cargo tanks. It identifies specific steps to ensure that product can be loaded into tank trucks and unloaded into both underground and aboveground storage tanks in a safe and efficient manner that protects the environment. It is intended to be used in conjunction with existing driver training programs and procedures. Pages: 24
Product Number: A10071 | Price: $39.00

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RP 1112
Developing a Highway Emergency Response Plan for Incidents Involving Hazardous Materials
Provides minimum guidelines for developing an emergency response plan for incidents involving hazardous liquid hydrocarbons, such as gasoline and crude oil, transported in MC 306/DOT 406 and MC 307/DOT 407 aluminum cargo tanks, and for coordinating and cooperating with local, state, and federal officials. Covers response plan priorities, personnel training, special equipment, media relations, environmental relations, and post-response activities. The 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

SECURITY

API Standard for Third Party Network Connectivity
Provides guidance for implementing secure third-party connections between the information technology systems and a network of two companies that have a business relationship and a common objective. The standard provides suggestions for companies to follow 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

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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

Std 780
Security Risk Assessment Methodology for the Petroleum and Petrochemical Industries

Prepared by a Security Risk Assessment (SRA) Committee of the American Petroleum Institute (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 781
Facility Security Plan Methodology for the Oil and Natural Gas Industries

Provides the framework to establish a secure workplace. The plan provides an overview of the threats facing the facility and describes the security measures and procedures designed to mitigate risk and protect people, assets, operations, and company reputation. This API standard was prepared with guidance and direction from the API Security Committee, to assist the petroleum and petrochemical industries in the preparation of a Facility Security Plan (FSP). This standard specifies the requirements for preparing an FSP as well as a discussion of the typical elements included in an FSP. This standard is intended to be flexible and adaptable to the needs of the user. It is noted that the content of an FSP can vary depending on circumstances such as facility size, location, and operations. This methodology is one approach for preparing an FSP at petroleum and petrochemical facilities. There are other security plan formats available for the industry. It is the responsibility of the user to choose the format and content of the FSP that best meets the needs of a specific facility. The format and content of some FSPs should be dictated by government regulations for covered facilities. This standard is not intended to supersedes the requirements of any regulated facility but may be used as a reference document. Pages: 82

1st Edition | September 2016 | Product Number: K78101 | Price: $145.00
If you have any questions or comments regarding API standards, please visit www.api.org/standards.

NOTE Free publications with an asterisk are subject to a $10.00 handling charge for each total order, plus actual shipping charges.

**INSPECTION OF REFINERY EQUIPMENT**

**API 510**

Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration

Covers the in-service inspection, repair, alteration, and rerating activities for pressure vessels and the pressure-relieving devices protecting these vessels. This inspection code applies to most refining and chemical process vessels that have been placed in service. This includes:

- vessels constructed in accordance with an applicable construction code;
- vessels constructed without a construction code (non-code)—a vessel not fabricated to a recognized construction code and meeting no known recognized standard;
- vessels constructed and approved as jurisdictional special based upon jurisdiction acceptance of particular design, fabrication, inspection, testing, and installation;
- non-standard vessels—a vessel fabricated to a recognized construction code but has lost its nameplate or stamping. Pages: 71

10th Edition | May 2014 | Product Number: C51010 | Price: $225.00

**API 510 ***

Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration—Chinese

Chinese translation of API 510. 10th Edition | May 2014 | Product Number: C51010C | Price: $158.00

**API 510 **

Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration—Spanish

Spanish translation of API 510. 10th Edition | May 2014 | Product Number: C51010S | Price: $225.00

**API 570 **

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

Covers inspection, testing, repair, and alteration procedures for metallic and fiberglass reinforced plastic (FRP) piping systems and their associated pressure relieving devices that have been placed in service. This inspection code applies to all hydrocarbon and chemical process piping covered in 1.2.1 that have been placed in service unless specifically designated as optional per 1.2.2. This publication does not cover inspection of specialty equipment including instrumentation, exchanger tubes, and control valves. However, this piping code could be used by owner/users in other industries and other services at their discretion. Process piping systems that have been retired from service and abandoned in place are no longer covered by this “in-service inspection” Code. However abandoned in place piping may still need some amount of inspection and/or risk mitigation to assure that it does not become a process safety hazard because of continuing deterioration. Process piping systems that are temporarily out of service but have been mothballed (preserved for potential future use) are still covered by this Code. Pages: 88


**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 (API 579-1/ASME FFS-1) 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. This RP 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

Product Number: C57102 | Price: $329.00

**RP 572**

Inspection Practices for Pressure Vessels

Supplements API 510 by providing pressure vessel inspectors with information that can improve skills and increase basic knowledge of inspection practices. This recommended practice (RP) describes inspection practices for the various types of pressure vessels (e.g. drums, heat exchangers, columns, reactors, air coolers, spheres) used in petroleum refineries and chemical plants. This RP addresses vessel components, inspection planning processes, inspection intervals, methods of inspection and assessment, methods of repair, records, and reports. API 510 has requirements and expectations for inspection of pressure vessels. Pages: 154


**RP 573**

Inspection of Fired Boilers and Heaters

Covers the inspection practices for fired boilers and process heaters (furnaces) used in petroleum refineries and petrochemical plants. The practices described in this document are focused to improve equipment reliability and plant safety by describing the operating variables which impact reliability and to ensure that inspection practices obtain the appropriate data, both on-stream and off-stream, to assess current and future performance of the equipment. Pages: 109

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

**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 of inspection practices. This recommended practice 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 inspectors in fulfilling their role implementing API 570. This publication does not cover inspection of specialty items, including instrumentation, furnace tubulars, and control valves. Pages: 113


* 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 supersed 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.
RP 575 ◆
Inspection Practices for Atmospheric and Low-Pressure Storage Tanks
Covers the inspection of atmospheric and low-pressure storage tanks that have been designed to operate at pressures from atmospheric to 15 psig. Includes reasons for inspection, frequency and methods of inspection, methods of repair, and preparation of records and reports. This recommended practice is intended to supplement Std 653, which covers the minimum requirements for maintaining the integrity of storage tanks after they have been placed in service. Pages: 96
3rd Edition | April 2014 | Product Number: C57503 | Price: $190.00

RP 575 *
Inspection Practices for Atmospheric and Low-Pressure Storage Tanks—Chinese
Chinese translation of RP 575.
3rd Edition | April 2014 | Product Number: C57503C | Price: $133.00

RP 576 ◆
Inspection of Pressure-Relieving Devices
Describes the inspection and repair practices for automatic pressure-relieving devices commonly used in the oil and petrochemical industries. As a guide to the inspection and repair of these devices in the user's plant, it is intended to ensure their proper performance. This publication covers such automatic devices as pressure-relief valves, pilot-operated pressure-relief valves, rupture disks, and weight-loaded pressure-vacuum vents.
The scope of this RP includes the inspection and repair of automatic pressure-relieving devices commonly used in the oil and petrochemical industry. This publication does not cover weak seams or sections in tanks, explosion doors, fusible plugs, control valves, and other devices that either depend on an external source of power for operation or are manually operated. Inspections and tests made at manufacturers' plants, which are usually covered by codes or purchase specifications, are not covered by this publication.
This publication does not cover training requirements for mechanics involved in the inspection and repair of pressure-relieving devices. Those seeking these requirements should see API 510, which gives the requirements for a quality control system and specifies that the repair organization maintain and document a training program ensuring that personnel are qualified. Pages: 65
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

RP 577 ◆
Welding Processes, Inspection, and Metallurgy
Provides guidance to the API authorized inspector on welding inspection as encountered with fabrication and repair of refinery and chemical plant equipment and piping. Common welding processes, welding procedures, welder qualifications, metallurgical effects from welding, and inspection techniques are described to aid the inspector in fulfilling their role implementing API 510, API 570, Std 653 and RP 582. The level of learning and training obtained from this document is not a replacement for the training and experience required to be an American Welding Society (AWS) Certified Welding Inspector (CWI). Pages: 145
2nd Edition | December 2013 | Product Number: C57702 | Price: $225.00

RP 577 *
Welding Processes, Inspection, and Metallurgy—Chinese
Chinese translation of RP 577.
2nd Edition | December 2013
Product Number: C57702CN1420 | Price: $158.00

RP 578 ◆
Material Verification Program for New and Existing Alloy Piping Systems—Chinese
Provides the guidelines for a material and quality assurance system to verify that the nominal composition of alloy components within the pressure envelope of a piping system is consistent with the selected or specified construction materials to minimize the potential for catastrophic release of toxic or hazardous liquids or vapors.
This RP 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: 13
2nd Edition | March 2010 | Product Number: C57802 | Price: $129.00

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

API 579-1/ASME FFS-1 ◆
Fitness-For-Service
Fitness-For-Service (FFS) assessments are quantitative 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 a specific condition that might cause a failure. This standard provides guidance for conducting FFS assessments using methodologies specifically prepared for pressurized equipment.
The guidelines provided in this standard can be used to make run-repair-replace decisions to help determine if components in pressurized equipment containing flaws that have been identified by inspection can continue to operate safely for some period of time. These FFS assessments are currently recognized and referenced by the API Codes and Standards (510, 570, and 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. The methods and procedures in this standard are intended to supplement and augment the requirements in API 510, API 570, API 653, and other post-construction codes that reference FFS evaluations such as NB-23.
The assessment procedures in this standard can be used for FFS assessments and/or rerating of equipment designed and constructed to the following codes: (a) ASME B&PV Code, Section VIII, Division 1; (b) ASME B&PV Code, Section VIII, Division 2; (c) ASME B&PV Code, Section I; (d) ASME B31.1 Piping Code; (e) ASME B31.3 Piping Code; (f) ASME B31.4 Piping Code; (g) ASME B31.8 Piping Code; (h) ASME B31.12 Piping Code; (i) API Std 560; (j) API Std 620; and (k) API Std 530. The assessment procedures in this standard may also be applied to pressure-containing equipment constructed to other recognized codes and standards, including international and internal corporate standards.
The assessment procedures in this standard can be used for FFS assessments and/or rerating of equipment designed and constructed to the following codes: (a) ASME B&PV Code, Section VIII, Division 1; (b) ASME B&PV Code, Section VIII, Division 2; (c) ASME B&PV Code, Section I; (d) ASME B31.1 Piping Code; (e) ASME B31.3 Piping Code; (f) ASME B31.4 Piping Code; (g) ASME B31.8 Piping Code; (h) ASME B31.12 Piping Code; (i) API Std 560; (j) API Std 620; and (k) API Std 530. The assessment procedures in this standard may also be applied to pressure-containing equipment constructed to other recognized codes and standards, including international and internal corporate standards.

This publication is related to an API licensing, certification, or accreditation program.
This standard has broad applications since the assessment procedures are based on allowable stress methods and plastic collapse loads for non-crack-like flaws, and the Failure Assessment Diagram Approach for crack-like flaws. The FFS assessment procedures in this standard can be used to evaluate flaws commonly encountered in pressure vessels, piping, and tankage. The procedures are not intended to provide a definitive guideline for every possible situation that may be encountered. However, flexibility is provided to the user in the form of an advanced assessment level to handle uncommon situations that may require a more detailed analysis.

Copies may be purchased in hard copy, CD, or together for the prices listed below. Please note that the CD product is read-only and cannot be copied or printed. Pages: 1292

3rd Edition | June 2016 | Product Number: C57903
Hard Copy Only Price: $1,070.00
CD Only Price: $1,275.00
Hard Copy and CD Price: $1,760.00

API 579-2/ASME FFS-2
Fitness-For-Service Example Problem Manual

Fitness-For-Service (FFS) assessments in API 579-1/ASME FFS-1 are engineering evaluations that are performed to demonstrate the structural integrity of an in-service component that may contain a flaw or damage or that may be operating under specific conditions that could produce a failure. API 579-1/ASME FFS-1 provides guidance for conducting FFS assessments using methodologies specifically prepared for pressurized equipment. The guidelines provided in this standard may be used to make run-repair-replace decisions to help determine if pressurized equipment containing flaws that have been identified by inspection can continue to operate safely for some period of time. These FFS assessments of API 579-1/ASME FFS-1 are currently recognized and referenced by the API Codes and Standards (510, 514, 570, and 653), and by NB-23 as a 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 Part 1 of API 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 API 579-1/ASME FFS-1. For example, example problems illustrating calculations for local thin areas are provided in Part 5 of this document. This coincides with the assessment procedures for local thin areas contained in Part 5 of API 579-1/ASME FFS-1. Pages: 366

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

RP 580 Risk-Based Inspection

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

RP 581 Risk-Based Inspection Methodology

Provides quantitative procedures to establish an inspection program using risk-based methods for pressurized fixed equipment including pressure vessels, piping, tankage, pressure relief devices (PRDs), and heat exchanger tube bundles. RP 580 provides guidance for developing Risk-Based Inspection (RBI) programs on fixed equipment in refining, petrochemical, chemical process plants, and oil and gas production facilities. The intent is for RP 580 to introduce the principles and present minimum general guidelines for RBI, while this recommended practice provides quantitative calculation methods to determine an inspection plan.

The calculation of risk outlined in API RP 581 involves the determination of a probability of failure (POF) combined with the consequence of failure (COF). Failure is defined as a loss of containment from the pressure boundary resulting in leakage to the atmosphere or rupture of a pressurized component. Risk increases as damage accumulates during in-service operation as the risk tolerance or risk target is approached and an inspection is recommended of sufficient effectiveness to better quantify the damage state of the component. The inspection action itself does not reduce the risk; however, it does reduce uncertainty and therefore allows more accurate quantification of the damage present in the component. Pages: 632

3rd Edition | April 2016 | Product Number: C58103 | Price: $865.00

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

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;
- non-removable internals for process equipment;
- structural items attached and related to process equipment;
- other equipment or component items, when referenced by an applicable purchase document.

This document is general in nature and augments the welding requirements of ASME BPVC Section IX and similar codes, standards, specifications, and practices, such as those listed in Section 2. The intent of this document is to be inclusive of chemical, oil, and gas industry standards, although there are many areas not covered herein, e.g. pipeline welding and offshore structural welding are intentionally not covered. This document is based on industry experience, and any restrictions or limitations may be waived or augmented by the purchaser. Pages: 38

3rd Edition | May 2016 | Product Number: C58203 | Price: $137.00
RP 583 • Corrosion Under Insulation and Fireproofing
Covers the design, maintenance, inspection, and mitigation practices to address external corrosion under insulation (CUI) and corrosion under fireproofing (CUF). The document discusses the external corrosion of carbon and low alloy steels under insulation and fireproofing, and external chloride stress corrosion cracking (ECSCC) of austenitic and duplex stainless steels under insulation. The document does not cover atmospheric corrosion or corrosion at uninsulated pipe supports, but does discuss corrosion at insulated pipe supports.

The purpose of this RP is to:
- help owner/users understand the complexity of the many CUI/CUF issues,
- provide owner/users with understanding the advantages and limitations of the various NDE methods used to identify CUI and CUF damage, and
- provide owner/users with an approach to risk assessment (i.e. likelihood of failure, and consequence of failure) for CUI and CUF damage, and
- provide owner/users guidance on how to design, install, and maintain insulation systems to avoid CUI and CUF damage.

Pages: 88

1st Edition | May 2014 | Product Number: CS8301 | Price: $170.00

RP 584 • Integrity Operating Windows
Explains the importance of IOWs for process safety management and to guide users in how to establish and implement an IOW program for refining and petrochemical process facilities for the express purpose of avoiding unexpected equipment degradation that could lead to loss of containment. It is not the intent of this document to provide a complete list of specific IOWs or operating variables that might need IOWs for the numerous types of hydrocarbon process units in the industry (though some generic examples are provided in the text and in Appendix A), but rather to provide the user with information and guidance on the work process for development and implementation of IOWs for each process unit.

Pages: 35

1st Edition | May 2014 | Product Number: CS8401 | Price: $120.00

RP 585 • Pressure Equipment Integrity Incident Investigation
Provides owner/users with guidelines and recommended practices for developing, implementing, sustaining, and enhancing an investigation program for pressure equipment integrity incidents. This recommended practice describes characteristics of an effective investigation and how organizations can learn from pressure equipment integrity incident investigations. This RP is intended to supplement and provide additional guidance for the OSHA Process Safety Management (PSM) Standard 29 CFR 1910.119 (m) incident investigation requirements, with a specific focus on incidents caused by integrity failures of pressure equipment.

Pages: 41

1st Edition | April 2014 | Product Number: CS8501 | Price: $125.00

Std 653 • Tank Inspection, Repair, Alteration, and Reconstruction
Covers steel storage tanks built to Std 650 and its predecessor Spec 12C. It provides minimum requirements for maintaining the integrity of such tanks after they have been placed in service and addresses inspection, repair, alteration, relocation, and reconstruction. The scope is limited to the tank foundation, bottom, shell, structure, roof, attached appurtenances, and nozzles to the face of the first flange, first threaded joint, or first welding-end connection. Many of the design, welding, examination, and material requirements of Std 650 can be applied in the maintenance inspection, rating, repair, and alteration of in-service tanks. In the case of apparent conflicts between the requirements of this standard and Std 650 or its predecessor Spec 12C, this standard shall govern for tanks that have been placed in service.

This publication is a new entry in this catalog.

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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.
**Std 612**

Petroleum Petrochemical and Natural Gas Industries—Steam Turbines—Special-Purpose Applications

Specifies the minimum requirements for steam turbines for special-purpose applications for use in the petroleum, petrochemical, and natural gas industries. These requirements include basic design, materials, fabrication, inspection testing, and preparation for shipment. It also covers the related lube oil systems, instrumentation, control systems, and auxiliary equipment. It is not applicable to general-purpose steam turbines, which are covered in Std 611. Pages: 146

7th Edition | August 2014 | Product Number: C61207 | Price: $220.00

**Std 613**

Special Purpose Gear Units for Petroleum, Chemical and Gas Industry Services

(ANSI/API Std 613)

(includes Errata 1 dated December 2005)

Covers the minimum requirements for special-purpose, enclosed, precision single- and double-helical one- and two-stage speed increasers and reducers of parallel-shaft design for refinery services. Primarily intended for gear units that are in continuous service without installed spare equipment. Pages: 94

Product Number: C61305 | Price: $165.00

**Std 614/ISO 10438-1:2007**

Lubrication, Shaft-Sealing and Oil-Control Systems and Auxiliaries

(ANSI/API Std 614)

(includes Errata 1 dated May 2008)

Covers the minimum requirements for General Purpose and Special Purpose Oil Systems. The standard also includes requirements for Self-acting Gas Seal Support Systems. The standard includes the systems' components, along with the required controls and instrumentation. Chapters included in Std 614 are: 1. General Requirements; 2. Special-purpose Oil Systems; 3. General-purpose Oil Systems; and 4. Self-acting Gas Seal Support Systems.

This edition of API Std 614 is the identical national adoption of ISO 10438:2007. Pages: 202

Product Number: C61402 | Price: $293.00

**Std 616**

Gas Turbines for the Petroleum, Chemical, and Gas Industry Services

Covers the minimum requirements for open, simple, and regenerative-cycle combustion gas turbine units for services of mechanical drive, generator drive, or process gas generation. All auxiliary equipment required for operating, starting, controlling, and protecting gas turbine units are either discussed directly in this standard or referred to in this standard through references to other publications. Specifically, gas turbine units that are capable of firing gas or liquid or both are covered by this standard. This standard covers both industrial and aeroderivative gas turbines. Pages: 188

Product Number: C61605 | Price: $206.00

**Std 617**

Axial and Centrifugal Compressors and Expander-Compressors

(includes Errata 1 dated August 2016)

Covers the minimum requirements for centrifugal compressors used in petroleum, chemical, and gas industry services that handle air or gas, including process gear mounted. Does not apply to fans or blowers that develop less than 34 kPa (5 psi) pressure rise above atmospheric pressure; these are covered by Std 673. This standard also does not apply to packaged, integrally-gearred centrifugal air compressors, which are covered by Std 672. Pages: 374

8th Edition | September 2014 | Product Number: C61707 | Price: $240.00

**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: C61905 | Price: $216.00

**Std 670**

Machinery Protection Systems

Provides a purchase specification to facilitate the manufacture, procurement, installation, and testing of vibration, axial-position, and bearing temperature monitoring systems for petroleum, chemical, and gas industry services. Covers the minimum requirements for monitoring radial shaft vibration, casing vibration, shaft axial position, and bearing temperatures. It outlines a standardized monitoring system and covers requirements for hardware (sensors and instruments), installation, testing, and arrangement. Pages: 244


**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 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
2-Year Extension: November 2015
Product Number: C67104 | Price: $167.00
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
Covers the minimum requirements for centrifugal fans for use in petroleum, chemical, and gas industry services. Fan static pressure rise is limited to differential usually not exceeding 130 in. (330 cm) of water equivalent air pressure from a single impeller or each impeller in a two stage fan. This standard does not apply to axial flow, aerial cooler, cooling tower, and ventilation fans and positive displacement blowers.
This standard covers equipment for both general purpose and special purpose applications. The purchaser shall determine which classification applies. Refer to Section 3 for definition of the terms general purpose and special purpose.
Additional or overriding requirements applicable to special purpose applications are included at the end of each section (e.g. 6.7.5, etc.).
Pages: 113
3rd Edition | December 2014 | Product Number: C67303 | Price: $170.00

Std 674
Positive Displacement Pumps—Reciprocating
(includes Errata 1 dated May 2014 and Errata 2 dated April 2015)
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
2-Year Extension: November 2015
Product Number: C67403 | Price: $186.00

Std 675
Positive Displacement Pumps—Controlled Volume for Petroleum, Chemical, and Gas Industry Services
(includes Errata 1 dated June 2014 and Errata 2 dated April 2015)
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 pump 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.
This standard requires the purchaser to specify certain details and features. A bullet (•) at the beginning of a paragraph indicates that either a decision by, or further information from, the purchaser is required. Further information should be shown on the datasheets (see example in Annex A) or stated in the quotation request and purchase order.
Pages: 64
3rd Edition | November 2012 | Product Number: C67503 | Price: $127.00

Std 676
Positive Displacement Pumps—Rotary
Covers the minimum requirements for rotary positive displacement process pumps and pump units for use in the petroleum, petrochemical, and gas industry services. Controlled-volume pumps, hydraulically driven pumps, and positive displacement reciprocating pumps are not included.
Pages: 102
3rd Edition | November 2009 | Reaffirmed: March 2015
Product Number: C67603 | Price: $150.00

Std 676 *
Positive Displacement Pumps—Rotary—Chinese
Chinese translation of Std 676.
3rd Edition | November 2009
Product Number: C67603 CN945 | Price: $105.00

Std 677
General-Purpose Gear Units for Petroleum, Chemical, and Gas Industry Services
(includes Errata 1 dated February 2012)
Covers the minimum requirements for general-purpose, enclosed, single, and multistage gear units incorporating parallel shaft helical and right angle spiral bevel gears for the petroleum, chemical, and gas industries. Gears manufactured according to this standard shall be limited to the following pitchline velocities. Helical gears shall not exceed 60 meters per second (12,000 feet per minute), and spiral bevels shall not exceed 40 meters per second (8,000 feet per minute). Typical applications for which this standard is intended are cooling tower water pump systems, forced and induced draft fan systems, and other general-purpose equipment trains.
Pages: 84
Product Number: C67703 | Price: $165.00

Std 681
Liquid Ring Vacuum Pumps and Compressors for Petroleum, Chemical, and Gas Industry Services
Defines the minimum requirements for the basic design, inspection, testing, and preparation for shipment of liquid ring vacuum pump and compressor systems for service in the petroleum, chemical, and gas industries. It includes both vacuum pump and compressor design and system design.
Pages: 86
1st Edition | February 1996 | Reaffirmed: November 2010
2-Year Extension: November 2015
Product Number: C68101 | Price: $142.00

Std 682
Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps
Specifies requirements and gives recommendations for sealing systems for centrifugal and rotary pumps used in the petroleum, natural gas, and chemical industries. See A.1.1 and A.1.2. It is the responsibility of the purchaser or seal vendor to ensure that the selected seal and auxiliaries are suitable for the intended service condition. It is applicable mainly for hazardous, flammable, and/or toxic services where a greater degree of reliability is required for the improvement of equipment availability and the reduction of both emissions to the atmosphere and life-cycle sealing costs. It covers seals for pump shaft diameters from 20 mm (0.75 in.) to 110 mm (4.3 in.). This standard is also applicable to seal spare parts and can be referred to for the upgrading of existing equipment. A classification system for the seal configurations covered by this standard into categories, types, arrangements, and orientations is provided.
This standard is referenced normatively in Std 610. It is applicable to both new and retrofitted pumps and to pumps other than Std 610 pumps (e.g. ASME B73.1, ASME B73.2, and Std 676 pumps). This standard might also be referenced by other machinery standards such as other pumps.

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This publication is a new entry in this catalog.
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compressors, and agitators. Users are cautioned that this standard is not specifically written to address all of the potential applications that a purchaser may specify. This is especially true for the size envelope specified for Std 682 seals. The purchaser and seal vendor shall mutually agree on the features taken from this standard and used in the application. Pages: 256

4th Edition | May 2014 | Product Number: C68204 | Price: $255.00

Std 682 *

Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps—Chinese

Chinese translation of Std 682.

4th Edition | May 2014 | Product Number: C68204C | Price: $179.00

RP 684


Describes, discusses, and clarifies the section of the API Standard Paragraphs that outline the complete lateral and torsional rotodynamics and rotor balancing acceptance program designed by API to ensure equipment mechanical reliability. Background material on the fundamentals of these subjects (including terminology) along with rotor modeling utilized in this analysis is presented for those unfamiliar with the subject. This document is an introduction to the major aspects of rotating equipment vibrations that are addressed during a typical lateral dynamics analysis. Pages: 303

2nd Edition | August 2005 | Reaffirmed: November 2010
Product Number: C68402 | Price: $176.00

Std 685

Sealless Centrifugal Pumps for Petroleum, Petrochemical, and Gas Industry Process Service

Specifies the minimum requirements for sealless centrifugal pumps for use in petroleum, heavy duty petrochemical and gas industry services. This standard is applicable to single stage overhung pumps of two classifications: magnetic drive pumps and canned motor pumps. Pages: 170

2nd Edition | February 2011 | Product Number: C68502 | Price: $206.00

RP 686

Recommended Practice for Machinery Installation and Installation Design

Provides recommended procedures, practices, and checklists for the installation and precommissioning of new, existing, and reapplied machinery and to assist with the installation design of such machinery for petroleum, chemical, and gas industry services facilities. In general, this RP is intended to supplement vendor instructions and the instructions provided by the original equipment manufacturer (OEM) should be carefully followed with regard to equipment installation and checkout. Most major topics of this RP are subdivided into sections of “Installation Design” and “Installation” with the intent being that each section can be removed and used as needed by the appropriate design or installation personnel. Pages: 254

Product Number: C68602 | Price: $187.00

RP 687

Rotor Repair

Covers the minimum requirements for the inspection and repair of special purpose rotating equipment rotors, bearings and couplings used in petroleum, chemical, and gas industry service. Pages: 540

Product Number: C68701 | Price: $267.00

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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 the American Petroleum Institute on the impact of gasoline blended with ethanol on the long-term structural integrity of liquid petroleum storage systems and components. It is anticipated that the use of ethanol in motor fuels will continue to increase. This has generated interest about the potential long-term structural effects of ethanol on liquid petroleum storage systems, including underground storage tanks (USTs), underground piping, and associated components. The objective of the literature review is to determine the state of industry knowledge and research on the effects of ethanol/gasoline blends on the long-term structural integrity of UST systems and components. This review is intended to assist decision-makers on further research requirements and needed changes or supplements to existing standards for underground storage system components used for storing and dispensing gasoline blended with ethanol. Appendix A may be purchased separately as an electronic database file. The database synopsis and bibliographic information for all articles reviewed for the project. The report is organized by article index number. 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

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 in various standard sizes and capacities for internal pressures approximately atmospheric. This specification is designed to provide the oil production industry with safe and economical bolted tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. This specification is for the convenience of purchasers and manufacturers in ordering and fabricating tanks. Pages: 31

16th Edition | November 2014
Product Number: G12B156 | Price: $120.00

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

Covers material, design, fabrication, and testing requirements for vertical, cylindrical, aboveground, closed top, welded steel storage tanks with internal pressures approximately atmospheric at various sizes and capacities ranging from 900 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: 27

11th Edition | October 2008 | Effective Date: April 1, 2009
2-Year Extension: November 2015
Product Number: G12D11 | Price: $97.00

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
2-Year Extension: November 2015
Product Number: G12F12 | Price: $97.00

Spec 12F ✦ Specification for Shop Welded Tanks for Storage of Production Liquids—Chinese

Chinese translation of Spec 12F.

12th Edition | October 2008 | Product Number: G12F12C | Price: $68.00

Spec 12P ✦ Specification for Fiberglass Reinforced Plastic Tanks

Covers material, design, fabrication, and testing requirements for fiberglass reinforced plastic (FRP) tanks. Only shop-fabricated, vertical, cylindrical tanks are covered. Tanks covered by this specification are intended for above ground and atmospheric pressure service. This specification applies to new tanks. The requirements may be applied to existing tanks at the discretion of the owner/operator.

This specification is designed to provide the petroleum industry with various standard sizes of FRP tanks. Because of the versatility of FRP tanks, the user shall be responsible for determining the suitability of FRP tanks for the intended service. Unsupported cone bottom tanks are outside the scope of this specification. Pages: 27

4th Edition | February 2016 | Effective Date: August 1, 2016
Product Number: G12P04 | Price: $108.00

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

For use as a guide for new tank installations and maintenance of existing tanks, Spec 12R1 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

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94  This publication is a new entry in this catalog.  This publication is related to an API licensing, certification, or accreditation program.
fabricated to Specs 12F, 12D, 12F, and 12P when employed in on-land production service, but its basic principles are applicable to atmospheric tanks of other dimensions and specifications when they are employed in similar oil and gas production, treating, and processing services. It is not applicable to refineries, petrochemical plants, marketing bulk stations, or pipeline storage facilities operated by carriers. Pages: 49

2-Year Extension: November 2015 | Product Number: G12R15
Price: $132.00

Std 620
Design and Construction of Large, Welded, Low-Pressure Storage Tanks (includes Addendum 1 dated November 2014)

Covers the design and construction of large field-assembled, welded, low-pressure carbon steel above ground storage tanks (including flat-bottom tanks) that have a single vertical axis of rotation, 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.

Covered are tanks designed for metal temperatures not greater than 250 °F and with pressures in their gas or vapor spaces not more than 15 pounds per square inch gauge. The basic rules in this standard provide for installation in areas where the lowest recorded 1-day mean atmospheric temperature is -50 °F. Annex S covers stainless steel low-pressure storage tanks in ambient temperature service in all areas, without limit on low temperatures. Annex R covers low-pressure storage tanks for refrigerated products at temperatures from +40 °F to -60 °F. Annex Q covers low-pressure storage tanks for liquefied gases at temperatures not lower than -325 °F.

This standard is applicable to tanks that (a) hold or store liquids with gases or vapors above their surface or (b) hold or store gases or vapors alone. These rules do not apply to lift-type gas holders.

Although the rules in this standard do not cover horizontal tanks, they are not intended to preclude the application of appropriate portions to the design and construction of horizontal tanks designed in accordance with good engineering practice. Pages: 277


Std 620 *
Design and Construction of Large, Welded, Low-Pressure Storage Tanks—Chinese

Chinese translation of Std 620.

12th Edition | October 2013 | Product Number: C62012C | Price: $305.00

Std 625
Tank Systems for Refrigerated Liquefied Gas Storage (includes Addendum 1 dated July 2013, Addendum 2 dated November 2014)

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. Included are tank systems having a storage capacity of 800 cubic meters (5000 bbls) and larger. Storage tank shall be liquids which 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. Also covered are 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).

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. Pages: 63

1st Edition | August 2010 | Product Number: C62501 | Price: $232.00

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This recommended practice does not designate specific tank bottom linings for every situation because of the wide variety of service environments. Pages: 24

4th Edition | September 2014 | Product Number: C65204 | Price: $130.00

RP 652 *
Linings of Aboveground Petroleum Storage Tank Bottoms—Chinese
Chinese translation of RP 652.
4th Edition | September 2014 | Product Number: C65204C | Price: $91.00

Std 653 🟠
Tank Inspection, Repair, Alteration, and Reconstruction
Covers steel storage tanks built to Std 650 and its predecessor Spec 12C. It provides minimum requirements for maintaining the integrity of such tanks after they have been placed in service and addresses inspection, repair, alteration, relocation, and reconstruction.

The scope is limited to the tank foundation, bottom, shell, structure, roof, attached appurtenances, and nozzles to the face of the first flange, first threaded joint, or first welding-end connection. Many of the design, welding, examination, and material requirements of Std 650 can be applied in the maintenance inspection, rating, repair, and alteration of in-service tanks. In the case of apparent conflicts between the requirements of this standard and Std 650 or its predecessor Spec 12C, this standard shall govern for tanks that have been placed in service.

This standard employs the principles of Std 650; however, storage tank owner/operators, based on consideration of specific construction and operating details, may apply this standard to any steel tank constructed in accordance with a tank specification.

This standard is intended for use by organizations that maintain or have access to engineering and inspection personnel technically trained and experienced in tank design, fabrication, repair, construction, and inspection.

This standard does not contain rules or guidelines to cover all the varied conditions which may occur in an existing tank. When design and construction details are not given, and are not available in the as-built standard, details that will provide a level of integrity equal to the level provided by the current edition of Std 650 must be used.

This standard recognizes fitness-for-service assessment concepts for evaluating in-service degradation of pressure containing components. API 579-1/ASME FFS-1, Fitness-For-Service, provides detailed assessment procedures or acceptance criteria for specific types of degradation referenced in this standard. When this standard does not provide specific evaluation procedures or acceptance criteria for a specific type of degradation or when this standard explicitly allows the use of fitness-for-service criteria, API 579-1/ASME FFS-1 may be used to evaluate the various types of degradation or test requirements addressed in this standard. Pages: 162


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

5th Edition | November 2014 | Product Number: C65305C | Price: $165.00

Publ 937
Evaluation of Design Criteria for Storage Tanks with Frangible Roof Joints
Describes research that evaluated the ability of the present Std 650 tank design criteria to ensure the desired frangible joint behavior. Particular questions include:

- evaluation of the area inequality as a method to predict the buckling response of the compression ring,
- effect of roof slope, tank diameter, and weld size on the frangible joint, and
- effect of the relative strength of the roof-to-shell joint compared to the shell-to-bottom joint. Pages: 73

1st Edition | April 1996 | Product Number: C93701 | Price: $135.00

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 frangible roof design criteria applicable to smaller tanks. Pages: 68

1st Edition | August 2005 | Product Number: C937A0 | Price: $122.00

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 (SCC) in carbon steel equipment used in distribution, transportation, storage, and blending of denatured fuel ethanol. API, with assistance from the Renewable Fuels Association (RFA), conducted research on the potential for metal cracking and product leakage in certain portions of the fuel ethanol distribution system. TR 939-D contains a review of existing literature, results of an industry survey on cracking events and corrosion field monitoring, and information on mitigation and prevention. Pages: 172

2nd Edition | May 2007 | Product Number: C939D0 | Price: $160.00

Std 2015 🟠
Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks
Applies to stationary atmospheric and low-pressure (up to and including 15 psig) aboveground petroleum storage tanks used in all sectors of the petroleum and petrochemical industry, including:

- crude oil and gas production,
- refining; petrochemicals,
- pipelines and terminals,
- bulk storage, and
- ethanol facilities.

This standard provides requirements for safely planning, coordinating, and conducting tank entry and cleaning operations, from removal from service through return to service. This standard does not and cannot cover every possible unique hazard or situation that may arise during tank cleaning operations. Site, product and tank-specific hazards and situations must be addressed by employers using the appropriate principles and considerations provided for by this standard. Pages: 60

7th Edition | May 2014 | Product Number: K20157 | Price: $150.00

RP 2016 🟠
Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks
(ANSI/API RP 2016)
Supplements the requirements of Std 2015, Seventh Edition. This recommended practice (RP) provides guidance and information on the specific aspects of tank cleaning in order to assist employers (owners/operators and contractors) to conduct safe tank cleaning operations in accordance with the requirements of Std 2015. Pages: 98

Product Number: K20161 | Price: $192.00

Publ 2026 🟠
Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service
Provides safety information for individuals responsible for performing maintenance or repairs that involve descent onto the floating roofs of petroleum storage tanks. Pages: 15

Product Number: K20262 | Price: $62.00

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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
Product Number: K22076 | Price: $86.00

Std 2510

Design and Construction of LPG Installations
Provides minimum requirements for the design and construction of installations for the storage and handling of liquefied petroleum gas (LPG) at marine and pipeline terminals, natural gas processing plants, refineries, petrochemical plants, and tank farms. This standard covers storage vessels, loading and unloading systems, piping, and related equipment. Pages: 22
Product Number: C25108 | Price: $103.00

Std 2510 *
Design and Construction of LPG Installations—Spanish
Spanish translation of Std 2510.
8th Edition | May 2001 | Product Number: C25108SP | Price: $103.00

Std 2610

Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities
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, pollution prevention and waste management, safe operations, fire prevention and protection, tanks, dikes and berms, mechanical systems (piping, valves, pumps, and plumbing systems), product transfer, corrosion protection, structures, utilities and yard, and removals and decommissioning. The purpose of this standard is to consolidate a wide base of current industry experience, knowledge, information, and management practices into a cohesive standard comprising a range of best practices. Pages: 53
2nd Edition | May 2005 | Reaffirmed: December 2010
2-Year Extension: May 2016 | Product Number: C26102 | Price: $122.00

PRESURE-RELIEVING SYSTEMS FOR REFINERY SERVICE

Std 520, Part I
Sizing, Selection, and Installation of Pressure-Relieving Devices—Part I—Sizing and Selection
Applies to the sizing and selection of pressure relief devices used in refineries and related industries for equipment that has a maximum allowable working pressure of 15 psig (103 kPag) or greater. The pressure relief devices covered in this standard are intended to protect unfired pressure vessels and related equipment against overpressure from operating and fire contingencies.

This standard includes basic definitions and information about the operational characteristics and applications of various pressure relief devices. It also includes sizing procedures and methods based on steady state flow of Newtonian fluids. Atmospheric and low-pressure storage tanks covered in 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: 143

Std 520, Part I *
Sizing, Selection, and Installation of Pressure-Relieving Devices—Part I—Sizing and Selection—Russian
Russian translation of Std 520, Part I.

RP 520, Part II
Sizing, Selection, and Installation of Pressure-Relieving Devices—Part II—Installation
Covers the methods of installation for pressure relief devices for equipment that has a maximum allowable working pressure (MAWP) of 15 psig (1.03 bar g) or greater. Pressure relief valves or rupture disks may be used independently or in combination with each other to provide the required protection against excessive pressure accumulation. The term “pressure relief valve” includes safety relief valves used in either compressible or incompressible fluid service, and relief valves used in incompressible fluid service. Covers gas, vapor, steam, and incompressible fluid service. Pages: 55

Std 521
Pressure-Relieving and Depressuring Systems
Applies to pressure relieving and vapor depressuring systems. Although intended for use primarily in oil refineries, it is also applicable to petrochemical facilities, gas plants, liquefied natural gas (LNG) facilities, and oil and gas production facilities. 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 standard specifies requirements and gives guidelines for the following:
* examining the principal causes of overpressure;
* determining individual relieving rates;
* selecting and designing disposal systems, including such component parts as piping, vessels, flares, and vent stacks.
This standard does not apply to direct-fired steam boilers. Pages: 248

Std 526
Flanged Steel Pressure-Relief Valves
(includes Errata 1 dated May 2009 and Errata 2 dated October 2012)
Purchase specification for flanged steel pressure-relief valves. Basic requirements are given for direct spring-loaded pressure-relief valves and pilot-operated pressure-relief valves as follows:
* orifice designation and area;
* valve size and pressure rating, inlet and outlet;
* materials;
* pressure-temperature limits;

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- center-to-face dimensions, inlet and outlet.

Nameplate nomenclature and requirements for stamping are detailed in Annex A. Pages: 43

Product Number: C52606 | Price: $156.00

Std 526 *
Flanged Steel Pressure-Relief Valves—Russian

Russian translation of Std 526.
6th Edition | April 2009 | Product Number: C52606R | Price: $125.00

Std 527
Seat Tightness of Pressure Relief Valves

Describes methods of determining the seat tightness of metal- and soft-seated pressure relief valves, including those of conventional, bellows, and pilot-operated designs.
The maximum acceptable leakage rates are defined for pressure relief valves with set pressures from 103 kPa gauge (15 psig) to 41,379 kPa gauge (6,000 psig). If greater seat tightness is required, the purchaser shall specify it in the purchase order.
The test medium for determining the seat tightness—air, steam, or water—shall be the same as that used for determining the set pressure of the valve.
For dual-service valves, the test medium—air, steam, or water—shall be the same as the primary relieving medium.
To ensure safety, the procedures outlined in this standard shall be performed by persons experienced in the use and functions of pressure relief valves.

Pages: 5
4th Edition | November 2014 | Product Number: C52704 | Price: $90.00

RP 576 *
Inspection of Pressure-Relieving Devices

Describes the inspection and repair practices for automatic pressure-relieving devices commonly used in the oil and petrochemical industries. As a guide to the inspection and repair of these devices in the user's plant, it is intended to ensure their proper performance. This publication covers such automatic devices as pressure-relief valves, pilot-operated pressure-relief valves, rupture disks, and weight-loaded pressure-vacuum vents.
The scope of this RP includes the inspection and repair of automatic pressure-relieving devices commonly used in the oil and petrochemical industry. This publication does not cover weak seams or sections in tanks, explosion doors, fusible plugs, control valves, and other devices that either depend on an external source of power for operation or are manually operated. Inspections and tests made at manufacturers' plants, which are usually covered by codes or purchase specifications, are not covered by this publication.
This publication does not cover training requirements for mechanics involved in the inspection and repair of pressure-relieving devices. Those seeking these requirements should see API 510, which gives the requirements for a quality control system and specifies that the repair organization maintain and document a training program ensuring that personnel are qualified.

Pages: 65
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

Covers the normal and emergency vapour venting requirements for aboveground liquid petroleum or petroleum products storage tanks and aboveground and underground refrigerated storage tanks, designed for operation at pressures from full vacuum through 103,4 kPa (ga) [15 psig]. Discussed in this International Standard are the causes of overpressure and vacuum; determination of venting requirements; means of venting; selection, and installation of venting devices; and testing and marking of relief devices.
This International Standard is intended for tanks containing petroleum and petroleum products but it can also be applied to tanks containing other liquids; however, it is necessary to use sound engineering analysis and judgment whenever this International Standard is applied to other liquids.
This International Standard does not apply to external floating-roof tanks.

Pages: 87
7th Edition | March 2014 | Product Number: C20007 | Price: $225.00

Piping and Valve Standards

API 570 *
Piping Inspection Code: In-Service Inspection, Rating, Repair, and Alteration of Piping Systems

Covers inspection, rating, repair, and alteration procedures for metallic and fiberglass reinforced plastic (FRP) piping systems and their associated pressure relieving devices that have been placed in service. This inspection code applies to all hydrocarbon and chemical process piping covered in 1.2.1 that have been placed in service unless specifically designated as optional per 1.2.2. This publication does not cover inspection of specialty equipment including instrumentation, exchanger tubes, and control valves. However, this piping code could be used by owner/users in other industries and other services at their discretion. Process piping systems that have been retired from service and abandoned in place are no longer covered by this “in-service inspection” Code. However abandoned in place piping may still need some amount of inspection and/or risk mitigation to assure that it does not become a process safety hazard because of continuing deterioration. Process piping systems that are temporarily out of service but have been mothballed (preserved for potential future use) are still covered by this Code.

Pages: 88

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 of inspection practices. This recommended practice 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 inspectors in fulfilling their role implementing API 570. This publication does not cover inspection of specialty items, including instrumentation, furnace tubulars, and control valves.

Pages: 113

RP 578 *
Material Verification Program for New and Existing Alloy Piping Systems

Provides the guidelines for a material and quality assurance system to verify that the nominal composition of alloy components within the pressure envelope of a piping system is consistent with the selected or specified construction materials to minimize the potential for catastrophic release of toxic or hazardous liquids or vapors.

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Check Valves: Flanged, Lug, Wafer, and Butt-Welding

• Type “A” check valves are short face-to-face and can be: wafer, lug, or wafer check valves:
  - SB 574
  - Steel Gate Valves—Flanged and Butt-Welding Ends
  - B16.5
  - B16.34
  - B16.42
  - 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 of 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.

• Single or double gate, non-rising handwheels, outside screw and yoke, rising stems, non-rising handwheels, single or double gate, wedge or parallel seating, metallic seating surfaces, flanged or butt-welding ends.

It covers valves of the nominal pipe sizes DN:
  - 25, 32, 40, 50, 65, 80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1050; corresponding to nominal pipe sizes NPS:
  - 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42;

and applies to pressure class designations:
  - 150, 300, 600, 900, 1500, 2500. Pages: 33

13th Edition | January 2015 | Effective Date: July 15, 2015
Product Number: C60013 | Price: $135.00

Steel Gate Valves—Flanged and Butt-Welding Ends, Bolted Bonnets—Chinese

Chinese translation of Std 600.

13th Edition | January 2015 | Product Number: C60013C | Price: $95.00
Refining

Phone Orders: +1 800 854 7179 (Toll-free: U.S. and Canada)  Phone Orders: +1 303 397 7956 (Local and International)

Std 602 ●
Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries
(includes Errata 1 dated September 2016)

Specifies the requirements for a series of compact steel gate, globe, and check valves for petroleum and natural gas industry applications. It is applicable to valves of:
- nominal pipe sizes NPS 1/4, NPS 3/8, NPS 1/2, NPS 3/4, NPS 1, NPS 1 1/4, NPS 1 1/2, NPS 2, NPS 2 1/2, NPS 3, and NPS 4;
- corresponding to nominal sizes DN 8, DN 10, DN 15, DN 20, DN 25, DN 32, DN 40, DN 50, DN 65, DN 80, and DN 100.

It is also applicable to pressure designations of Class 150, Class 300, Class 600, Class 800, and Class 1500. Class 800 is not a listed class designation, but is an intermediate class number widely used for socket welding and threaded end compact valves.

It includes provisions for the following valve characteristics:
- Outside screw with rising stems (OS & Y), in sizes 1/2-4 NPS 4 (8 DN 100) and pressure designations including Class 800.
- Inside screw with rising stems (ISRS), in sizes 1/2-4 NPS 2 1/2 (8 DN 65) and pressure designations of classes 800.
- Socket welding or threaded ends, in sizes 1/2-4 NPS 2 1/2 (8 DN 65) and pressure designations of Class 800 and Class 1500.
- Flanged or butt-welding ends, in sizes 1/2-4 NPS 4 (15 DN 100) and pressure designations of Class 150 through Class 1500, excluding flanged end Class 800.
- Bonnet joint construction—bolted, welded, and threaded with seal weld for classes 1500 and union nut for classes 800.
- Standard and full-bore body seat openings.
- Materials, as specified.
- Testing and inspection.

This publication is applicable to valve end flanges in accordance with ASME B16.5, valve body ends having tapered pipe threads to ASME B1.20.1 or 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 covers requirements for corrosion resistant gate valves for use in process piping applications. Covered are requirements for outside-screw-and-yoke (OS&Y) valves with rising stems, non-rising hand-wheels, bolted bonnets, and various types of gate configurations. Pages: 19

8th Edition | February 2013 | Product Number: C60308 | Price: $80.00

Std 602 *
Corrosion-Resistant, Bolted Bonnet Gate Valves—Flanged and Butt-Welding Ends

Russian translation of Std 602.

8th Edition | February 2013 | Product Number: C60308R | Price: $64.00

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Std 607 ●
Fire Test for Quarter-Turn Valves and Valves Equipped with Nonmetallic Seats

Specifies fire type-testing requirements and a fire type-test method for confirming the pressure-containing capability of quarter-turn valves and other valves with nonmetallic seating under pressure during and after the fire test. It does not cover the testing requirements for valve actuators other than manually operated gear boxes or similar mechanisms when these form part of the normal valve assembly. Other types of valve actuators (e.g., electrical, pneumatic, or hydraulic) may need special protection to operate in the environment considered in this valve test, and the fire testing of such actuators is outside the scope of this standard. Pages: 14

7th Edition | June 2016 | Product Number: C60707 | Price: $97.00

Std 608 ●
Metal Ball Valves—Flanged, Threaded, and Welding Ends

Specifies the requirements for metal ball valves suitable for petroleum, petrochemical and industrial applications that have butt-welding or flanged ends for NPS 1/2 through NPS 20 and threaded and socket-welding ends for NPS 1 1/4 through NPS 2, corresponding to the nominal pipe sizes in ASME B36.10M. Also applies to metal ball valves in pressure classes 150, 300, and 600 for flanged and butt-welding ends and in pressure classes 150, 300, 600, and 800 for socket-welding and threaded ends. Establishes requirements for bore sizes described as full bore, single reduced bore, and double reduced bore. Covers additional requirements for ball valves that are otherwise in full conformance to the requirements of ASME B16.34, Standard Class. Pages: 15


Std 608 *
Metal Ball Valves—Flanged, Threaded, and Welding Ends—Chinese

Chinese translation of Std 608.

5th Edition | November 2012 | Product Number: C60805C | Price: $77.00

Std 608 *
Metal Ball Valves—Flanged, Threaded, and Welding Ends—Russian

Russian translation of Std 608.

5th Edition | November 2012 | Product Number: C60805R | Price: $88.00

Std 609 ●
Butterfly Valves: Double-Flanged, Lug- and Wafer-Type

Covers design, materials, face-to-face dimensions, pressure-temperature ratings, and examination, inspection, and test requirements for gray iron, ductile iron, bronze, steel, nickel-based alloy, or special alloy butterfly valves that provide tight shutoff in the closed position. The following two categories of butterfly valves are included.

Category A—Manufacturer's rated cold working pressure (CWP) butterfly valves, usually with a concentric disc and seat configuration. Sizes covered are NPS 2 to NPS 48 for valves having ASME Class 125 or Class 150 flange bolting patterns.

Category B—ASME Class and pressure-temperature rated butterfly valves that have an offset seat and either an eccentric or a concentric disc configuration. These valves may have a seat rating less than the body rating. For lug and wafer, Class 150, 300, and 600, sizes covered are NPS 2 to NPS 48 for valves having ASME Class 125 or Class 150 flange bolting patterns.

8th Edition | February 2016 | Effective Date: August 1, 2016
Product Number: C60908 | Price: $105.00

This publication is a new entry in this catalog.

This publication is related to an API licensing, certification, or accreditation program.
RP 615 ●
Valve Selection Guide
Provides general guidance on valve selection for the hydrocarbon processing industry, which includes refineries and petrochemical, chemical, and liquefied natural gas plants and their various associated processes. Selection guidance is provided for valve types covered by ASME B16.34 and API Valve Standards for the Downstream Segment, which include gate, ball, plug, butterfly, check, and globe valves.
Modulating control valves and pressure-relief valves are outside the scope of this recommended practice. Pages: 36

2nd Edition | August 2016 | Product Number: C61502 | Price: $88.00

RP 621
Reconditioning of Metallic Gate, Globe, and Check Valves
Provides guidelines for reconditioning heavy wall (Std 600 and Std 594 type) carbon steel, ferritic alloy (up to 9 % Cr), stainless steel, and nickel alloy gate, globe, and check valves for ASME pressure classes 150, 300, 400, 600, 900, 1500, and 2500. Guidelines contained in this RP apply to flanged and butt weld cast or forged valves.
This RP does not cover reconditioning or remanufacturing of used or surplus valves intended for resale. The only intent of this RP is to provide guidelines for refurbishing an end user's (owner) valves for continued service in the owner's facility. Valves reconditioned or remanufactured to this RP may not meet API standard requirements for new valves. Pages: 26

Product Number: C62103 | Price: $140.00

RP 621 *
Reconditioning of Metallic Gate, Globe, and Check Valves—Russian
Russian translation of RP 621.
3rd Edition | August 2010 | Product Number: C62103R | Price: $112.00

Std 622
Type Testing of Process Valve Packing for Fugitive Emissions
Specifies the requirements for comparative testing of block valve stem packing for process applications where fugitive emissions are a consideration. Packing(s) shall be suitable for use at -29 °C to 538 °C (-20 °F to 1000 °F). Factors affecting fugitive emissions performance that are considered by this standard include temperature, pressure, thermal cycling, mechanical cycling, and corrosion. Pages: 29

Product Number: C62202 | Price: $140.00

Std 623
Steel Globe Valves—Flanged and Butt-Welding Ends, Bolted Bonnets
Specifies the requirements for a heavy-duty series of bolted bonnet steel globe valves for petroleum refinery and related applications where corrosion, erosion, 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 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,

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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 applies to the classification of locations for both temporarily and permanently installed electrical equipment. RP 500 is intended to be applied where there may be a risk of ignition due to the presence of flammable gas or vapor, mixed with air under normal atmospheric conditions. Pages: 146

3rd Edition | December 2012 | Product Number: C50003 | Price: $279.00

RP 500 *
Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2—Kazakh
Kazakh translation of RP 500.
3rd Edition | December 2012 | Product Number: C50003K | Price: $224.00
RP 505
Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, Zone 1 and Zone 2 (ANSI/API RP 505)
Provides guidelines for determining the degree and extent of Class I, Zone 0, Zone 1, and Zone 2 locations at petroleum facilities, for the selection and installation of electrical equipment. Basic definitions provided in the National Electrical Code have been followed in developing this document which applies to the classification of locations for both temporarily and permanently installed in electrical equipment. RP 505 is intended to be applied where there may be a risk of ignition due to the presence of flammable gas or vapor, mixed with air under normal atmospheric conditions. Pages: 131
1st Edition | November 1997 | Reaffirmed: August 2013
Product Number: C50501 | Price: $203.00

RP 540
Electrical Installations in Petroleum Processing Plants
Provides information on electrical installations in petroleum processing plants. It is intended for all individuals and organizations concerned with the safe design, installation, and operation of electrical facilities in petroleum processing plants. Pages: 107
Product Number: C54004 | Price: $188.00

Std 541
Form-Wound Squirrel Cage Induction Motors—375 kW (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: 160
5th Edition | December 2014 | Product Number: C54105 | Price: $190.00

RP 545
Recommended Practice for Lightning Protection of Aboveground Storage Tanks for Flammable or Combustible Liquids
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
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;
- 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:
- the conventional salient-pole rotor with solid or laminated poles, and
- the cylindrical rotor with solid or laminated construction.
Also included are new datasheet guides to help clarify the datasheet requirements. Pages: 191
Product Number: C54603 | Price: $208.00

Std 547
General-Purpose Form-Wound Squirrel Cage Induction Motors—250 Horsepower and Larger
Covers the requirements for form-wound induction motors for use in general-purpose petroleum, chemical, and other industrial severe duty applications. These motors:
- are rated 250 hp (185 kW) through 3000 hp (2250 kW) for 4, 6, and 8 pole speeds,
- are not induction generators. Pages: 30
1st Edition | January 2005 | Product Number: C54701 | Price: $94.00

HEAT TRANSFER EQUIPMENT STANDARDS FOR REFINERY SERVICE

Std 530
Calculation of Heater-Tube Thickness in Petroleum Refineries
Specifies the requirements and gives recommendations for the procedures and design criteria used for calculating the required wall thickness of new tubes and associated component fittings for fired heaters for the petroleum, petrochemical, and natural gas industries. These procedures are appropriate for designing tubes for service in both corrosive and non-corrosive applications. These procedures have been developed specifically for the design of refinery and related 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; Annex A describes a technique for estimating the life remaining for a heater tube. Pages: 264
7th Edition | April 2015 | Product Number: C53007 | Price: $290.00

RP 534
Heat Recovery Steam Generators
Provides guidelines for the selection and 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
2-Year Extension: April 2013 | 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 RP does not provide rules for design, but indicates areas that need attention. It offers information and descriptions of burner types available to the designer/user for purposes of selecting the appropriate burner for a given application.

The burner types discussed are those currently in industry use. It is not intended to imply that other burner types are not available or recommended. Many of the individual features described in these guidelines are applicable to most burner types.

In addition to specification of burners, this RP has been updated to include practical guidelines for troubleshooting in service burners as well as including considerations for safe operation. Pages: 84

3rd Edition | May 2014 | Product Number: C53503 | Price: $150.00

RP 536  
Post Combustion NOx Control for Fired 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 (FGR). 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 vapor-depressurizing systems for the 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 537/ISO 25457:2008 *

Flare Details for General Refinery and Petrochemical Service—Chinese

Chinese translation of Std 537.

2nd Edition | December 2008
Product Number: C53702C | Price: $152.00

RP 538  
Industrial Fired Boilers for General Refinery and Petrochemical Service

Specifies requirements and gives recommendations for design, operation, maintenance, and troubleshooting considerations for industrial fired boilers used in refineries and chemical plants. Covers waterside control, combustion control, burner management systems, feedwater preparation, steam purity, emissions, and more.

This recommended practice (RP) is based on the accumulated knowledge and experience of manufacturers and users of industrial fired boilers. It directly meets the business needs of refining and petrochemical industry operator-users, equipment vendors and manufacturers, and contractors. This RP reflects prevailing technical expertise.

This RP does not apply to fire tube boilers, gas turbine exhaust boilers, or fluidized bed boilers. It does not cover boiler mechanical construction, nor does it cover forced circulation boilers. Pages: 348

1st Edition | October 2015 | Product Number: C53801 | Price: $305.00

Std 560  
Fired Heaters for General Refinery Service

Specifies requirements and gives recommendations for the design, materials, fabrication, inspection, testing, preparation for shipment, and erection of fired heaters, air preheaters (APHs), fans, and burners for general refinery service. This standard does not apply to the design of steam reformers or pyrolysis furnaces. Pages: 327

5th Edition | February 2016 | Product Number: C56005 | Price: $335.00

RP 573  
Inspection of Fired Boilers and Heaters

Covers the inspection practices for fired boilers and process heaters (furnaces) used in petroleum refineries and petrochemical plants. The practices described in this document are focused to improve equipment reliability and plant safety by describing the operating variables which impact reliability and to ensure that inspection practices obtain the appropriate data, both on-stream and off-stream, to assess current and future performance of the equipment. Pages: 109

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

Std 660  
Shell-and-Tube Heat Exchangers

Specifies requirements and gives recommendations for the mechanical design, material selection, fabrication, inspection, testing, and preparation for shipment of shell-and-tube heat exchangers for the petroleum, petrochemical, and natural gas industries. This standard is applicable to the following types of shell-and-tube heat exchangers: heaters, condensers, coolers, and reboilers. This standard is not applicable to vacuum-operated steam surface condensers and feed-water heaters. Pages: 62

9th Edition | March 2015 | Product Number: C66009 | Price: $185.00

Std 661  
Petroleum, Petrochemical, and Natural Gas Industries—Air-Cooled Heat Exchangers for General Refinery Service (ANSI/API Std 661)

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  

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.
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This edition of Std 662-1 is an identical national adoption of ISO 15547-1:2005. Pages: 34
2-Year Extension: May 2016 | 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 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 Std 662-2 is an identical national adoption of ISO 15547-2:2005. Pages: 34
2-Year Extension: May 2016 | Product Number: CX662201 | Price: $132.00

Std 663
Hairpin-Type Heat Exchangers

Specifies requirements and gives recommendations for the mechanical design, materials selection, fabrication, inspection, testing, and preparation for shipment of hairpin heat exchangers for use in the petroleum, petrochemical, and natural gas industries. Hairpin heat exchangers include double-pipe and multi-tube type heat exchangers. Pages: 44
1st Edition | May 2014 | Product Number: C66301 | Price: $175.00

Std 664
Spiral Plate Heat Exchangers

Specifies the requirements and gives recommendations for the mechanical design, materials selection, fabrication, inspection, testing, and preparation for shipment of spiral plate heat exchangers for the petroleum, petrochemical, and natural gas industries. It is applicable to standalone spiral plate heat exchangers and those integral with a pressure vessel. Pages: 39
1st Edition | March 2014 | Product Number: C66401 | Price: $175.00

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: 233
2nd Edition | February 2016 | Product Number: C55102 | Price: $157.00

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 telemeasuring transmission. Pages: 39
1st Edition | October 1994 | Reaffirmed: August 2015
2-Year Extension: November 2012
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 piston (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 (FCCU) 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 topics 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
2-Year Extension: November 2012
Product Number: C55402 | Price: $139.00

RP 554, Part 1 *

2nd Edition | July 2007 | Product Number: C55402R | Price: $112.00

RP 554, Part 2
Process Control Systems, Part 2—Process Control System Design

Addresses the processes required to successfully implement process control systems for refinery and petrochemical services. The major topic addressed in Part 2 is practices to select and design the installation for hardware and software required to meet the functional and integration requirements. Pages: 65
2-Year Extension: November 2012
Product Number: C554201 | Price: $139.00

RP 554, Part 2 *

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 system. Pages: 40
2-Year Extension: November 2012
Product Number: C554301 | Price: $107.00

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This single screen approach provides access to the latest API physical property Data Books with a modern Windows interface that is so unique it is patented. API Technical Database replaces the printed format of the popular API Tech petroleum fraction distillation interconversions. Users can quickly determine refinery process systems with the API Technical Database. Version 1.0 of the Electronic Version of the API Technical Data Book

TECHNICAL DATA BOOK PETROLEUM REFINING

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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 RP are the following: oil fired and combination fired heaters; water tube boilers which 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; and 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

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: RELATED ITEMS

Reports Issued by Research Project 49
1951
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

CHARACTERIZATION AND THERMODYNAMICS

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.

Pubi 705, Tetralin, 1978
Pubi 706, cis- and trans-Decalin, 1978
Pubi 707, Naphthalene, 1978
Pubi 708, Anthracene and Phenanthrene 9, 1979
Pubi 709, Four-Ring Condensed Aromatic Compounds, 1979
Pubi 710, Pyridine and Phenylpyridines, 1979
Pubi 711, Quinoline, 1979
Pubi 712, Isoquinoline, 1979
Pubi 713, Indanols, 1980
Pubi 714, Indan and Indene, 1980
Pubi 715,acenaphthylene, acenaphthene, Fluorene, and Fluoranthene, 1981
Pubi 716, Carbazole, 9-Methylcarbazole, and Acidine, 1981
Pubi 717, Thiophene, 2,3- and 2,5-Dihydrothiophene, and Tetrahydrothiophene, 1981
Pubi 718, Aniline, 1982

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Pubi 719, Indole, 1982
Pubi 720, 2-, 3-, and 4-Methylaniline, 1983
Pubi 721, Benzoafuran, Dibenzoafuran, and Benzonaphthofurans, 1983
Pubi 722, Isopropylbenzene, and 1-Methyl-2-, 3-, and 4-Isopropylbenzene, 1984
Pubi 723, tert-Butyl methyl ether, 1984
Pubi 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 Experience; and 6. Repair Procedures.

Impact of Gasoline Blended with Ethanol on the Long-Term Structural Integrity of Liquid Petroleum Storage Systems and Components  
Summarizes the results of a literature review conducted for the American Petroleum Institute on the impact of gasoline blended with ethanol on the long-term structural integrity of liquid petroleum storage systems and components. It is anticipated that the use of ethanol in motor fuels will continue to increase. This has generated interest about the potential long-term structural effects of ethanol on liquid petroleum storage systems, including underground storage tanks (USTs), underground piping, and associated components. The objective of the literature review is to determine the state of industry knowledge and research on the effects of ethanol/gasoline blends on the long-term structural integrity of UST systems and components. This review is intended to assist decision-makers on further research requirements and needed changes or supplements to existing 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

Product Number: C57102 | Price: $329.00

RP 571 *  
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 thereunto;
• tanks and attachments welded thereto;
• non-removable internals for process equipment;
• structural items attached and related to process equipment;
• other equipment or component items, when referenced by an applicable purchase document.

This document is general in nature and augments the welding requirements of ASME BPVC Section IX and similar codes, standards, specifications, and practices, such as those listed in Section 2. The intent of this document is to be inclusive of chemical, oil, and gas industry standards, although there are many areas not covered herein, e.g. pipeline welding and offshore structural welding are intentionally not covered. This document is based on industry experience, and any restrictions or limitations may be waived or augmented by the purchaser. Pages: 38

3rd Edition | May 2016 | Product Number: C58203 | Price: $137.00

TR 932-A  
A 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: 49

2nd Edition | September 2002 | Product Number: C93240 | Price: $151.00

Pubi 932-B  
Design, Materials, Fabrication, Operation, and Inspection Guidelines for Corrosion Control in Hydroprocessing Reactor Effluent Air Cooler (REAC) Systems  
(includes Errata 1 dated January 2014)

Provides guidance to engineering and plant personnel on equipment and piping design, material selection, fabrication, operation, and inspection practices to manage corrosion and fouling in the wet sections of hydroprocessing reactor effluent systems. The reactor effluent system includes all equipment and piping between the exchanger upstream of the wash water injection point and the cold, low-pressure separator (CLPS). The majority of these systems have an air cooler; however, some systems utilize 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

Product Number: C57102 | Price: $329.00

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only shell-and-tube heat exchangers. Reactor effluent systems are prone to fouling and corrosion by ammonium bisulfide (NH₄HS) and ammonium chloride (NH₄Cl), salts. 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 (includes Addendum 1 dated February 2010 and Addendum 2 dated March 2012)

Presents materials and fabrication requirements for new 2 1/4Cr-1Mo and 3Cr steel heavy wall pressure vessels for high-temperature, high-pressure hydrogen service. It applies to vessels that are designed, fabricated, certified, and documented in accordance with ASME BPVC, Section VIII, Division 2, including Section 3.4, Supplemental Requirements for Cr-Mo Steels and ASME Code Case 2151, as applicable. This document may also be used as a resource when planning to modify an existing heavy wall pressure vessel.

A newer ASME BPVC, Section VIII, Division 3, is available and has higher design allowances; however, it has much stricter design rules (e.g., fatigue and fracture mechanics analyses required) and material testing requirements. It is outside the scope of this document.

Materials covered by this recommended practice are conventional steels, including standard 2 1/4Cr-1Mo and 3Cr-1Mo steels, and advanced steels, which include 2 1/4Cr-1Mo-1/4V, 3Cr-1Mo-1/4V-Ti-B, and 3Cr-1Mo-1/4V-Nb-Ca steels. This document may be used as a reference for the fabrication of vessels made of enhanced steels (steels with mechanical properties augmented by special heat treatments) at purchaser discretion. However, no attempt has been made to cover specific requirements for the enhanced steels. Pages: 19

Product Number: C934A02 | Price: $107.00

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

Russian translation of RP 934-A.

2nd Edition | May 2008 | Product Number: C934A02R | Price: $86.00

TR 934-B
Fabrication Considerations for Vanadium-Modified Cr-Mo Steel Heavy Wall Pressure Vessels

Best practice guideline to be used by fabricators, in conjunction with RP 934-A, when constructing new heavy wall pressure vessels with vanadium-modified Cr-Mo steel pipes. The document presents typical fabrication methods used during manufacture, based upon experience and the knowledge gained from actual problems that do not occur during the fabrication of vanadium-modified Cr-Mo steels. Pages: 29

1st Edition | April 2011 | Product Number: C934B01 | Price: $135.00

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)

Presents materials and fabrication requirements for new 1 1/4Cr-1/2Mo steel heavy wall pressure vessels and heat exchangers for high-temperature, high-pressure hydrogen service. It applies to vessels that are designed, fabricated, certified, and documented in accordance with ASME BPVC, Section VIII, Division 1 or Division 2. This document may also be used as a resource for equipment fabricated using 1Cr-1/2Mo Steel. This document may also be used as a reference when planning to modify an existing heavy-wall pressure vessel. The interior surfaces of these heavy-wall pressure vessels may have an austenitic stainless steel or ferritic stainless steel weld overlay or cladding to provide additional corrosion resistance. For this recommended practice, the heavy wall is defined as a shell thickness of 2 in. (50 mm) or greater, but less than or equal to 4 in. (100 mm). Integrely reinforced nozzles, flanges, tubesheets, bolted channel covers, etc., can be greater than 4 in. (100 mm). At shell or head thicknesses greater than 4 in. (100 mm), 1 1/4Cr-1/2Mo have been shown to have difficulty meeting the toughness requirements given in this document. Although outside of the scope of this document, it can be used as a resource for vessels down to 1 in. (25 mm) shell thickness with changes defined by the purchaser. This recommended practice is not intended for use for equipment operating above 825 °F (441 °C) or in the creep range. Pages: 15

Product Number: C934C01 | Price: $107.00

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)—Russian

Russian translation of RP 934-C.

1st Edition | May 2008 | Product Number: C934C01R | Price: $86.00

TR 934-D
Technical Report on the Materials and Fabrication Issues of 1 1/4Cr-1/2Mo and 1Cr-1/2Mo Steel Pressure Vessels

Numerous 1 1/4Cr-1/2Mo and 1Cr-1/2Mo vessels have been constructed and successfully used in various applications in the petrochemical and chemical industries, in other types of service applications. These vessels have been constructed to the requirements of the ASME Boiler & Pressure Vessel Code, Section VIII, Divisions 1 and 2, and to various international pressure vessel codes and standards. The 1 1/4Cr-1/2Mo and 1Cr-1/2Mo vessels are typically used in severe service conditions (e.g., high temperature and/or high pressure hydrogen), which require high walls and cause in service deterioration. Such 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 intended properties. Corrosion protection by stainless steel weld overlay or cladding may also be required.

This report provides background information and guidance on the implementation of RP 934-C. In recent years it has been recognized that there are important distinctions that need to be considered for 1 1/4Cr-1/2Mo steels. Whereas RP 934-A continues to provide materials and fabrication requirements for new 2 1/4Cr-1Mo and 2 1/4Cr-1Mo-1/4V steel heavy wall pressure vessels in high temperature, high pressure hydrogen service, different material, and fabrication requirements have been developed for 1 1/4Cr-1/2Mo steel heavy wall pressure vessels. These requirements are covered in RP 934-C and 934-E. This document contains a description of key damage mechanisms that relate specifically to 1 1/4Cr-1/2Mo pressure vessels used in a variety of services. These damage mechanisms include elevated temperature damage such as “reheat cracking” or “creep embrittlement,” as well as other damage mechanisms that may occur at lower temperatures. This document provides information and guidance on successful practices for fabrication of 1 1/4Cr-1/2Mo steel heavy wall pressure vessels for the intended services of both RP 934-C and RP 934-E. The survey of steel producers and vessel fabricators (Annex 1) indicates that there is a need to evaluate the effect of heat treat cycles on materials properties (CVN toughness, tensile and yield strength). Pages: 56

1st Edition | September 2010
Product Number: C934D01 | Price: $135.00

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RP 934-E
Recommended Practice for Materials and Fabrication of 1 1/4Cr-1/2Mo Steel Pressure Vessels for Service Above 825 °F (440 °C)
Includes materials and fabrication requirements for new 1 1/4Cr-1/2Mo steel and 1Cr-1/2Mo pressure vessels and heat exchangers for high temperature service. It applies to vessels that are designed, fabricated, certified and documented in accordance with ASME BPVC 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 recommended practice is applicable to wall (shell) thicknesses from 1 in. (25 mm) to 4 in. (100 mm). Internally reinforced nozzles, flanges, tubesheets, bolted channel covers, etc. can be greater than 4 in. (100 mm). At shell or head thicknesses greater than 4 in. (100 mm), 1 1/4Cr-1/2Mo and 1Cr-1/2Mo have been shown to have difficulty meeting the toughness requirements given in this document, but this does not preclude the use of 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
Product Number: C934E01 | Price: $107.00

RP 934-E *
Recommended Practice for Materials and Fabrication of 1 1/4Cr-1/2Mo 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

RP 934-G
Design, Fabrication, Operational Effects, Inspection, Assessment, and Repair of Coke Drums and Peripheral Components in Delayed Coking Units
Includes information and guidance on the practices used by industry practitioners on the design, fabrication, operation, inspection, assessment, and repair of coke drums and peripheral components in delayed coking units. The guidance is general and does not reflect specific details associated with a design offered by licensors of delayed coking technology, or inspection tools, operating devices/components, repairs techniques, and/or engineering assessments offered by contractors. For details associated with the design offered by a licensor or services provided by contractors, the licensor or contractor should be consulted for guidance and recommendations for their design details and operating guidance. This document is a technical report and as such provides generally used practices in industry and is not an API recommended practice for coke drums in delayed coking units. Pages: 57
1st Edition | April 2016 | Product Number: C934G01 | Price: $150.00

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

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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 product forms within the scope are tubing, plate, sheet, forgings, pipe, and fittings for piping, vessel, exchanger, and tank applications. The Third Edition of this report has added castings and hot isostatically-pressed (HIP) components for pumps, valves, and other applications. The limited use of DSSs as a cladding is also briefly covered within the document. Pages: 59

Bull 939-E
Identification, Repair, and Mitigation of Cracking of Steel Equipment in Fuel Ethanol Service
Usage of fuel ethanol as an oxygenate additive in gasoline blends is increasing, both in the United States and internationally. This document discusses stress corrosion cracking (SCC) of carbon steel tanks, piping and equipment exposed to fuel ethanol as a consequence of being in the distribution system, at ethanol distribution facilities, or end user facilities where the fuel ethanol is eventually added to gasoline. Such equipment includes but is not limited to:
- storage tanks,
- piping and related handling equipment, and
- pipelines that are used in distribution, handling, storage, and blending of fuel ethanol.

However, data for pipelines in ethanol service is limited and caution should be used when applying guidelines from this document, which have been derived mainly from applications involving piping and tanks in ethanol storage and blending facilities. SCC of other metals and alloys is beyond the scope of this document, as is the corrosion of steel in this service. Pages: 42

The steels discussed in this RP resist high temperature hydrogen attack (HTHA) when operated within the guidelines given. However, they may not be resistant to other corrosives present in a process stream or to other metallurgical damage mechanisms that can occur in the operating HTHA range. This RP also does not address the issues surrounding possible damage from rapid cooling of the metal after it has been in high temperature, high pressure hydrogen service (e.g. possible need for outgassing hydroprocessing reactors). This RP will discuss in detail only the resistance of steels to HTHA.

Presented in this document are curves that indicate the operating limits of temperature and hydrogen partial pressure for satisfactory resistance of carbon steel and Cr-Mo steels to HTHA in elevated temperature, hydrogen service. In addition, it includes a summary of inspection methods to evaluate equipment for the existence of HTHA. Pages: 45
TR 942-A
Materials, Fabrication, and Repair Considerations for Hydrogen Reformer Furnace Outlet Pigtailed and Manifolds

Addresses materials, fabrication, and repair issues related to hydrogen and syngas reformer furnace outlet pigtailed and manifolds. High reliability of outlet pigtailed and manifold components, such as headers, tees, and fittings, is important to the successful long-term operation of hydrogen and syngas reformer furnaces. These components typically operate at high temperatures in the range of 750 to 950 °C (1382 to 1742 °F) where they are potentially subject to high-temperature creep, stress relaxation, hot corrosion, and thermal fatigue damage. In recent years a number of reformer furnace operators have encountered problems of in-service degradation and cracking of outlet pigtailed and manifold components, while others have had little or no problems of this type. Both direct experience in addressing specific cases of outlet pigtail and manifold cracking problems and indirect experience gained from surveying industry with regard to these problems were used in preparing this report. The objective of the project was to develop an understanding, based on published literature and industry experience, of why some reformer furnaces have had problems with embrittlement and cracking of outlet pigtailed and manifold components in service, while others have not had such problems. Pages: 53
1st Edition | June 2014 | Product Number: C942A01 | Price: $140.00

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 ensure 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
2-Year Extension: April 2013 | Product Number: C94503 | Price: $101.00

Publ 959
Characterization Study of Temper Embrittlement of Chromium-Molybdenum Steels

Evaluates the temper embrittlement characteristics of Cr.-Mo. pressure vessel steels. The steels are designated A387 in Part 4 of the ASTM Book of Standards. Most of the samples studied were of Grade 22 (2-1/4–1Mo) and a few samples of Grades 11 and 21 were also included, (1-1/4Cr-1/2Mo, 3Cr-1Mo). The 64 samples studied represented a wide range of commercially available steel, including qualification welds in 1-in. and 6-in. steel plate, large nozzle cut-outs, and randomly-shaped pieces of forging material. These materials received heat treatment typical of hydro-treater reactor fabrication. The objective of this program was to characterize typical commercial reactor steels and weldments in terms of toughness and other physical properties prior to being placed in service and the changes anticipated in toughness due to long-time service at elevated temperatures. It is important to note that the materials studied were typical of commercial production and fabrication up to about 1975 and are not representative of plate, forgings, and weld metal having low temper embrittlement susceptibility, generally available after 1975. Pages: 145
1st Edition | January 1982 | Product Number: C95900 | Price: $157.00

PUB 4261
Alcohols and Ethers: A Technical Assessment of Their Application as Fuels and Fuel Components

Summarizes information from the technical literature on producing and applying alcohols and ethers as fuels and fuel components for the transportation sector. It assesses the technical advantages and disadvantages of alcohols and ethers with respect to hydrocarbon fuels. Since the amendment of the Clean Air Act in 1977, and subsequently in 1990, public interest in the role of oxygenates in transportation has significantly increased. This edition of Publ 4261 has been updated and expanded to include a review of the oxygenate regulations and the technical literature that has been published since 1988. It provides a technical assessment suitable for policy discussions related to alcohols and ethers in transportation. Pages: 119
3rd Edition | June 2001 | Product Number: C42613 | Price: $162.00

Publ 4262
Methanol Vehicle Emissions

December 1990 | Product Number: F42620 | Price: $125.00

PROCESS SAFETY STANDARDS

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 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. This 3rd Edition of RP 752:2009 supersedes all previous editions, including the technical data provided in those documents. Significant research and development of technology pertinent to building sating 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. The 2nd Edition of RP 752 covered all building types both permanent and portable. This 3rd Edition of RP 752 does not cover portable buildings. Portable buildings are now covered by RP 753. 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

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 shut-down 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  |  Reaffirmed: January 2012
Product Number: K75301  |  Price: $141.00

RP 754
Process Safety Performance Indicators for the Refining and Petrochemical Industries

(ANSI/API RP 754)

Identifies leading and lagging process safety indicators useful for driving performance improvement. As a framework for measuring activity, status, or performance, this document classifies process safety indicators into four tiers of leading and lagging indicators. Tiers 1 and 2 are suitable for nationwide public reporting, and Tiers 3 and 4 are intended for internal use at individual facilities. Guidance on methods for development and use of performance indicators is also provided. This recommended practice (RP) was 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. To enable consistent application of this RP to other refining and petrochemical industry sub segments, informative annexes have been created to define the Applicability and Process definition for those subsegments. The user would substitute the content of those annexes for the referenced sections of this RP: Annex A—Petroleum Pipeline and Terminal Operation, Annex B—Retail Service Stations, and Annex C—Oil and Gas Drilling and Production Operations. Performance indicators identified in this recommended practice are based on the following guiding principles.

- Indicators should drive process safety performance improvement and learning.
- Indicators should be relatively easy to implement and easily understood by all stakeholders (e.g. workers and the public).
- Indicators should be statistically valid at one or more of the following levels: industry, company, and facility. Statistical validity requires a consistent definition, a minimum data set size, a normalization factor, and a relatively consistent reporting pool.
- Indicators should be appropriate for industry, company, or facility level benchmarking. Pages: 118

2nd Edition  |  April 2016  |  Product Number: K75402  |  Price: $150.00

RP 755
Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries

(ANSI/API RP 755)

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

TR 755-1

Identifies and explains the scientific and operational issues considered during the preparation of RP 755. By providing the reasoning behind the specific wording in the RP 755 document, this document supports each key statement in RP 755 in sequence so that it can be used in parallel with the RP 755 text. To make this document accessible and manageable, key scientific sources and references are provided to help readers gain access to the scientific literature.

Fatigue Risk Management Systems (FRMS) have emerged and been widely recognized as a more effective approach to managing and mitigating employee fatigue risk in the 24/7 workplace. The core feature of the FRMS is that it is a data-driven, risk-informed, safety performance-based system. The FRMS implementation process first identifies all sources of fatigue risk in the business operation, then introduces mitigating policies, technologies, and procedures to reduce the risk, and most importantly then maintains them in a proactively managed continuous improvement system. The history of FRMS was recently summarized.

This method represents a significant step change from the traditional approaches of either relying on maximum limits to hours of work or minimum limits to hours of rest (variously called Hours of Service, Work-Rest Rules,
Refining

Working Time Directives, or adopting intermittent or piece-meal solutions (e.g., a fatigue training program or a shift schedule redesign), depending on the interests and initiative of local site managers.

One essential feature of FRMS is that it is a system meant to be improved upon on a regular and continuous basis. It is not a set of guidelines designed for one-time compliance but instead provides a framework that will evolve over time, driven by the collection of data on fatigue risk and fatigue outcomes (e.g., fatigue-related incidents). Pages: 49

1st Edition | April 2010 | Product Number: K755101 | Price: $103.00

RP 756
Management of Hazards Associated with Location of Process Plant Tents

Provides guidance for managing the risk from explosions, fires and toxic material releases to on-site personnel located in tents. The term “tent” is used to describe a wide range of structures and is defined in §3.15. This RP was developed for use at refineries, petrochemical and chemical operations, natural gas liquids extraction plants, natural gas liquefaction plants, and other onshore facilities covered by OSHA 29 CFR 1910.119.

The focus of this RP is primarily on process related hazards. However, non-process related hazards may exist which could present risks to tent occupants. Previous accidents have demonstrated that tent occupants are susceptible to injuries from fires originating inside the tent, from tent collapse due to extreme weather, and from falling objects. Some of these hazards are addressed by tent design standards, manufacturer’s recommendations, and local regulations. Pages: 25

1st Edition | September 2014 | Product Number: C756001 | Price: $125.00

TR 756-1
Process Plant Tent Responses to Vapor Cloud Explosions—Results of the American Petroleum Institute Tent Testing Program

Beginning in 2011, the American Petroleum Institute (API) performed vapor cloud explosion (VCE) tests to determine the response of tents to the potential explosion hazards that may be present at refineries, petrochemical and chemical operations, natural gas and other onshore processing facilities covered by OSHA 29 CFR 1910.119. The testing was conducted to provide data for use by the API committee developing RP 756. This publication, TR 756-1, contains information on the results of the API tent testing program. Pages: 597

1st Edition | September 2014 | Product Number: C756101 | Price: $190.00

HEALTH, ENVIRONMENT, AND SAFETY: GENERAL

Cumulative Impact of Environmental Regulations on the U.S. Petroleum Refining, Transportation and Marketing Industries

1st Edition | Product Number: C00015 | available at www.api.org

RP 751
Safe Operation of Hydrofluoric Acid Alkylation Units

The refining industry has long demonstrated that HF acid alkylation units can be operated safely and responsibly. Like many industrial processes, the HF alkylation process presents operational risk and must be properly designed, well-maintained and operated to assure safe operation. RP 751 is an industry document that communicates proven industry practices to support the safe operation of an HF acid alkylation unit. The philosophy of this 4th Edition is to build on the previous editions’ base of recommendations for HF acid leak prevention, detection, and mitigation with the document section topics of hazard management, operating procedures and worker protection, material inspection and maintenance, transportation and inventory control, relief and utility systems, and risk mitigation. This edition changes some previous provisions from recommendations (should) to requirements (shall) based on regulatory requirements, broad industry acceptance and proven efficacy for industry practices along with the addition of some new recommendations and requirements. The recommendations presented in the document are those that have been found effective or those which are advised for safe operations. Pages: 67

4th Edition | May 2013 | Product Number: K75104 | Price: $150.00

Std 2350
Overfill Protection for Storage Tanks in Petroleum Facilities (ANSI/API Std 2350)

Applies to storage tanks associated with marketing, refining, pipeline, and terminals operations and with tanks containing Class I or Class II petroleum liquids and for Onshore storage liquids. This standard addresses overfill protection for petroleum storage tanks. It recognizes 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 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. The fourth edition continues to build on experience and new technology through the use of management systems. Since operations are the primary overfill prevention safeguard, new definitions and requirements are established for alarms. Risk reduction is also addressed by current and generally accepted industry practices.

The essential elements of this document are based on current industry safe operating practices and existing consensus standards. Federal, state, and local regulations or laws may contain additional requirements for tank overfill protection programs. For existing facilities, the results of a risk-based analysis of aboveground atmospheric petroleum storage tanks may indicate the need for more protection against overfilling. In such cases, some provisions from this standard may be suitable.

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 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. Pages: 47

4th Edition | May 2012 | Product Number: K235004 | Price: $114.00

HEALTH, ENVIRONMENT, AND SAFETY: SOIL AND GROUNDWATER

Groundwater Protection Programs for Petroleum Refining and Storage Facilities: A Guidance Document

Reflects continuing industry action and commitment to positively address groundwater protection by developing and implementing individual groundwater protection plans. Provides additional guidance to help petroleum facilities identify the types of issues that may need to be addressed in a groundwater protection plan. Intended to help refineries, terminals associated with transportation pipelines, product distribution terminals, and other downstream petroleum storage units develop groundwater protection plans that are tailored to their individual circumstances. Pages: 9

1st Edition | October 1994 | Product Number: C42201 | Price: $65.00

Lit Survey: Subsurface and Groundwater Protection Related to Petroleum Refinery Operations

This report is the principal product of an API-sponsored project to prepare a background basis for the development of further information on subsurface and groundwater protection at refineries. It contains an explanation of how the literature survey was conducted; annotations for pertinent articles; a discussion of applicable federal statutes and regulations; and annotations for pertinent regulatory programs under the 5 principal statutes that apply to refinery operations. Pages: 145

1st Edition | September 1988 | Product Number: C80000 | Price: $92.00
API Standard for Third Party Network Connectivity

Provides guidance for implementing secure third-party connections between the information technology systems and network of two companies that have a business relations and a common objective. The standard will provide suggestions for companies to establish third-party network connections while protecting their individual systems and data from unauthorized access or manipulation. Pages: 36
1st Edition | November 2007 | Product Number: TISP01 | 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

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

Std 780
Security Risk Assessment Methodology for the Petroleum and Petrochemical Industries

Prepared by a Security Risk Assessment (SRA) Committee of the American Petroleum Institute (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

This publication is a new entry in this catalog.
This publication is related to an API licensing, certification, or accreditation program.
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 highlight industry recommended practices for well construction and integrity for wells that will be hydraulically fractured. The guidance provided here will help to ensure that shallow groundwater aquifers

and the environment will be protected, while also enabling economically viable development of oil and natural gas resources. This document is intended to apply equally to wells in either vertical, directional, or horizontal configurations. Maintaining well integrity is a key design principle and design feature of all oil and gas production wells. Maintaining well integrity is essential for the two following reasons.

- 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.
- 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 | June 2011 | Product Number: GHF301 | Price: $42.00
You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

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: 26

1st Edition | June 2010 | Product Number: GHF201 | Price: $42.00
You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

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
You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

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

Provides recommendations that 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

3rd Edition | May 2001 | Reaffirmed: January 2013
Product Number: G49003 | Price: $88.00

RP 49 *
Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide—Kazakh

Kazakh translation of RP 49.

3rd Edition | May 2001 | Product Number: G4903K | Price: $71.00

RP 49 *
Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide—Russian

Russian translation of RP 49.

3rd Edition | May 2001 | Product Number: G04903R | Price: $68.00

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

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

Product Number: GS1R01 | Price: $76.00
You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

* 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.
RR 67  Recommended Practice for Oilfield Explosives Safety—Kazakh
Kazakh translation of RR 67.
3rd Edition | May 2007 | Product Number: G06702K | Price: $68.00

RR 67 * Recommended Practice for Oilfield Explosives Safety—Russian
Russian translation of RR 67.
2nd Edition | May 2007 | Product Number: G06702R | Price: $69.00

RR 74 Recommended Practice for Occupational Safety for Onshore Oil and Gas Production Operation
Recommends practices and procedures for promoting and maintaining safe working conditions for personnel engaged in onshore oil and gas production operations, including special services. Pages: 23
1st Edition | October 2001 | Reaffirmed: January 2013
Product Number: G74001 | Price: $61.00

RR 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 (SEMP) for oil, gas, and sulphur operations and facilities located on the outer continental shelf (OCS). These guidelines are applicable to well drilling, servicing, and production; and pipeline facilities and operations that have the potential for creating a safety or environmental hazard at OCS platform sites. Eleven major program elements are included for application to these facilities and operations. Identification and management of safety and environmental hazards are addressed in design, construction, startup, operation, inspection, and maintenance of new, existing, and modified facilities. Pages: 41
3rd Edition | May 2004 | Reaffirmed: January 2013
Product Number: G07503 | Price: $89.00

RR 75 * Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities—Chinese
Chinese translation of RR 75.
3rd Edition | May 2004 | Product Number: G07503C | Price: $63.00

Bull 75L Guidance Document for the Development of a Safety and Environmental Management System for Onshore Oil and Natural Gas Production Operations 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

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To protect the safety of their workforces and the general public. When they provide safe work places and to protect the safety of their work places and operations are carried out in a safe manner. Operators and contractors need and/or operator personnel and/or equipment at risk. It is important that activities of contractors have the potential to take place either contractor well servicing, equipment repair, maintenance, and construction. Certain activities such as drilling rigs is not specifically addressed. Pages: 14

**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. Pages: 14
Management systems equivalent to the criteria outlined in this document. Contractors involved in process safety sensitive actions shall have fatigue risk
Applies to all employees working night shifts, rotating shifts, extended hours/job location.

OSHA Process Safety Management Standard, 29 CFR 1910.119, or similar national and international regulations. To enable consistent application of this RP to other refining and petrochemical industry sub segments, informative annexes have been created to define the Applicability and Process definition for those subsegments. The user would substitute the content of those annexes for the referenced sections of this RP: Annex A—Petroleum Pipeline and Terminal Operation, Annex B—Retail Service Stations, and Annex C—Oil and Gas Drilling and Production Operations. Performance indicators identified in this recommended practice are based on the following guiding principles:

- Indicators should drive process safety performance improvement and learning.
- Indicators should be relatively easy to implement and easily understood by all stakeholders (e.g. workers and the public).
- Indicators should be statistically valid at one or more of the following levels: industry, company, and facility. Statistical validity requires a consistent definition, a minimum data set size, a normalization factor, and a relatively consistent reporting pool.
- Indicators should be appropriate for industry, company, or facility level benchmarking.

These recommendations include the development of FRMS that are data-driven, risk-informed, safety performance-based systems. The FRMS implementation process first identifies all sources of fatigue risk in the business operation, then introduces mitigating policies, technologies, and procedures to reduce the risk, and most importantly maintains them in a proactively managed continuous improvement system. The history of FRMS was recently summarized.

This method represents a significant step change from the traditional approaches of either relying on maximum limits to hours of work or minimum limits to hours of rest (variously called Hours of Service, Work-Rest Rules, Working Time Directives), or adopting intermittent or piece-meal solutions (e.g., a fatigue training program or a shift schedule redesign), depending on the interests and initiative of local site managers.

One essential feature of FRMS is that it is a system meant to be improved upon on a regular and continuous basis. It is not a set of guidelines designed for one-time compliance but instead provides a framework that will evolve over time, driven by the collection of data on fatigue risk and fatigue outcomes (e.g., fatigue-related incidents).

Identification of leading and lagging process safety indicators useful for driving performance improvement. As a framework for measuring activity, status, or performance, this document classifies process safety indicators into four tiers: leading and lagging indicators. Tiers 1 and 2 are suitable for nationwide public reporting, and Tiers 3 and 4 are intended for internal use at individual facilities. Guidance on methods for development and use of performance indicators is also provided. This recommended practice (RP) was 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. To enable consistent application of this RP to other refining and petrochemical industry sub segments, informative annexes have been created to define the Applicability and Process definition for those subsegments. The user would substitute the content of those annexes for the referenced sections of this RP: Annex A—Petroleum Pipeline and Terminal Operation, Annex B—Retail Service Stations, and Annex C—Oil and Gas Drilling and Production Operations. Performance indicators identified in this recommended practice are based on the following guiding principles:

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<tr>
<td>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</td>
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<tr>
<td>1st Edition</td>
<td>March 2001</td>
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<tr>
<th><strong>Std 780</strong></th>
<th>Security Risk Assessment Methodology for the Petroleum and Petrochemical Industries</th>
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<td>Prepared by a Security Risk Assessment (SRA) Committee of the American Petroleum Institute (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</td>
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<td>1st Edition</td>
<td>May 2013</td>
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<tr>
<th><strong>RP 2001</strong></th>
<th>Fire Protection in Refineries</th>
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<td>Covers basic concepts of refinery fire protection. It reviews the chemistry and physics of refinery fires; discusses how the design of refinery systems and infrastructure impact the probability and consequences of potential fires; describes fire control and extinguishing systems typically used in refineries; examines fire protection concepts that should be covered in operating and maintenance practices and procedures; and provides information on organization and training for refinery emergency responders. Many of the concepts, systems and equipment discussed in this document are covered in detail in referenced publications, standard or governmental requirements. Pages: 75</td>
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<td>9th Edition</td>
<td>April 2012</td>
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<th><strong>RP 2003</strong></th>
<th>Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents</th>
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<td>Presents the current state of knowledge and technology in the fields of static electricity, and stray currents applicable to the prevention of hydrocarbon ignition in the petroleum industry and is based on both scientific research and practical experience. The principles discussed in this recommended practice are applicable to other operations where ignitable liquids and gases are handled. Their use should lead to improved safety practices and evaluations of existing installations and procedures. Pages: 76</td>
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<td>8th Edition</td>
<td>September 2015</td>
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<th><strong>RP 2009</strong></th>
<th>Safe Welding, Cutting, and Hot Work Practices in the Petroleum and Petrochemical Industries</th>
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<tr>
<td>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</td>
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<td>Product Number: K20097</td>
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<th><strong>RP 2027</strong></th>
<th>Ignition Hazards Involved in Abrasive Blasting of Atmospheric Storage Tanks in Hydrocarbon Service</th>
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<td>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</td>
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<th><strong>RP 2028</strong></th>
<th>Flame Arresters in Piping Systems</th>
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<tr>
<td>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</td>
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<td>3rd Edition</td>
<td>February 2002</td>
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<td>2-Year Extension: February 2015</td>
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<td>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: 21</td>
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<td>4th Edition</td>
<td>September 2014</td>
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<th><strong>RP 2201</strong></th>
<th>Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries</th>
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<td>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</td>
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<td>2-Year Extension: February 2015</td>
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<th><strong>RP 2210</strong></th>
<th>Flame Arresters for Vents of Tanks Storing Petroleum Products</th>
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<td>Discusses the benefits and detriments associated with the use of flame arresters on vents utilized on atmospheric fixed-roof tanks. Pages: 4</td>
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<td>Product Number: K22103</td>
<td>Price: $65.00</td>
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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 sprayed 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
Product Number: K22163 | Price: $59.00

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 (PRCS) entry. Std 2217A applies to confined spaces that have been intentionally purged with an inert gas until:
- the oxygen level in the vapor space is too low to support combustion, and
- any gases in or flowing out of the confined space are below flammable or reactive levels.
Typical inert entry work in the petroleum and petrochemical industry includes work to service or replace catalyst in reactors. Pages: 25
Product Number: K2217A4 | Price: $88.00

RP 2218
Fireproofing Practices in Petroleum and Petrochemical Processing Plants
Intended to provide 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 RP identifies fireproofing needs for petroleum and petrochemical plants specifically focusing on property loss protection for pool fires in on-shore processing plants. Pages: 60
3rd Edition | July 2013 | Product Number: K22183 | Price: $160.00

RP 2219
Safe Operation of Vacuum Trucks Handling Flammable and Combustible Liquids in Petroleum Service
Provides information concerning the safe operation of vacuum trucks engaged in all aspects of handling flammable and combustible liquids, associated waste water, produced water, sour water, basic sediment and water (BS&W), caustics, spent acids, or other fluids stemming from petroleum operations, products, powders, and the hazard of dust explosions. This publication discusses the types of vacuum pumps and cargo tanks associated with vacuum truck operations, the common hazards associated with those vacuum truck operations, and representative safe work practices and precautions to help prevent accidents and injuries. Appendix G provides brief descriptions of a variety of incidents involving vacuum trucks, including offloading into open areas. These may be useful in reviewing specific operating procedures or developing materials for safety meetings or pre-job briefings. Pages: 60
4th Edition | June 2016 | Product Number: K22194 | Price: $165.00

Std 2220
Contractor Safety Performance Process
Assists 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

Std 2220 *
Contractor Safety Performance Process—Chinese
Chinese translation of Std 2220.
3rd Edition | October 2011 | Product Number: K222003C | Price: $64.00

RP 2221
Contractor and Owner Safety Program Implementation
Many facilities in the refining and petrochemical processing industries employ contractor personnel for a wide range of activities, from administrative support to equipment repair, maintenance, and construction. Contractor activities that involve work in or around process equipment can have an increased potential to place both contractor personnel and owner personnel at risk.
This guide is intended to assist refining and petrochemical industry facility owners and contractors to implement (or improve) an effective contractor health and safety program. In the petroleum segment, RP 2221 applies to downstream activities only. This includes refineries, pipelines, and marketing and distribution terminals, but not exploration and production or marine.
This document provides guidance for applying the principles outlined in RP 2220. Security issues maintain a high profile in all aspects of industry, including the contractor screening and selection process; however, security is outside the scope of this standard and is mentioned as a reminder of the need for many facilities to include security in their contractor processes. This publication intends to preserve the independent contractor relationship while helping both owners and contractors improve contractor safety performance. It is based on experience in the petroleum and petrochemical industries and experience of firms that perform contract work for these industries. Since owner facilities, equipment, sites, and contracted work are diverse, this publication may not be applicable to operations at all facilities or to all contract work performed in these operations. This publication may not apply

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Safety and Fire Protection

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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
This annual summary reports on cases recordable in 2005 under the U.S. Bureau of Labor Statistics' record keeping guidelines. The survey is based on data submitted to the American Petroleum Institute by oil and gas companies. The report includes information regarding injuries, illnesses, and fatalities, lost workday cases, and incidence rates by function.
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
Reports on cases recordable in 2009 under the U.S. Bureau of Labor Statistics' record keeping guidelines. The survey is based on data submitted to API by oil and gas companies. The report includes information regarding injuries, illnesses, and fatalities, lost workday cases, and incidence rates by function.
April 2010 | Product Number: K23881 | Price: $103.00

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

This publication is related to an API licensing, certification, or accreditation program.
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 2510A  
Fire Protection Considerations for the Design and Operation of Liquefied Petroleum Gas (LPG) Storage Facilities  
Supplements Std 2510 and addresses the design, operation, and maintenance of liquefied petroleum gas (LPG) storage facilities from the standpoint of prevention and control of releases, fire protection design, and fire control measures. The history of LPG storage facility safety experience, facility design philosophy, operating and maintenance procedures, and various fire protection and fire-fighting approaches are presented. The storage facilities covered are LPG installations (storage vessels and associated loading/unloading/transfer systems) at marine and pipeline terminals, natural gas processing plants, refineries, petrochemical plants, and tank farms. Pages: 45

Product Number: K2510A | Price: $101.00

STORAGE TANK SAFETY STANDARDS

Std 2015  
Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks  
Applies to stationary atmospheric and low-pressure (up to and including 15 psig) aboveground petroleum storage tanks used in all sectors of the petroleum and petrochemical industry, including:
- crude oil and gas production,
- refining; petrochemicals,
- pipelines and terminals,
- bulk storage, and
- ethanol facilities.

This standard provides requirements for safely planning, coordinating, and conducting tank entry and cleaning operations, removal from service through return to service. This standard does not and cannot cover every possible unique hazard or situation that may arise during tank cleaning operations. Site, product and tank-specific hazards and situations must be addressed by employers using the appropriate principles and considerations provided for by this standard. Pages: 60

7th Edition | May 2014 | Product Number: K20157 | Price: $150.00

RP 2021  
Management of Atmospheric Storage Tank Fires  
Provides experience-based information to enhance the understanding of fires in atmospheric storage tanks containing flammable and combustible materials. It presents a systematic management approach that can assist in 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

Product Number: K20214 | Price: $134.00

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

Product Number: K20233 | Price: $110.00

Publ 2026  
Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service  
Provides safety information for individuals responsible for performing maintenance or repairs that involve descent onto the floating roofs of petroleum storage tanks. Pages: 15

Product Number: K20262 | Price: $62.00

RP 2207  
Preparing Tank Bottoms for Hot Work  
Addresses only the safety aspects of hot work on petroleum storage tank bottoms. It discusses safety precautions for preventing fires, explosions, and associated injuries. The term “hot work,” as used in this publication, is defined as an operation that can produce a spark or flame hot enough to ignite flammable vapors. Pages: 32

Product Number: K22076 | Price: $86.00

Std 2350  
Overfill Protection for Storage Tanks in Petroleum Facilities (ANSI/API Std 2350)  
Applies to storage tanks associated with marketing, refining, pipeline, and terminals operations and with tanks containing Class I or Class II petroleum liquids and use is recommended for Class III petroleum liquids. This standard addresses overfill protection for petroleum storage tanks. It recognizes that protection provides the most basic level of protection, thus while using both terms “protection” and “prevention,” the document emphasizes prevention. The standard’s scope covers 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. The fourth edition continues to build on experience and new technology through the use of management systems. Since operations are the primary overfill prevention safeguard, new definitions and requirements are established for alarms. Risk reduction is also addressed by current and generally accepted industry practices.

The essential elements of this document are based on current industry safe operating practices and existing consensus standards. Federal, state, and local regulations or laws may contain additional requirements for tank overfill protection programs. For existing facilities, the results of a risk-based analysis of aboveground atmospheric petroleum storage tanks may indicate the need for more protection against overfilling. In such cases, some provisions from this standard may be suitable.
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 does not apply to: underground storage tanks; aboveground tanks of 1320 U.S. gallons (5000 liters) or less; aboveground tanks that 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. Pages: 47
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: 807


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: I00076 | 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: I00141 | 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
### Health and Environmental Issues

**Publ 348**  
*Air Toxics Emission Factors for Combustion Sources Using Petroleum-Based Fuels, Volume 1—Development of Emission Factors Using API/WSPA Approach*

This project was performed with the cooperation of the California Air Resources Board (CARB) and Western States Petroleum Association to develop updated air toxics emission factors for combustion sources using petroleum-based fuels. The emission factors developed using the best available source testing information in this project will help the U.S. Environmental Protection Agency to revise AP-42. In addition, the emission factors will be integrated into CARB's California Air Toxics Emission Factor database. Environmental, health, and safety engineers can use these emission factors to develop more accurate and complete emission inventories without additional source testing, which could help facilities in the permitting process. Pages: 88

August 1998 | Product Number: J34800 | Price: $100.00

**Publ 4653**  
*Fugitive Emission Factors for Crude Oil and Product Pipeline Facilities*

Presents the results of a study to determine equipment component fugitive emission factors for crude oil and product pipeline facilities. The emission factors presented in this report will allow pipeline operators to estimate total hydrocarbon emissions from equipment components located at pipeline facilities in light crude service, heavy crude service, and product service. Pages: 50

June 1997 | Product Number: I46530 | Price: $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 (PM2.5). Source emissions data are needed to assess the contribution of petroleum industry combustion sources to ambient PM2.5 concentrations. This report presents particulate measurement results from a 114 million British thermal unit (MMBtu) per hour gas-fired refinery process heater. The particulate stack measurements were made using both a dilution tunnel research test method and traditional EPA sampling methods. 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 (PM2.5). Source emissions data are needed to assess the contribution of petroleum industry combustion sources to ambient PM2.5 concentrations. This report presents particulate measurement results from a 114 million British thermal unit (MMBtu) per hour gas-fired refinery process heater. The particulate stack measurements were made using both a dilution tunnel research test method and traditional EPA sampling methods. 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 (PM2.5). Source emissions data are needed to assess the contribution of petroleum industry combustion sources to ambient PM2.5 concentrations. This report presents that the gas fired steam generator has a maximum heat input of 62.5 MMBtu/hr with an average rate of approximately 50 MMBtu/hr. 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 PM2.5 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 PM2.5 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

**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, diagenic, 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
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 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 of oil and gas sampling results and emissions modeling results for more than 100 crude oil E&P storage tanks. Correlation equations or statistical averages were recommended to estimate Reid Vapor Pressure, vented flash gas molecular weight, vented working and standing gas molecular weight, hydrocarbon speciation (including hazardous air pollutants), and separator gas specific gravity. Pages: 82
December 1998 | Product Number: I46830 | Price: $79.00

Publ 4697
Production Tank Emissions Model (E&P TANK, Version 3.0)
E&P TANKS (API Publ 4697) is a computer-based software designed to use site-specific information to predict emission from petroleum production storage tanks, now compatible with 32-bit and 64-bit Windows 7 as well as Windows 2000/XP/Vista. It estimates flashing, working, and standing losses and calculates losses using specific operations for each user’s tank. Cited by the Environmental Protection Agency (EPA), it allows the user to enter specific tank condition information to generate air emission reports. Visit www.uptanks.com for pricing and information.

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 310
Analysis of Refinery Screening Data
Analyzes 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 of 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® for Windows® environment. The model allows the user to sum up the emissions from a refinery process unit area or from the entire refinery. The model user can quickly and easily predict the contribution of process drain emissions to the total emission inventory of a refinery. Unit operators can use the output generated by the software for regulatory reporting according to the requirements of the Clean Air Act Amendments of 1990. The minimum system requirements for running APIDRAIN Version 1.0 are PC 486 DX2 Windows® 3.11 platform, 8 MB RAM, and Windows 95®/Windows NT®. The user must have Windows® and Excel® installed on a personal computer to begin using the software. The APIDRAIN model is enhanced with automatic functions that enable the user to easily summarize important reporting information and to generate tabular emissions totals for both specific refinery process units and for the entire refinery. It is not necessary for the user to possess a rigorous understanding of Excel® to use APIDRAIN; only a few common principles of the Windows® operating environment are needed (such as point-and-click and navigation of tab and arrow keys). See also 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 flue gas including condensable aerosols), especially organic aerosols from gas-fired combustion devices, and
- identify and characterize secondary particulate (i.e. particulate formed via reaction of stack emissions in the atmosphere) precursor emissions.
This report presents the results of a pilot project to evaluate the test protocol on a refinery fluid catalytic cracking unit. 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 nor 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 analysis 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 overpredicting 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 perimeter, 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 (GTAW or TIG), oxyfuel gas cutting (OFC or torch cutting), and shielded metal arc welding (SMAW or stick). After the First Edition of this report was published, it was determined that 15 samples from one of the projects were listed as carbon steel base metal and should have been listed as stainless steel. While the original report was careful to point out the use of electrodes typical for stainless work, it was felt that a complete update was needed. Eighty-three samples were collected in October and November 2005 at two petroleum sites during maintenance turnarounds by API member companies. An additional 188 samples were collected April–June 2006 at three different petroleum company sites by ICI Environmental Health and Safety. Of the 271 total samples, 63 samples were at or above the Occupational Safety and Health Administration (OSHA) action level of 2.5 μg/m³ and 51 were at or above the OSHA permissible exposure limit of 5 μg/m³. Pages: 12

June 2007 | Product Number: I46290 | Price: $85.00
Health and Environmental Issues

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Online Orders: global.ihs.com

MODELING

Publ 4546
Contains an evaluation of a group of 14 hazardous gas dispersion models. All available measurement programs were considered for the evaluation, covering both the releases of dense gases and nondense tracer gases; eight data sets are used in the evaluation. The models are reviewed for their scientific validity. Statistical procedures and residual plots are used to characterize performance. A number of the models give predictions that reasonably match field data. Pages: 351
October 1992 | Product Number: J45460 | 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. Pages: 212
November 1996 | Product Number: J46280 | 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. Pages: 311
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. Pages: 156
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. Pages: 240
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. Pages: 364
September 1994 | Product Number: J46160 | 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 surveys 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: K19986 | 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

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
Health and Environmental Issues

**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 activities such as drilling rigs is not specifically addressed. Pages: 71

2nd Edition | October 2005 | Product Number: I0HF02 | Price: $149.00

**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. Pages: 14

1st Edition | February 2006 | Product Number: I0HF03 | Price: $62.00

**TR 400**
**Toluene: A Preliminary Study of the Effect of Toluene on Pregnancy of the Rat**
Describes a preliminary experiment performed on the pregnant rat to determine appropriate exposure levels of toluene, for future investigation of embryofetal toxicity in the rat when administered via the inhalation route from days 5 to 15 of pregnancy inclusive. The inhalation route of administration was chosen as the most likely route of exposure in humans. The exposure levels were chosen following a review of currently available information. See related document TR 401. Pages: 113

June 1993 | Product Number: I00400 | Price: $61.00

**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. 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

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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.
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 B6C3F1 mice at concentrations of 0, 900, 3000 and 9000 ppm in air. Summary text and pertinent data on differences in survivorship between control and exposed groups, changes in body weight, and pathology are provided. The table of contents to the unabridged final report is included. 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 valuable 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 quantitation 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: 48

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

**Publ 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 differentiate between a sample containing the odorant and a sample of odor-free air. The recognition threshold is the minimum concentration at which 50 % of a given population can recognize the odorant. The addition of 11 % to 15 % by volume MTBE or 15 % by volume of TAME or ETBE reduce the odor detection and recognition thresholds of gasoline. Pages: 76

January 1994 | Product Number: I45920 | Price: $79.00

**Publ 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

**Publ 4634**

Index and Abstracts of API Health-Related Research

This compendium of health-related research provides author, organization, and subject indices for research investigations and scientific reviews conducted for API between 1959 and 1994. It covers industrial hygiene and exposure assessment, toxicology, environmental biology, product safety, and community and occupational health research areas. Informative abstracts provide useful background on each study and give information on publication availability. Pages: 160

September 1995 | Product Number: I46340 | Price: $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 scheduled to approximate occupational exposure for up to 42 days. During and after exposure, the concentration of GFAP was determined in four brain regions and compared with standard criteria of neurotoxicity: behavioral or neuropathological changes. Pages: 44

June 1997 | Product Number: I46470 | Price: $79.00
Text may be downloaded onto a diskette and stored as a file or printed. Users need 640 KB RAM, DOS 2.0 or higher, and at least a 2 MB hard disk.

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 and oil products in aquatic environments. Some 748 toxicity values for fish, invertebrates, and algae are assembled into a database—OILTOX. LC50 values can be identified as well as information on taxonomic groups and toxicity endpoints of interest. Key methodological aspects of toxicity tests can be made as well as determinations of which test procedures have a significant impact on results. Users need 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: 196

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 quantification 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 Processing Units

Demonstrates the application of pollution prevention concepts in the design of a refinery crude processing unit. Included are realistic waste and emission reduction changes that would be economically and technically attractive to refiners. The document is intended to serve as a reference for refinery designers during the preliminary design phase of building a new crude unit or revamping an existing crude unit. Pages: 214
February 1993 | Product Number: J31100 | Price: $148.00

Publ 31101
Executive Summary: Environmental Design Considerations for Petroleum Refining Crude Processing Units

Executive summary to Publ 311. Pages: 13
February 1993 | Product Number: J31101 | Price: $58.00

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 report 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

Presents methods that can be used to measure progress toward pollution prevention. It investigates a series of measurement parameters presented in five categories: program-based, activity-based, mass-based, normalized, efficiency, and concentration-based. Within each category of measures, the benefits and limitations are discussed and illustrated with industry examples. Pages: 30
September 1994 | Product Number: J33100 | Price: $63.00

Publ 333
Generation and Management of Residual Materials

This report is the fifth in a series of reports detailing waste and residual management practices in the refining sector. It presents the results of the 1992–1993 survey and includes information on how the industry has achieved compliance with the land disposal restrictions on 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

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 Vadose 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

Bulletin No. 15
Vadose Zone Natural Attenuation of Hydrocarbon Vapors: An Empirical Assessment of Soil Gas Vertical Profile Data
December 2001

Bulletin No. 16
Migration of Soil Gas Vapors to Indoor Air: Determining Vapor Attenuation Factors Using a Screening-Level Model and Field Data from the CDOT-MTL
April 2002

Bulletin No. 17
Identification of Critical Parameters for the Johnson and Ettinger (1991) Vapor Intrusion Model
May 2002

Bulletin No. 18
Answers to Frequently Asked Questions About Managing Risk at LNAPL Sites
May 2003

Bulletin No. 19
Evaluation of Small-Volume Releases of Ethanol-Blended Gasoline at UST Sites
October 2003
Health and Environmental Issues

Fax Orders: +1 303 397 2740

Bulletin No. 20
Answers to Frequently Asked Questions About Ethanol Impacts to Groundwater
December 2003

Bulletin No. 21
Evaluation of Potential Vapor Transport to Indoor Air Associated with Small-Volume Releases of Oxygenated Gasoline in the Vadose Zone
January 2005

Bulletin No. 22
Maximum Potential Impacts of Tertiary Butyl Alcohol (TBA) on Groundwater from Small-Volume Releases of Ethanol-Blended Gasoline in the Vadose Zone
January 2005

Bulletin No. 23
The Impact of Gasohol and Fuel-Grade Ethanol on BTX and Other Hydrocarbons in Ground Water: Effect on Concentrations Near a Source
December 2005

Bulletin No. 24
Downward Solute Plume Migration: Assessment Significance and Implications for Characterization and Monitoring of “Diving Plumes”
April 2006

Bulletin No. 25
Remediation Progress at California LUFT Sites: Insights from the GeoTracker Database
February 2012

Bulletin No. 26
Tertiary Butyl Alcohol (TBA) Biodegradation: Some Frequently Asked Questions
March 2012

CONTAMINANT FATE AND TRANSPORT

Publ 4531
Chemical Fate and Impact of Oxygenates in Groundwater: Solubility of BTEX from Gasoline-Oxynate Mixtures
Oxygenated hydrocarbon compounds may be added to gasoline mixtures to improve emission quality and octane ratings or to conserve petroleum resources, which may alter the behavior of dissolved organic compounds in groundwater following a fuel spill. This study evaluates the effects of oxygenate additives such as methanol or methyl tertiary-butyl ether on the aqueous solubility of dissolved aromatic hydrocarbons (benzene, toluene, ethylbenzene, and the isomers of xylene, collectively referred to as BTEX) from gasoline. It also explores the nature of the dissolved contaminant plumes that could develop from a spill of gasoline containing methanol.
Pages: 110
August 1991 | Product Number: I45310 | Price: $61.00

Publ 4593
Transport and Fate of Non-BTEX Petroleum Chemicals in Soils and Groundwater
This literature survey documents available information on the chemical composition of petroleum products and the subsurface fate and transport of selected non-BTEX (benzene, toluene, ethylbenzene, and xylenes) constituents of these products. The evaluation focuses on a representative group of 12 hydrocarbons and hetero-organic compounds based on their abundance in petroleum products and anticipated future interest from regulatory agencies.
Pages: 200
September 1994 | Product Number: I45930 | Price: $65.00

Publ 4601
Transport and Fate of Dissolved Methanol, MTBE and Monoaromatic Hydrocarbons in a Shallow Sand Aquifer
Describes a field investigation into the effect of oxygenates methanol and methyl tertiary-butyl ether (MTBE) on the fate and transport of benzene, toluene, ethylbenzene, and xylenes (BTEX) in groundwater. Natural gradient tracer experiments were conducted to simulate the transport of dissolved plumes resulting from subsurface releases of oxygenated fuels. In these experiments, methanol, MTBE, and BTEX concentrations were monitored by sampling from a dense network of multilevel piezometers, and plume contours were mapped through application of moment analysis. A laboratory study on the effects of methanol and MTBE on the biodegradation of BTEX in groundwater was also conducted. The relative mobility and persistence of BTEX and the oxygenates were characterized based on field and laboratory study data. Pages: 338
April 1994 | Product Number: I46010 | Price: $123.00

Publ 4627
Reviews more than 200 technical articles published between 1988 and 1991 in the area of on-site and in-situ bioremediation of petroleum hydrocarbons. It focuses specifically on current field and laboratory research related to petroleum hydrocarbon biodegradation including biodegradation of crude oil and solvents. Recent work in fate and transport modeling that can be applied to petroleum hydrocarbon contamination in groundwater is also covered. The review is designed to complement an earlier (pre-1988) review published by the U.S. Navy.
Pages: 146
June 1995 | Product Number: I46270 | Price: $61.00

Publ 4633
Barium in Produced Water: Fate and Effects in the Marine Environment
Provides a summary of what is currently known about the physical and chemical behavior of barium in produced water and in the ocean. It discusses the factors that influence the rate of precipitation of barium as barite. The toxicity of barium to marine and freshwater organisms and humans is discussed in relation to the concentrations and forms in which it occurs in aquatic environments.
Pages: 68
September 1995 | Product Number: I46330 | Price: $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 those rates along with suggestions for selecting an appropriate technique, depending on site conditions, are provided in this report.
Pages: 204
July 1996 | Product Number: I46430 | Price: $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
Impairment. Pages: 124

They do indicate that a release does not necessarily cause groundwater. In 70% of these scenarios, chloride concentrations in groundwater do not exceed 1000 mg/L. Although these numbers give no edge of the release. In 70% of these scenarios, chloride concentrations in monitoring wells that are adjacent to the 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 area of concern. The results of over 1000 modeled release scenarios reveal that 49% of single-event releases do not cause impairment of groundwater above drinking water quality impairment in homogeneous subsurface geologic profiles and (2) the trapping of pure EDB by soil samples was well studied because of its use as a soil fumigant. Similar studies were not conducted for 1,2-DCA; however, these two compounds have different transformation processes, and then monitoring data. While EDB and 1,2-DCA are expected to be similar. For example, the physical trapping of pure EDB by soil samples was well studied because of its use as a soil fumigant. Similar studies were not conducted for 1,2-DCA; however, based on the mechanism reported for EDB and the structural similarity of the two compounds, it is likely to be important for 1,2-DCA as well. In such cases, the reader is referred back to the relevant section of the report where the original data is reported. Pages: 142

December 1998 | Product Number: I46740 | Price: $79.00

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 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 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 is reported. Pages: 142


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 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 blended (BTEX) as well as the oxygenates methyl tertiary-butyl ether and isopropyl...
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-LNAPL, links the multiphase and chemical processes controlling in-situ LNAPL distribution, mobility, and cleanup to quantitatively estimate the time-dependent concentrations within the LNAPL source and the down gradient dissolved plume. API-LNAPL 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/lnap1

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 transacts 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

Publ 4760
LNAPL Distribution and Recovery Model (LDRM)

Simulates the performance of proven hydraulic technologies for recovering free-product petroleum liquid releases to groundwater. The LDRM provides information about 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.


Publ 4762
API LNAPL Transmissivity Workbook: A Tool for Baildown Test Analysis-User Guide

LNAPL transmissivity is a measure of lateral mobility of free-product hydrocarbon liquid within the groundwater environment. The magnitude of LNAPL transmissivity has been suggested as a possible endpoint criterion for LNAPL mass removal using LNAPL hydraulic recovery systems. Such hydraulic recovery systems include skimmer wells, single-pump wells, dual-pump wells, and trenches. Coupled with the LNAPL CSM, the magnitude of LNAPL transmissivity will assist in the selection of recovery system. As such, methods and their consistent application for estimating LNAPL transmissivity are significant. Perhaps the simplest methods for estimating LNAPL transmissivity are borehole slug test methods, or baildown tests, in which a volume of LNAPL is rapidly removed from a well and the rate of fluid-level recovery (water and LNAPL) is measured and analyzed. Several analytical methods are available to analyze the data from baildown tests to estimate LNAPL transmissivity and described herein. Following a brief description of suggested well configuration, pre-test and test measurements and methods, application of the spreadsheet tool is discussed. Subsequent sections provide a more detailed discussion of significant parameters and basis for
the various analysis procedures. A number of example applications are presented. Further details on the different methods are provided in the appendices. Pages: 40

April 2016 | Product Number: I47620 | For a free copy of this document, please visit http://www.api.org/~media/4762%20NAPL%20TN%20wkbk%20Baldwin%20Userguide%20Apr2016%20(2).pdf

SITE CHARACTERIZATION

Publ 4599
Interlaboratory Study of Three Methods for Analyzing Petroleum Hydrocarbons in Soils

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

July 1994 | Product Number: I47990 | Price: $97.00

Publ 4635
Compilation of Field Analytical Methods for Assessing Petroleum Product Releases

Presents a compilation of the most widely used field analytical methods available to perform on-site analyses of organic compounds in soil and groundwater. These methods include total organic vapor analyzers, field gas chromatography, immunoassay, infrared analyzers, and dissolved oxygen/oxidation-reduction potential electrodes. Practical applications and limitations of each method are discussed and an objective-oriented data quality classification scheme is presented to assist in selecting an appropriate method. Information is also presented on emerging technologies. Pages: 100

December 1996 | Product Number: I46350 | Price: $87.00

Publ 4657
Effects of Sampling and Analytical Procedures on the Measurement of Geochemical Indicators of Intrinsic Bioremediation: Laboratory and Field Studies

Evaluates the effects of various sampling and analytical methods of collecting groundwater geochemical data for intrinsic bioremediation studies. Sampling and analytical methods were tested in the laboratory and in the field. Several groundwater sampling and analytical methods may be appropriate for measuring geochemical indicators of intrinsic bioremediation. The methods vary in accuracy, level of effort, and cost. Pages: 86

November 1997 | Product Number: I46570 | Price: $61.00

Publ 4658
Methods for Measuring Indicators of Intrinsic Bioremediation: Guidance Manual

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

November 1997 | Product Number: I46580 | Price: $70.00

Publ 4659

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

February 1998 | Product Number: I46590 | Price: $117.00

Publ 4668
Delineation and Characterization of the Borden MTBE Plume: An Evaluation of Eight Years of Natural Attenuation Processes

In 1988, a natural gradient tracer test was performed in the shallow sand aquifer at Canada Forces Base 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 xylene (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

June 1998 | Product Number: I46680 | Price: $61.00

Publ 4670
Selecting Field Analytical Methods—A Decision-Tree Approach

Presents a decision-tree approach for selecting and using field analytical methods for on-site analyses of organic compounds in soil, groundwater, and soil gas samples at petroleum release sites. This approach will assist project or site managers with guidance for on-site investigations from initial site assessment to site closure. The decision-tree charts are supported by quality control packages to increase the credibility of the data by documenting method performance. The publication also provides training suggestions for personnel who will perform the testing. Easy to use checklists for field quality control and formal documentation are included. Pages: 88

August 1998 | Product Number: I46700 | Price: $87.00

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
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 used to determine the 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 condensates 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) waste. A listing of key equations used for calculating RBSLs is provided. 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.

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. Risk-based screening levels (RBSLs) are a collection of information about samples that have had their capillary properties determined, as well as other physical parameters measured. 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. 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 and 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.

This publication is related to an API licensing, certification, or accreditation program. This is an/API-related publication.
The model, which applies a quality systems approach to managing EHS activities, focuses on people and procedures by pulling together company EHS policies, legal requirements, and business strategies into a set of company or facility expectations or requirements.

Please refer to the companion document 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: R9100 | Price: $157.00

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

*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 supersed 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.
Health and Environmental Issues

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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 of the performance of different types of leak detection technologies that were applied to buried pressurized piping systems used in airport hydrant fueling and petroleum product terminals. The study was conducted by Argus Consulting and Ken Wilcox Associates on behalf of the Air Transport Association of America 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 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

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Publ 4672  
**The Use of Treatment Wetlands for Petroleum Industry Effluents**

Treatment wetlands are becoming widely used for cleansing some classes of wastewater effluents. Although the use of treatment wetlands is well established for wastewater categories such as municipal waste, stormwater, agricultural wastewater, and acid mine drainage water, their use in treating a variety of industrial wastewaters is less well developed. Constructed treatment wetlands hold considerable promise for managing some wastewaters generated by the petroleum industry. Several large-scale wetland projects currently exist at oil refineries, and numerous pilot studies of constructed treatment wetlands have been conducted at terminals, gas and oil extraction and pumping stations, and refineries. This report summarizes current information about the use of treatment wetlands for managing petroleum industry wastewaters and also presents background information on the general performance, design, and operation of treatment wetlands based on experience with a variety of wastewater types. Pages: 222

October 1998 | Product Number: I46720 | Price: $97.00

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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

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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

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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

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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 ensuring 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

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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

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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

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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
current federal and state regulatory responses to nutrient-related water quality problems, the scientific and implementation challenges of nutrient controls, and the petroleum refining industry’s relative contribution to nationwide nutrient discharges to surface waters. This study is based on using available published data on nutrient enrichment of U.S. surface waters; the U.S. Environmental Protection Agency (EPA) and state nutrient control guidance, policy, and water quality standards; prior analysis performed for API by a third-party consultant; petroleum refinery effluent quality data from the EPA Integrated Compliance Information System/National Pollutant Discharge Elimination System (ICIS-NPDES); and permit data collected from the files of the Texas Commission on Environmental Quality (TCEQ). Pages: 35

August 2016 | Product Number: I47820 | Price: $75.00

**Publ 4783**

Water Management and Stewardship in Midstream, Downstream, and Delivery Operations in the Oil and Gas Industry

This report uses the oil and gas (petroleum) life cycle as an organizing framework for explanation and discussion. The scope of this study is focused on the midstream, downstream, and delivery components of the oil and gas life cycle. Upstream components of the life cycle will be addressed in a future report. This study is intended to inform stakeholders about how the oil and gas industry uses water in the midstream, downstream, and delivery phases of the petroleum life cycle and the various industry-led and regulatory practices employed to conserve and protect water resources. Pages: 46

December 2016 | Product Number: D47830 | Price: $75.00

**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 (Mysisopsis 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: $62.00

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

Publ 4656
Bioaccumulation: How Chemicals Move from the Water into Fish and Other Aquatic Organisms
Provides an intermediate-level primer on the accumulation of chemicals by aquatic organisms with emphasis on polycyclic aromatic hydrocarbons. Key factors governing bioaccumulation are described to enhance understanding of this complex phenomenon. Approaches for assessing the bioaccumulation potential of chemicals are examined and an evaluation of each method's advantages and shortcomings is offered. Pages: 54
May 1997 | Product Number: I46560 | Price: $87.00

Publ 4666
The Toxicity of Common Ions to Freshwater and Marine Organisms
Whole effluent toxicity (WET) tests have become a common tool in the evaluation of effluent for discharge acceptability. Recent investigations have indicated that deficiencies or excesses of “common” ions (inorganic ions that are nearly always present in most aquatic systems at nontoxic concentrations) can cause significant acute or chronic toxicity in WET tests. This report presents the results of a review of toxicological and physiological data on inorganic ions that have been implicated in causing significant toxicity—bicarbonate, borate, bromide, calcium, chloride, fluoride, magnesium, potassium, strontium, and sulfate. Pages: 114
April 1999 | Product Number: I46660 | Price: $97.00

Publ 4701
Bioaccumulation: An Evaluation of Federal and State Regulatory Initiatives
August 2000 | Product Number: I47010 | Price: $88.00

EFFluENTS: EXPLORATION AND PRODUCTION

DR 351
Proceedings: Workshop to Identify Promising Technologies for the Treatment of Produced Water Toxicity
Presents the discussions, conclusions and recommendations of an API workshop held in October 1994 to identify technologies that could potentially be used for the treatment of produced water toxicity offshore. Background information on the candidate technologies; information on produced water toxicity limitations, characteristics, and composition; results of toxicity identification evaluations; and a discussion of the engineering restrictions imposed by offshore platforms are included. Pages: 122
June 1996 | Product Number: I00351 | Price: $73.00

Publ 4611
Interlaboratory Study of EPA Methods 1662, 1654A and 1663 for the Determination of Diesel, Mineral and Crude Oils in Drilling Muds from Offshore and Gas Industry Discharges
Describes an interlaboratory round-robin study to validate the tiered approach of the U.S. Environmental Protection Agency's three methods—1662, 1654A, and 1663—for monitoring diesel oil in drilling muds. Various extraction methods were evaluated and analytical measurement techniques were tested for measuring diesel oil. Pages: 106
April 1995 | Product Number: I46110 | Price: $73.00

Publ 4633
Barium in Produced Water: Fate and Effects in the Marine Environment
Provides a summary of what is currently known about the physical and chemical behavior of barium in produced water and in the ocean. It discusses the factors that influence the rate of precipitation of barium as barite. The toxicity of barium to marine and freshwater organisms and humans is discussed in relation to the concentrations and forms in which it occurs in aquatic environments. Pages: 68
September 1995 | Product Number: I46330 | Price: $59.00

Publ 4641
Summary of Produced Water Toxicity Identification Evaluation Research
Summarizes the results of a three-part study to evaluate the ability of U.S. Environmental Protection Agency proposed toxicity identification evaluations (TIEs) to determine the potential toxicants in produced water from oil and gas production operations in various locations. Factors affecting the results of the TIEs were identified as well as potential toxicants. Suggestions for improving TIE procedures are included. Pages: 102
June 1996 | Product Number: I46410 | Price: $88.00

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

EFfluENTS: MARKETING

Publ 4602
Minimization, Handling, Treatment and Disposal of Petroleum Products Terminal Wastewaters
Intended to be a basic guide and information resource for all wastewater operations at petroleum product terminals. It includes the regulatory framework for wastewater issues, a detailed description of the sources of terminal wastewater and associated contaminants as well as guidance on means for analyzing the wastewater situation at a terminal, for minimizing wastewater flow contamination, and for wastewater handling and disposal. Pages: 120
September 1994 | Product Number: I46020 | Price: $130.00

Publ 4665
Analysis and Reduction of Toxicity in Biologically Treated Petroleum Product Terminal Tank Bottoms Water
Objectives of this study were to measure toxicity in biologically treated petroleum product terminal tank bottoms waters, identify the chemical constituents causing that toxicity, identify treatment options, and measure the effectiveness of the treatment techniques in removing the constituents and reducing toxicity. Nine gasoline and two diesel tank bottoms water samples were collected from petroleum product terminals at various
geographical locations. The samples were normalized to a fixed chemical oxygen demand, then subjected to biological treatment. Treated samples were tested for acute toxicity in 24-hour exposure tests using Mysidopsis bahia and for chronic toxicity in 7-day static renewal toxicity tests also using Mysidopsis bahia. Biological treatment was observed to effectively remove metals but produced highly variable degrees of chemical oxygen demand, biochemical oxygen demand, and total organic carbon. Pages: 52

April 1998 | Product Number: I46900 | Price: $132.00

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

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 "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

EFFLUENTS: REFINING

DR 148
Identification of Organic Toxicals 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 toxicals 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 toxicals were a phenol associated with a jet fuel additive, and two brominated organics believed to be reaction products of cooling tower water treatment chemicals, rather than from crude oil constituents. Pages: 64

December 1997 | Product Number: IO0148 | Price: $61.00

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

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 workover; or offshore oil drilling, production, or workover) in accordance with the regulation and guidance, instruction, and clarification for completing each section of the template. The purpose of this rulemaking was to establish procedures, methods, and equipment to prevent and contain discharges of oil from non-transportation-related onshore and offshore facilities, thus preventing pollution of navigable waters of the United States. The development of this bulletin was commissioned by API and performed by Response Management Associates, Inc. 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

TR 425 ■
Options for Minimizing Environmental Impacts of Inland Spill Response

The purpose of this guide is to support contingency planners and emergency responders in evaluating response techniques and selecting those techniques that will most effectively prevent or minimize adverse environmental impacts from inland spills. In this guide, inland spills are defined as those that affect terrestrial and freshwater habitats, whereas coastal and marine spills affect water bodies and habitats that are under the
influence of tides and marine waters. Inland spills have unique characteristics and behavior, therefore having the potential to pose greater risks to the public, and often necessitate more intensive removal methods, compared to coastal and marine spills. Therefore, choosing the best response options and implementing these in the most environmentally appropriate manner can minimize adverse impacts of a response. Pages: 102

October 2016 | Product Number: I42500 | For a free copy of this document, please visit http://oilspillprevention.org/~media/Oil-Spill-Prevention/spillprevention/r-and-d/inland/options-for-minimizing-environmental-imp.pdf

TR 1149-3 ■
Canine Oil Detection: Field Trials Report
Field trials were undertaken in June 2015 to evaluate the applicability of canine oil detection teams (referred to as K9-SCAT) to support assessment surveys to locate and delineate the horizontal extent of subsurface oil for shoreline and inland spills response operations. The study is part of the American Petroleum Institute (API) Joint Industry Task Force (JITF) Shoreline Protection & Clean-Up Technical Working Group within the Oil Spill Preparedness and Response program. Pages: 59

June 2016 | Product Number: I114930 | For a free copy of this document, please visit www.oilspillprevention.org/~media/Oil-Spill-Prevention/spillprevention/r-and-d/shoreline-protection/canine-oil-detection-field-trials-report.pdf

TR 1149-4 ■
Canine Oil Detection (K9-SCAT) Guidelines
The purpose of these Guidelines is to provide information on the potential for detection canines to support a shoreline or inland oiled area assessment (SCAT) program. This information includes how oil detection dogs use their sense of smell and what they can do to locate and delineate surface and subsurface oil, the current state of knowledge regarding situations and types of support surveys that a K9-SCAT team can undertake as part of a SCAT program, and how to plan and design a K9-SCAT survey and collect the appropriate data to document that mission. Pages: 81

July 2016 | Product Number: I114940 | For a free copy of this document, please visit www.oils spillprevention.org/~media/Oil-Spill-Prevention/spillprevention/r-and-d/shoreline-protection/canine-oil-detection-k9-scat-guidelines.pdf

TR 1151-4 ■
Mechanical Treatment of Sand Beaches Historical Library Report
This report describes the Mechanical Treatment Library, which represents part of a multiphase study conducted by the American Petroleum Institute to improve the mechanism treated spill oil on sand beaches. Pages: 5

June 2016 | Product Number: I115140 | For a free copy of this document, please visit www.oils spillprevention.org/~media/Oil-Spill-Prevention/spillprevention/r-and-d/shoreline-protection/mechanical-treatment-of-sand-beaches-his.pdf

TR 1153-1 ■
Tidal Inlet Protection Strategies (TIPS): Phase 1—Final Report
This report presents an approach for the development of Tidal Inlet Protective Strategies (TIPS) that are based on knowledge of the physical systems involved and feasibility of tactical options. Strategies and tactics identified using the results of this study are subject to real-time conditions and pre-spill planned strategies should be re-evaluated during a response. The report considers potential tactics at a level appropriate for strategic planning, but is not intended to provide instructions for the implementation of those tactics. The guide is intended to be used by strategic planners and responders, and may be appropriate for inclusion in an Area Contingency Plan (ACP) or a Geographic Response Plan (GRP). Pages: 53

January 2014 | Product Number: I115310 | For a free copy of this document, please visit www.oils spillprevention.org/~media/Oil-Spill-

TR 1153-2 ■
Tidal Inlet Protection Strategies (TIPS) Field Guide
This field guide is intended to be used by strategic planners and responders with the purposes of explaining the physical dynamics and characterization of a tidal inlet, identifying oil transport and operational constraints and opportunities for tidal inlet protection, identifying potential strategies for protection, and providing considerations and checklists for tidal inlet protection. Pages: 27

January 2016 | Product Number: I115320 | For a free copy of this document, please visit www.oils spillprevention.org/~media/Oil-Spill-Prevention/spillprevention/r-and-d/shoreline-protection/tips-field-guide-final.pdf

TR 1154-1 ■
Sunken Oil Detection and Recovery
The purpose of this report is to identify and document current best practices and proven technologies possessing the potential to more effectively (1) detect, delineate, and characterize, (2) contain, and (3) recover sunken oil, defined as the accumulation of bulk oil on the bottom of a water body; and recommend research and development for the highest potential new technologies. Pages: 116

February 2016 | Product Number: I115410 | For a free copy of this document, please visit www.oils spillprevention.org/~media/Oil-Spill-Prevention/spillprevention/r-and-d/inland/sunken-oil-technical-report-pp2.pdf

TR 1154-2 ■
Sunken Oil Detection and Recovery Operational Guide
This operational guide is a companion document to the technical report, Sunken Oil Detection and Recovery, which identifies and documents current best practices and alternative technologies possessing the potential to more effectively detect, contain, and recover sunken oil, defined as the accumulation of bulk oil on the bottom of a water body. The technical report includes summaries and lessons learned for 36 case studies of oil spills where a significant amount of the oil sank. For each technology, it includes a detailed description of the method, advantages and disadvantages, and summary tables—the kinds of information needed to select the most effective approaches to sunken oil detection and recovery. Please refer to the technical report for supporting information not in this guide. Pages: 28

February 2016 | Product Number: I115420 | For a free copy of this document, please visit www.oils spillprevention.org/~media/Oil-Spill-Prevention/spillprevention/r-and-d/inland/sunken-oil-ops-guide.pdf

TR 1155-1 ■
Shoreline In Situ Treatment (Sediment Mixing and Relocation) Library Report
The American Petroleum Institute (API) completed a study to improve the knowledge and understanding of shoreline sediment mixing and relocation techniques. The objective of the study is to provide the following tools: (1) Shoreline In Situ Treatment Library: an online library containing academic, scientific, technical, and operational literature, including links to electronic documents, where available; (2) Shoreline In Situ Treatment Fact Sheet: a non-academic educational guide, providing an overview of in situ treatment and Oil Particle Aggregate (OPA) formation for training and planning (TR 1154-2); and (3) Shoreline In Situ Treatment Job Aid: a non-academic operations tool for use during a response by Operations, the Environmental Unit (EU), and Shoreline Cleanup Assessment Technique (SCAT) teams for in situ treatment planning and operations, and to demonstrate to agencies how effectiveness and effects would be monitored (TR 1154-3). This report describes the first item of this program, the Shoreline In Situ Treatment Library, which is intended to locate and make available documents relevant
to shoreline in situ (sediment mixing and relocation) treatment techniques. The library is provided in simple MS Excel spreadsheet and MS Access database formats, which are described in this report. Pages: 5

June 2016 | Product Number: I115510 | For a free copy of this document, please visit www.oilspillprevention.org~/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/shoreline-protection/shoreline-in-situ-treatment-report.pdf

TR 1155-2 ♦ Shoreline In Situ Treatment (Sediment Mixing and Relocation) Fact Sheet

This fact sheet explains the use of shoreline in situ techniques, including wet and dry mixing (also known as tilling or aeration) and sediment relocation (also known as surf washing or berm relocation) for oil spill cleanup. Burning is outside the scope of this fact sheet. Pages: 20


TR 1155-3 ♦ Shoreline In Situ Treatment (Sediment Mixing and Relocation) Job Aid

The purpose of this job aid is to provide:
• a non-technical tool for planning and conducting shoreline in situ treatment for use by Shoreline Cleanup Assessment Technique (SCAT) teams as they develop shoreline treatment recommendations (STRs); Environmental Unit personnel and planners during the decision process; and Shoreline Operations to implement the treatment tactics.
• Decision guides and checklists to assist in understanding the advantages and consequences of shoreline in situ treatment options, and the decision, review, and approval process for shoreline in situ treatment.

This job aid provides guidance for the planning and implementation of in situ techniques on shorelines and rivers, including wet and dry mixing (also known as tilling or aeration) and sediment relocation (also known as surf washing or berm relocation) for oil spill cleanup. Burning on the shoreline is outside the scope of this job aid. Pages: 26


TR 1253 ♦ API Selection and Training Guidelines for In Situ Burning Personnel

This guidance is intended to be international in its scope with United States regulatory requirements used as exemplars that may be replaced by applicable jurisdictional requirements. References to the Hazardous Waste Operations and Emergency Response (HAZWOPER) regulation (29 CFR 1910.120) and the Incident Command System (ICS) may be replaced by local jurisdictional requirements outside of the United States. In the absence of applicable local requirements, HAZWOPER and ICS should be considered as a recognized standard of practice. This guidance is not intended to instruct the reader on how to conduct an in situ burn, or overlap with either of the in situ burn manuals (TR 1251 and TR 1252). The purpose of this guidance is to provide a systematic approach to assist users in the selection of responder qualifications and the training requirements for responders to in situ burning of spilled oil in the open water environment, ice conditions on water bodies, and the inland environment, including spills affecting waterways and those lakes not considered open water. It is not intended to describe when to use in situ burning. Pages: 84


TR 1256 ♦ In Situ Burning: A Decision Maker's Guide

This report is intended to describe the use of and requirements for in situ burning (ISB) as an effective response technology for oil spills on land (including wetlands), on water, or in ice and snow. It was developed to serve as a reference for oil spill response policy makers and decision makers (government, industry, and other stakeholders). This report discusses requirements for ISB and includes a summary of oil chemistry, behavior, and weathering, which are important factors when making decisions to use ISB. Further, it allows decision makers to better understand the anticipated benefits and limitations to be considered when using this technology for an oil spill. Pages: 74


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 strategies for minimizing environmental impacts for oil spills in freshwater environments and habitats. Spill topics of concern in freshwater settings are discussed, including public health, conditions under which oil might sink in freshwater, oil behavior in ice conditions, permafrost, and firefighting foam use. Pages: 146

February 1995 | Product Number: I45580 | Price: $87.00

Publ 4640 Petroleum in the Freshwater Environment: An Annotated Bibliography, 1946-1993

The growing concern for petroleum contamination in freshwater ecosystems led API to generate an annotated bibliography to serve as a valuable resource of existing literature on petroleum and its impact on the freshwater environment. It cites literature from 1946 through 1993 on the impact of petroleum products and oil spill cleanup agents on the biota of freshwater ecosystems, and 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 (VIP editable) Product Number: I46401 | Price: $75.00

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
Health and Environmental Issues

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: I14689 | 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 concise easy-to-use information on understanding the fate of spilled oil and dispersants, their use, effectiveness, and effects. When making decisions regarding dispersant use, or any other oil spill response countermeasure, it is important to have a clear understanding of the overall fate of the oil entering the environment. With this publication you will receive a complete yet concise review of oil chemistry and oil weathering. Also provided is information on how to interpret dispersant information more effectively and how dispersants alter or affect the weathering processes of oil. Pages: 30

March 1999 | Product Number: I46910 | Price: Free*

Publ 4692
A Decision-Maker's Guide to Dispersants: A Review of the Theory and Operational Requirements

This is the second of three short summary publications commissioned for preparation by the 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 Oil and Chemically Dispersed Oil in the Environment

Crude oil is a complex, highly variable mixture of hydrocarbons and other trace compounds, and exposure may cause a variety of adverse effects. Dispersants are mixtures of chemicals, solvents, and surfactants used to reduce oil viscosity and help the oil break up and disperse into the water column. This booklet is intended to help bridge the gap in understanding information about exposure and effects of untreated oil and chemically dispersed oil in the marine environment. 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.” The National Oceanographic and Atmospheric Administration, the U.S. Coast Guard and the U.S. Environmental Protection Agency developed the Marine Manual for oil spill contingency planners and field responders. The information allows both planners and responders to identify techniques that minimize the ecological impact of both the response action and the spilled oil. Matrix tables allow comparison of 28 different methods for response, and classify their relative environmental impacts for combinations of 5 different oil types and 25 marine habitats. 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

Publ 4735
In-Situ Burning: The Fate of Burned Oil

The in-situ burn (ISB) is an oil spill response option that has been used far less frequently than mechanical countermeasures (booms, skimmers, etc.), and consequently, familiarity with ISB operations is limited. Decision-makers need a comprehensive understanding of the oil, how it acts in the environment, and aspects of the burn process in order to understand the behavior of any ISB by-products and the potential impacts from an in-situ burn. This document was designed to capture that knowledge and present it clearly and concisely so you will have the necessary information to understand issues associated with fate and effects of oil to which ISB has been applied. It is not a set of instructions for carrying out a specific ISB. 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 smithies technology when responding to an oil spill on land or on water. Pages: 76


OIL SPILLS: MSRC REPORTS


TR 91-001
Priority Topics for Research and Development in Oil Spill Response

TR 92-001
An Analysis of Historical Oil Spills and Current Cleanup Requirements to Aid in Selecting New Technologies for Spill Cleanup Operations

TR 92-002
Airborne Surveillance Technology Options for Improving Oil Spill Cleanup and Response

TR 92-003
Tenyo Maru Oil Spill (Remote Sensing Data Analysis)

TR 92-004
Oil Spill Detection Using Satellite-Based SAR

TR 92-006
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TR 93-001
Evaluation of Marine Post-Spill Sites for Long-Term Recovery Studies

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Interlaboratory Calibration Testing of Dispersant Effectiveness: Phase 1

TR 93-003.2
Interlaboratory Calibration Testing of Dispersant Effectiveness: Phase 2

TR 93-004
Oil Spill Detection: Documentation of Historical Remote Sensing Projects and Status

TR 93-006
MSRC Oil Spill Response Vessel Recovered Oil Systems Tests

TR 93-007
Occupational Health Implications of Crude Oil Exposure: Literature Review and Research Needs

TR 93-009.1
Aerial Dispersant Application: Assessment of Sampling Methods and Operational Altitudes, Vol. 1

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Health and Environmental Issues

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BIENNIAL OIL SPILL CONFERENCE PROCEEDINGS

These conferences are sponsored by API, the U.S. Environmental Protection Agency, the U.S. Coast Guard, the International Petroleum Industry Environmental Conservation Association, and the International Maritime Organization. They address oil-spill prevention, behavior, effects, control, and cleanup.

Publ 4452
1987 Oil Spill Conference Proceedings
Product Number: I44520 | Price: $57.00

Publ 4479
1989 Oil Spill Conference Proceedings
Product Number: I44790 | Price: $57.00

Publ 4529
1991 Oil Spill Conference Proceedings
Product Number: I45290 | Price: $57.00

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 4580
1993 Oil Spill Conference Proceedings
Product Number: I45800 | Price: $59.00

Publ 4620
1995 Oil Spill Conference Proceedings
Product Number: I46200 | Price: $59.00

Publ 46201
1995 Abstracts to Oil Spill Conference Proceedings
Product Number: I46201 | Price: $59.00

Publ 4621
1995 Oil Spill Conference White Papers
Three white papers—(1) “Implementing an Effective Response Management System,” (2) “The Use and Misuse of Science in Natural and Resource Damage Assessment,” and (3) “Perspectives on Establishing and Maintaining Oil Pollution Capabilities”—were prepared for the 1995 Oil 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
Product Number: I46210 | Price: $59.00

Publ 4651
1997 Oil Spill Conference Proceedings
April 1997 | Product Number: I46510 | Price: $59.00

Publ 4652
1997 Oil Spill Conference Issue Papers
Three issue papers—(1) “Putting Dispersants to Work: Overcoming Obstacles;” (2) “International Responsibilities: Are We Our Brothers’ Keeper?”; and (3) “Differences in Risk Perception: How Clean is Clean?”—were prepared for the 1997 Oil 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
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December 1999 | Product Number: I46750 | Price: $142.00

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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

Publ 4710
2003 Oil Spill Conference Proceedings
CD-ROM Product Number: I4710A | Price: $308.00
Hard Copy Product Number: I4710B | Price: $308.00

Publ 4718
2005 Oil Spill Conference Proceedings
CD-ROM Product Number: I47180A | Price: $308.00
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 landspreading, roadspreading, 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 (sand 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: 80

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

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

Guidelines for Commercial Exploration and Production Waste Management Facilities
Provides guidelines for the design and operations of commercial E&P waste management facilities to allow operators to identify areas where their facility could have impacts on the surrounding community and environment, and gives options for preventing/reducing those impacts. The guidelines are not meant to supersede any applicable local, state, or federal requirements. 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

This report presents the analytical characterization of 120 associated waste. This report presents the analytical characterization of 120 exploration and production associated waste.
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 4734
Modeling Study of Produced Water Release Scenarios

Provides a scientific basis for operators, regulators and landowners to determine if assessment or remediation of produced water releases will provide a meaningful environmental benefit. Pages: 124

January 2005 | Product Number: I47340 | Price: $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
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### Weekly Statistical Bulletin (WSB)

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API’s weekly data bulletin reports total U.S. and regional data relating to refinery operations and the production of the four major petroleum products: motor gasoline; kerosene jet fuel; distillate (by sulfur content); and residual fuel oil. These products represent more than 85% of total petroleum industry. Inventories and imports data of these products as well as of crude oil and unfinished oils are also included in the weekly report. Refinery inputs and utilization data are also included in the weekly report.

Published weekly every Tuesday afternoon (or every Wednesday afternoon in the event of a Monday U.S. Federal holiday).

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.

To obtain information on subscribing to the Weekly Statistical Bulletin, please visit www.api.org/data.

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### Monthly Statistical Report

Contains timely interpretation and analysis of recent developments on major products’ production, imports, refinery operations, and inventories. This report includes 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 mid-January, presents year-end supply/demand estimates and summarizes developments of the year. Quarterly estimates are also included 4 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 company level data on the imports of crude oil and petroleum products. Details include: record on importer, 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 imports report is based on reports published by the U.S. Department of Energy’s Energy Information Administration; however, it is presented in a more user friendly and easier reporting layout. The report is available by the second week of each month, containing data from 2 months earlier (e.g. August imports report is published around the second week of October). 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 at the end of each month, containing data from the prior month (e.g. August report is published at the end of September).

**Single Subscriber**  
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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.

The report is available within 2 weeks following the end of a quarter.

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### Sales of Natural Gas Liquids and Liquefied Refinery Gases

This report presents the results of the annual survey, published in December, jointly sponsored by the American Petroleum Institute (API), Gas Processors Association (GPA), National Propane Gas Association (NPGA), and Propane Education & Research Council (PERC). This publication reports estimated sales of propane gas broken down by end use on a state and PADD basis. The Summary section presents the sales of butane, ethane, pentanes plus, and propane broken down by product type and PADD.

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### Joint Association Survey on Drilling Costs (JAS)

The JAS is an annual survey, published in December, 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) by depth interval. Additionally, the data in these tables are disaggregated by well class (exploratory wells and development wells) and offshore and onshore production.

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### Basic Petroleum Data Book (2 Issues)

It provides valuable domestic and world statistical background information, beginning in most instances with 1947. Included are data on energy, reserves, exploration and drilling, production, finance, prices, demand, refining, imports, exports, offshore transportation, natural gas, Organization of Petroleum Exporting Countries, and environment.

The printed Data Book is updated and published twice a year, in June and December. Each report is issued in a self-contained, bound volume and is no longer needed once the next issue is published.

Both the electronic and printed versions also include a glossary of definitions and a source list (names, telephone numbers) for references in the Data Book.

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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

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A 17-minute educational and entertaining DVD film for teen students that uses pop music and dance to illustrate the often invisible role petroleum products play in our lives. It shows how oil is transformed into products such as gasoline, jet fuel, cosmetics, clothing, CDs, and even aspirin. The film, designed for a middle-school audience, was produced by Emmy award-winning journalist Ellen Kingsley with a cast that includes a real science teacher and several teens.
September 1996 | Price: No charge for first five single copies
To order, contact the API Communications Department: (202) 682-8062
CHINESE *

Spec Q1
Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry—Chinese
Chinese translation of Spec Q1.
9th Edition | June 2013 | Product Number: G0Q109C | Price: $84.00

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.
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Specification for the Fabrication of Structural Steel Pipe—Chinese
Chinese translation of Spec 2B.
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Chinese translation of Spec 2C.
7th Edition | March 2012 | Product Number: G02C07C | Price: $101.00

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

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—Chinese
Chinese translation of RP 4G.
4th Edition | April 2012 | Product Number: G04G04C | Price: $82.00

RP 5A5/ISO 15463:2003
Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe—Chinese
Chinese translation of RP 5A5.
7th Edition | June 2005 | Product Number: GX5A507C | Price: $110.00

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

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Specification for Casing and Tubing—Chinese
Chinese translation of Spec 5CT.
9th Edition | July 2011 | Product Number: G5CT09C | Price: $166.00

RP 5C1
Recommended Practice for Care and Use of Casing and Tubing—Chinese
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RP 5C6
Welding Connections to Pipe—Chinese
2nd Edition | March 2006 | Product Number: G05C62C | Price: $61.00

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Specification for Drill Pipe—Chinese
Chinese translation of Spec 5DP.
1st Edition | August 2009 | Product Number: GX5DP01C | Price: $127.00

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Specification for Line Pipe—Chinese
Chinese translation of Spec 5L.
45th Edition | December 2012
Product Number: G05L45C | Price: $181.00

Spec 5LCP
Specification on Coiled Line Pipe—Chinese
Chinese translation of Spec 5LCP.
2nd Edition | October 2006 | Product Number: G5LCP2C | Price: $103.00

RP 5LT
Recommended Practice for Truck Transportation of Line Pipe—Chinese
Chinese translation of RP 5LT.
1st Edition | March 2012 | Product Number: G5LT01C | Price: $42.00

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Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service—Chinese
Chinese translation of RP 5L2.
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| 3rd Edition | June 2004 | Product Number: GX16A03C | Price: $116.00  
| 2nd Edition | July 2004 | Product Number: G16D02C | Price: $124.00  
| Spec 16R | Specification for Marine Drilling Riser Couplings—Chinese (replaces API RP 2R)  
| 1st Edition | January 1997 | Product Number: G16R01C | Price: $68.00  
| Spec 17D/ISO 13628-4 | Design and Operation of Subsea Production Systems—Subsea Wellhead and Tree Equipment—Chinese  
| 2nd Edition | May 2011 | Product Number: GX17D02C | Price: $131.00  
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| Spec 19G1/ISO 17078-1:2004 | Side-Pocket Mandrels—Chinese  
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**RP 7G**
Recommended Practice for Drill Stem Design and Operating Limits—Kazakh
Kazakh translation of RP 7G.
16th Edition | August 1998 | Product Number: G07G64K | Price: $156.00

**TR 10TR1**
Cement Sheath Evaluation—Kazakh
Kazakh translation of TR 10TR1.
2nd Edition | September 2008 | Product Number: G10TR12K | Price: $116.00

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Selection of Centralizers for Primary Cementing Operations—Kazakh
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**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

**Spec 16D**
Specification for Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment—Kazakh
Kazakh translation of Spec 16D.
2nd Edition | July 2004 | Product Number: G16D02K | Price: $142.00

**RP 19B**
Recommended Practice for Evaluation of Well Perforators—Kazakh
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Kazakh translation of RP 19B.

**RP 49**
Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide—Kazakh
Kazakh translation of RP 49.
3rd Edition | May 2001 | Product Number: G4903K | Price: $71.00

**Std 53**
Blowout Prevention Equipment Systems for Drilling Wells—Kazakh
Kazakh translation of Std 53.

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**Spec 5L**  
Specification for Line Pipe—Russian  
Russian translation of Spec 5L.  
45th Edition | December 2012  
Product Number: G05L45R | Price: $207.00

**RP 5L2**  
Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service—Russian  
Russian translation of RP 5L2.  

**RP 5L7**  
Recommended Practice for Unprimed Internal Fusion Bonded Epoxy Coating of Line Pipe—Russian  
Russian translation of RP 5L7.  
2nd Edition | June 1988 | Product Number: G02906R | Price: $72.00

**RP 5L8**  
Recommended Practice for Field Inspection of New Line Pipe—Russian  
Russian translation of RP 5L8.  
2nd Edition | December 1996 | Product Number: G05L82R | Price: $100.00

**Spec 6AV1**  
Specification for Validation of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service—Russian  
Russian translation of Spec 6AV1.  
2nd Edition | February 2013 | Product Number: G6AV102R | Price: $64.00

**Spec 6D**  
Specification for Pipeline and Piping Valves—Russian  
Russian translation of Spec 6D.  
24th Edition | August 2014 | Product Number: G6D024R | Price: $120.00

**RP 6DR**  
Recommended Practice for the Repair and Remanufacture of Pipeline Valves—Russian  
Russian translation of Spec RP 6DR.  
2nd Edition | May 2012 | Product Number: G06DR2R | Price: $63.00

**Spec 6FA**  
Specification for Fire Test for Valves—Russian  
Russian translation of Spec 6FA.  
3rd Edition | April 1999 | Product Number: G06FA3R | Price: $78.00

**Spec 6FD**  
Specification for Fire Test for Check Valves—Russian  
Russian translation of Spec 6FD.  
1st Edition | February 1995 | Product Number: G06FD1R | Price: $72.00

**RP 7G**  
Recommended Practice for Drill Stem Design and Operating Limits—Russian  
Russian translation of RP 7G.  

**TR 10TR1**  
Cement Sheath Evaluation—Russian  
Russian translation of TR 10TR1.  

**TR 10TR2**  
Shrinkage and Expansion in Oilwell Cements—Russian  
Russian translation of TR 10TR2.  
1st Edition | July 1997 | Product Number: G10TR2R | Price: $97.00

**TR 10TR3**  
Technical Report on Temperatures for API Cement Operating Thickening Time Tests—Russian  
Russian translation of TR 10TR3.  
1st Edition | May 1999 | Product Number: G10TR3R | Price: $125.00

**TR 10TR4**  
Selection of Centralizers for Primary Cementing Operations—Russian  
Russian translation of TR 10TR4.  
1st Edition | May 2008 | Product Number: G10TR40R | Price: $48.00

**TR 10TR5**  
Methods for Testing of Solid and Rigid Centralizers—Russian  
Russian translation of TR 10TR5.  
1st Edition | May 2008 | Product Number: G10TR50R | Price: $48.00

**RP 11S2**  
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Russian translation of RP 11S2.  

**RP 11S3**  
Recommended Practice for Electrical Submersible Pump Installations—Russian  
Russian translation of RP 11S3.  

**Spec 12J**  
Specification for Oil and Gas Separators—Russian  
Russian translation of Spec 12J.  
8th Edition | October 2008 | Product Number: G12J08R | Price: $78.00

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

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| Chapter 5.4 | Accessory Equipment for Liquid Meters—Spanish  
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| Spanish translation of Ch. 8.3.  
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| Spanish translation of Ch. 10.9.  
| 3rd Edition | May 2013  
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| Spanish translation of Ch. 12.1.1.  
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| Spanish translation of Ch. 13.1.  
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| Spanish translation of Ch. 17.9, including Addendum 1 dated January 2014  
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| Spanish translation of API 510.  
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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 58 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.
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Chapter 11.1
Volume Correction Factors—Volume III
Table 6C—Volume Correction Factors for Individual and Special Applications, Volume Correction to 60°F Against Thermal Expansion Coefficients at 60°F.
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Chapter 11.1
Volume Correction Factors—Addendum to Volume III/IX Volume Correction—MTBE
Provides users of the API Manual of Petroleum Measurement Standards Chapter 11.1, Volume III (Table 6C) and Volume IX (Table 54C) with revised volume correction factor tables for MTBE. The tables can be used to expedite calculation of the volume of mixtures composed predominantly of MTBE at standard conditions from volumes at other conditions. These tables apply to commercially available mixtures containing at least 85 weight percent MTBE. The information gained from using these tables can be used to determine quantities of MTBE in tanks, shipping containers, and other storage containers typically used in the petroleum industry. Table 6C—Volume Correction Factors for Individual and Special Applications, Volume Correction for MTBE to 60°F and Volume IX, Table 54C—Volume Correction for Individual and Special Applications, Volume Correction for MTBE to 15°C.
Pages: 4
1st Edition | January 1995 | Price: $45.00

Chapter 11.1
Volume Correction Factors—Volume IV
Table 23A—Generalized Crude Oils, Correction of Observed Relative Density to Relative Density at 60/60°F.
Table 24A—Generalized Crude Oils, Correction of Volume to 60°F Against Relative Density 60/60°F.
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Chapter 11.1
Volume Correction Factors—Volume V
Table 23B—Generalized Products, Correction of Observed Relative Density to Relative Density at 60/60°F.
Table 24B—Generalized Products, Correction of Volume to 60°F Against Relative Density 60/60°F.
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Chapter 11.1
Volume Correction Factors—Volume VI
Table 24C—Volume Correction Factors for Individual and Special Applications, Volume Correction to 60°F Against Thermal Expansion Coefficients at 60°F.
August 1980 | Reaffirmed, March 1997 | Price: $45.00

Chapter 11.1
Volume Correction Factors—Volume VII
Table 53A—Generalized Crude Oils, Correction of Observed Density to Density at 15°C.
Table 54A—Generalized Crude Oils, Correction of Volume to 15°C Against Density at 15°C.
Table 55A—Generalized Lubricating Oils, Correction of Observed Density to Density at 15°C.
Table 56A—Generalized Lubricating Oils, Correction of Volume to 15°C Against Density at 15°C.
August 1980 | Reaffirmed, March 1997 | Price: $50.00

Chapter 11.1
Volume Correction Factors—Volume VIII
Table 54B—Generalized Products, Correction of Observed Relative Density to Relative Density at 15°C.
Table 55B—Generalized Products, Correction of Volume to 15°C Against Relative Density at 15°C.
August 1980 | Reaffirmed, March 1997 | Price: $50.00

Chapter 11.1
Volume Correction Factors—Volume IX
Table 54C—Volume Correction Factors for Individual and Special Applications, Volume Correction to 15°C Against Thermal Expansion Coefficients at 15°C.
August 1980 | Reaffirmed, March 1997 | Price: $45.00

Chapter 11.1
Volume Correction Factors—Volume X
Background, Development, and Computer Documentation, including computer subroutines in Fortran IV for all volumes of Chapter 11.1, except Volumes XI/XII, XIII, and XIV. Implementation procedures, including rounding and truncating procedures, are also included. These subroutines are not available through API in magnetic or electronic form. Pages: 403
August 1980 | Reaffirmed, March 1997 | Price: $45.00

Chapter 11.1
Volume Correction Factors—Volume XI/XII
Superceded by Chapter 11.5, Parts 1 to 3, 2009
(see page 59 of this Catalog)
Two combined volumes, containing Petroleum Measurement Subsidiary Tables 1-4, 8-14, 21, 22, 26-31, 33, 34, 51, 52, and 56-58, which provide conversions between volume measures and density measures.
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Chapter 11.1
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Table 53B—Generalized Lubricating Oils, Correction of Observed API Gravity to API Gravity at 15°C.
Table 54B—Generalized Lubricating Oils, Correction of Volume to 15°C Against API Gravity at 15°C.
Table 55B—Generalized Lubricating Oils, Correction of Volume to 15°C Against API Gravity at 15°C.
August 1982 | Reaffirmed, March 1997 | Price: $50.00
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.
January 1982 | Reaffirmed, March 1997 | Price: $50.00

Chapter 11.2.1
Compressibility Factors for Hydrocarbons: 0–90° API Gravity Range
Provides only the text information from Chapters 11.2.1, 11.2.1M, 11.2.3 and 11.2.3M.
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 only the text information from Chapters 11.2.1, 11.2.1M, 11.2.3, and 11.2.3M, along with a computer documentation containing text information from those chapters. The tables, presented in both standard and metric (SI) units, cover compressibility factors for hydrocarbons and water calibration of volumetric provers. The tape is 9-track, 1600 bpi, unlabeled, 4-file type, and is available in either ASCII or EBCDIC format. Format desired must be specified when ordering. Now available on disk. Please specify when ordering.
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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. Pages: 11
1st Edition | 1984

WITHDRAWN IN 2016

Std 2560
Reconciliation of Liquid Pipeline Quantities
1st Edition | December 2003

Chapter 17.7
Recommended Practices for Developing Barge Control Factors (Volume Ratio)
1st Edition | September 1995

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

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2INT-EX Interim Guidance for Assessment of Existing Offshore Structures for Hurricane Conditions, 1st ed. 2007
2INT-MET Interim Guidance on Hurricane Conditions in the Gulf of Mexico, 1st ed. 2007
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12E Wooden Tanks, 1st ed. 1943–6th ed. 1956
12G Welded Aluminum-Alloy Storage Tanks, 1st ed. 1957
12GDU Specification for Glycol-Type Gas Dehydration Units, 1st ed. 1990
12H Recommended Practice for Installation of New Bottoms In Old Storage Tanks, 1st ed. 1957
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15L4 Care and Use of Reinforced Thermosetting Resin Line Pipe, 2nd ed. 1976
15LT PVC Lined Steel Tubular Goods, 1st ed. 1993
16E Design of Control Systems for Drilling Well Control Equipment, 1st ed. 1990
16J Comparison of Marine Drilling Risers Analyses, 1st ed. 1992
17C Recommended Practice on TFL (Through Flowline) Systems, 2nd ed. 2002
17I Installation of Subsea Umbilicals, 1st ed. 1996
17M Recommended Practices on Remotely Operated Tool (ROT) Intervention Systems, 1st ed. 2004
25 Measuring Field Production and Storage Tanks, 1st ed. 1929–7th ed. 1948
26 Form of Agreement and Specifications for Pipe Line Crossings under Railroad Tracks, 1st ed. 1935
28 Code of Metallurgical Terms for Ferrous Alloys, 1st ed. 1937
30 Corrosion Fatigue Testing of Sucker Rod Materials, 1st ed. 1945
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38 Biological Analysis of Water-Flood Injection Waters, 1st ed. 1959–3rd ed. 1975
40 Core-Analysis Procedure, 1st ed. 1960, 2nd ed. 1998
41 Recommended Practice Standard Procedure for Preventing Performance Data on Hydraulic Fracturing Equipment, 1st ed. 1961
42 Laboratory Testing and Field Data Analysis of Surface-Active Agents for Well Stimulation, 1st ed. 1962, 2nd ed. 1977
44 Sampling Petroleum Reservoir Fluids, 1st ed. 1966, 2nd ed. 2003
46 Testing Foam Agents for Mist Drilling, 1st ed. 1966
47 Drilling Mud Report Form, 1st ed. 1969
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1623 Recommended Good Practices for Bulks Liquid-Loss Control in Terminals and Depots, 1st ed. 1963
1624 What to Do When the Power Goes Off, 1st ed. 1967
1625 Analysis of Temperature Effects on Gasoline Marketing Operations, 1st ed. 1979
1626 Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Service Stations, 1st ed. 1985
1627 Storage and Handling of Gasoline-Methanol/Cosolvent Blends at Distribution Terminals and Service Stations, 1st ed. 1986
1634 The Used Oil State Law Digest, 2nd ed. 1994
1659 Keeping it Clean: Making Safe and Spill-Free Motor Fuel Deliveries, 1st ed. 1992

Safety and Fire Protection

1A Cleaning Petroleum Storage Tanks—Section A, Crude Oil and Unfinished Products Tanks, 1955
1B Cleaning Petroleum Storage Tanks—Section B, Gasoline Tanks, 1955
3 Gas and Electric Cutting and Welding, 1953
4 Organization for Accident Prevention, 1942
5 Service Station Safety, 1959
8 Safe Practices in Bulk-Plant Operations, 1955
13A Cleaning Mobile Tanks Used for Transportation of Flammable Liquids—Section A, Tank Vehicles, 1955
13B Cleaning Mobile Tanks Used for Transportation of Flammable Liquids—Section B, Tank Cars, 1958
2002 API Inspection for Accident Prevention in Refineries, 1st ed. 1984
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2011 Safe Practices in Air or Gas Drilling, 1st ed. 1964

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2015B Cleaning Open-Top and Covered Floating-Roof Tanks, 1st ed. 1981
2016 Cleaning Tanks Used for Gasoline, 4th ed. 1961
2020 Driver Improvement Course, 1st ed. 1970
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2022 Fire Hazards of Oil Spills on Waterways, 1st ed. 1977, 2nd ed. 1982
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2031 Combustible-Gas Detector Systems and Environmental/Operational Factors Influencing their Performance, 1st ed. 1991
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2213 Ignition Risks of Ordinary Telephones, 1st ed. 1974
2215 Engine as a Burner Fuel, 1st ed. 1974, 2nd ed. 1982
2300 Evaluation of Fire Fighting Foams as Fire Protection for Alcohol Containing Fuels, 1st ed. 1985

Measurement

2501 Crude-Oil Tank Measurement and Calibration, 1st ed. 1955, 2nd ed. 1961
2502 API Recommended Practice for Lease Automatic Custody Transfer, 1st ed. 1961
2502 STD Lease Automatic Custody Transfer, 1st ed. 1967
2508 Design and Construction of Ethane and Ethylene Installations at Marine and Pipeline Terminals, Natural Gas Processing Plants, Refineries, Petrochemical Plants, and Tank Farms, 1st ed. 1979
2509A Bulletin on Lease Automatic Custody Transfer, 1956
2509B Shop Testing of Automatic Liquid-Level Gauges, 1961
2509C Volumetric Shrinkage Resulting from Blending Volatile Hydrocarbons with Crude Oils, 2nd ed. 1967, Reaffirmed 1992
2512 Tentative Methods of Measuring Evaporation Loss from Petroleum Tanks and Transportation Equipment, 1957
2513 Evaporation Loss in the Petroleum Industry—Causes and Control, 1959
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2518 Evaporation Loss from Fixed-Roof Tanks, 1962
2519 Bulletin on Use of Internal Floating Covers for Fixed-Roof Tanks to Reduce Evaporation Loss, 1962, 1976
2520 Bulletin on Use of Variable-Vapor-Space Systems to Reduce Evaporation Loss, 1964
2521 Use of Pressure-Vacuum Vent Valves for Atmospheric Pressure Tanks to Reduce Evaporation Loss, 1966
2523 Petrochemical Evaporation Loss from Storage Tank, 1st ed. 1969
2530 Orifice Metering of Natural Gas Fluids, 1st ed. 1955, 2nd ed. 1978
2531 Mechanical Displacement Meter Provers, 1st ed. 1960, 2nd ed. 1963
2533 Recommended Practice for Metering Viscous Hydrocarbons, 1st ed. 1969
2534 Measurement of Liquid Hydrocarbons by Turbine Meter Systems, 1st ed. 1970
2540 Petroleum Measurement Tables (Historical edition 1952), Superseded by MPMS Chapter 11.1
2541 Standard Tables for Positive Displacement Meter Prover Tanks, 1966
2542 Methods of Test for Water and Sediment in Crude Oils, 1968
2543 Method of Measuring the Temperature of Petroleum and Petroleum Products, 1965
2544 Method of Test for API Gravity of Crude Petroleum and Petroleum Products, 1967
2545 Method of Gauging Petroleum and Petroleum Products, 1st ed. 1965
2546 Method of Sampling Petroleum and Petroleum Products, 1965
2547 Density, Specific Gravity, or API Gravity of Crude Petroleum and Liquid Petroleum Products, 1967
2548 Method of Test for Water and Sediment in Crude Oils and Fuel Oils by Centrifuge, 1968
2550 Measurement and Calibration of Upright Cylindrical Tanks, 1966
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The Oil & Gas industry is highly regulated, with thousands of standards affecting all aspects of operations. To stay competitive, companies must:

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