2025

API PUBLICATIONS CATALOG

American Petroleum Institute

100 Years of Standards: A Legacy of Safety, Environmental Protection and Sustainability

API is proud to present its 2025 Publications Catalog, marking a century of developing industry-leading standards that drive safety, environmental protection, and operational excellence. The 2025 Edition includes API standards, recommended practices, specifications, and other technical documents that help the oil and natural gas industry operate safely and efficiently, delivering energy to billions of people around the world. Developed by leading industry subject-matter experts, API standards establish and maintain consensus guidelines, good practices, and equipment performance requirements for the industry.

Since 1924 when we published our first standard, API has advanced this mission, establishing practices that have guided the industry through technological innovations, operational challenges and evolving regulatory landscapes. From ensuring the integrity of critical infrastructure to reducing emissions and improving workplace safety, our standards provide a foundation for continuous improvement. Today, API's standards are referenced in more than 40 international markets—a testament to their best-in-class reputation and global impact.

The publications in this catalog are intended for all segments of the oil and natural gas industry.

- **Upstream standards** cover offshore structures and floating production systems, tubular goods, valves and wellhead equipment, and drilling and production equipment.
- **Midstream standards** cover pipeline and transportation-related subjects.
- **Downstream standards** address refinery equipment, including storage tanks, pressure-relieving systems, compressors, turbines, and pumps; safety and fire protection; and marketing.

As we look ahead to the next century, we remain committed to innovation. Through the development of standards for emerging technologies, including carbon capture, hydrogen infrastructure, and digitization, API is laying the foundation for a safer, more efficient, and sustainable industry for generations to come.

Anchal Liddar
API Senior Vice President, Global Industry Services

For more information or questions about the catalog, please contact the API Standards Department at 202-682-8417 or standards@api.org.

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Ordering Information

Print and PDF versions of API standards are available for purchase at **www.apiwebstore.org.**

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.

The standards are available for review only.

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NOTE Free publications with an asterisk are subject to a $10.00 handling charge for each total order, plus actual shipping charges.

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 ◆

Quality Management System Requirements for Organizations Providing Products for the Petroleum and Natural Gas Industry
(includes Errata 1 dated October 2023, Errata 2 dated October 2024, Errata 3 dated November 2024, and Addendum 1 dated October 2024)

Establishes minimum quality management system requirements for organizations that provide products for use in the petroleum and natural gas industry. Pages: 44

10th Edition | September 2023
Product Number: G0Q110 | Price: $160.00

Spec Q1 *

Quality Management System Requirements for Organizations Providing Products for the Petroleum and Natural Gas Industry—Chinese
(includes Errata 1 dated October 2023, Errata 2 dated October 2024, Errata 3 dated November 2024, and Addendum 1 dated October 2024)

Chinese translation of Spec Q1.

10th Edition | September 2023
Product Number: G0Q110CH | Price: $160.00

Spec Q1 *

Quality Management System Requirements for Organizations Providing Products for the Petroleum and Natural Gas Industry—Ukrainian
(includes Errata 1 dated October 2023, Errata 2 dated October 2024, Errata 3 dated November 2024, and Addendum 1 dated October 2024)

Ukrainian translation of Spec Q1.

10th Edition | September 2023
Product Number: G0Q109U | Price: $160.00

Spec Q2 ◆

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

Defines the quality management system (QMS) requirements for service supply organizations for the petroleum and natural gas industries. It is intended to apply to the execution of services for the petroleum and natural gas industry. This includes, but is not limited to, activities such as well construction, intervention, production, and abandonment, as well as repair/maintenance/configuration of service-related product. Pages: 33

2nd Edition | July 2021 | Product Number: G0Q202 | Price: $110.00

Spec Q2 *

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

Russian translation of Q2.

2nd Edition | July 2021 | Product Number: G0Q202R | Price: $110.00

RP 1FSC

Facilities Systems Completion Planning and Execution

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

1st Edition | July 2013 | Reaffirmed: December 2019
Product Number: G1FSC01 | Price: $76.00

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 or 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 subsea wellhead or at the surface for a well with a surface wellhead; or
- the flowing temperature is greater than 350 °F on the seafloor for a well with a subsea wellhead or on the surface for a well with a surface wellhead.

The design verification and validation protocols in this report 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: $182.00

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Std 1PTC ■
Product Design and Manufacturing Conformance Certification

Defines the necessary processes for product design conformance certification (PDCC) and product manufacturing conformance certification (PMCC). This document also defines processes for an independent type conformance organization (ITCO) to perform PDCC and/or subsequent PMCC for the manufactured product to confirm that the design and/or manufacturing requirements are met. As part of this process, this document defines the requirements for the competence, consistent operation, and objectivity of the independent party who performs these activities. Pages: 32

1st Edition | November 2024 | Product Number: G1PTC01 | Price: $104.00

Std 18LCM ◆
Product Life Cycle Management System Requirements for the Petroleum and Natural Gas Industries

Defines the requirements of a management system for service providers performing lifecycle management of products for organizations in the petroleum and natural gas industry. The document identifies requirements for service providers of lifecycle management and the activities required to perform product lifecycle management including determination of product lifecycle management status, actions required to maintain a status, and development of the lifecycle management plan.

Multiple products used together as part of a system application may be included in the scope of this document, but only as individual products. This document was developed for upstream activities application. This document is intended for pressure-containing and/or pressure-controlling products for wellbore fluids but may also be applied to other equipment that is specified by the product owner or customer. While this document and/or portions thereof could be applicable to other industry segments, it is recommended that other segments carefully review these requirements in order to determine their applicability and, if necessary, to develop an applicable annex identifying any segment-specific requirements.

This document does not include technical requirements for products and does not include requirements for determination of fitness-for-service for a particular product. In addition, this document does not include requirements for original design and manufacture of product. Pages: 14

1st Edition | April 2017 | Product Number: G18LCM1 | Price: $97.00

TR 18TR1 ◆
Guidance on Changes to API Q1, Ninth Edition

Written for experienced quality professionals seeking to implement the new requirements of API Q1, 9th Edition and to gain a deeper understanding of the requirements with an overall view to improving their quality management system (QMS) and conformance to API Q1, 9th Edition. While API Q1, 9th Edition was created independently of ISO 9001:2008, the specification continues to satisfy those requirements and the supplemental requirements in API Q1, 8th Edition. The formatting of API Q1, 9th Edition was revised to align with API Q2, 1st Edition and to follow a chronological order in the production and delivery of the product. Pages: 22

1st Edition | June 2015 | Product Number: G18TR101 | Price: $81.00

TR 18TR4
Evaluation of Welding Requirements as Applicable to API Product Specifications

A result of an evaluation of the consistency of welding requirements between API Product Specifications that are primarily used in exploration and production. The intent of the evaluation was to identify a means to standardize welding requirements across API Product Specifications. Pages: 117

1st Edition | December 2017
Product Number: G18TR401 | Price: $150.00

OFFSHORE STRUCTURES

TR 2A-LFS
Load Factor Study for API Recommended Practice 2A-LRFD

Evaluates the suitability of the load factors in API 2A-LRFD, 1st Edition (1993) given the accumulated experience since the 1980s about hurricane hazards and platform performance. Pages: 124

1st Edition | November 2020
Product Number: G2ALFS01 | Price: $138.00

RP 2A-LRFD
Planning, Designing, and Constructing Fixed Offshore Platforms—Load and Resistance Factor Design

Specifies requirements and provides recommendations applicable to the following types of fixed steel offshore structures for the petroleum and natural gas industries: free-standing and braced caissons, jackets, monotowers, and towers. In addition, it is applicable to compliant bottom founded structures, steel gravity structures, jack-ups, other bottom founded structures, and other structures related to offshore structures (such as underwater oil storage tanks, bridges, and connecting structures), to the extent to which its requirements are relevant. This document contains requirements for planning and engineering of the following tasks: design, fabrication, transportation, and installation of new structures, as well as their future removal; in-service inspection and integrity management of both new and existing structures; assessment of existing structures; and evaluation of structures for reuse at different locations. Pages: 518

2nd Edition | August 2019 | Reaffirmed: July 2024
Product Number: G2ALRFD2 | Price: $466.00

RP 2A-WSD
Planning, Designing, and Constructing Fixed Offshore Platforms—Working Stress Design

Contains requirements for the design and construction of new fixed offshore platforms and for the relocation of existing platforms used for drilling, development, and storage of hydrocarbons in offshore areas. In addition, this document should be used in conjunction with RP 2SIM for the assessment of existing platforms in the event that it becomes necessary to make a determination of the fitness-for-purpose of the structure. Pages: 310

22nd Edition | November 2014 | Reaffirmed: September 2020
Product Number: G2AWSD22 | Price: $491.00

RP 2A-WSD *
Planning, Designing, and Constructing Fixed Offshore Platforms—Working Stress Design—Russian

Russian translation of RP 2A-WSD.

22nd Edition | November 2014 | Reaffirmed: September 2020
Product Number: G2AWSD22R | Price: $491.00

Spec 2B ◆
Specification for the Fabrication of Structural Steel Pipe

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

6th Edition | July 2001 | Reaffirmed: September 2020
Product Number: G02B06 | Price: $103.00

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Spec 2B *
Specification for the Fabrication of Structural Steel Pipe—Chinese

Chinese translation of Spec 2B.

6th Edition | July 2001 | Reaffirmed: September 2020
Product Number: G02B06C | Price: $103.00

Spec 2B *
Specification for the Fabrication of Structural Steel Pipe—Russian

Russian translation of Spec 2B.

6th Edition | July 2001 | Reaffirmed: September 2020
Product Number: G02B06R | Price: $103.00

Spec 2C ◆
Offshore Pedestal-Mounted Cranes
(includes Errata 1 dated June 2021)

Provides requirements for design, construction, and testing of offshore pedestal mounted cranes. Offshore cranes are defined in this specification as pedestal mounted elevating and rotating lift devices for transfer of materials or personnel to or from marine vessels and structures. Offshore cranes are typically mounted on a fixed (bottom supported) or floating platform structure used in drilling and production operations. 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: 150

8th Edition | October 2020 | Product Number: G02C08 | Price: $200.00

RP 2D
Operation and Maintenance of Offshore Cranes
(includes Errata 1 dated August 2015 and Addendum 1 dated October 2020)

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: $180.00

RP 2D-2
Training for Offshore Pedestal-Mounted Crane Riggers, Operators, and Inspectors

Enhances the robustness of previous test programs an improved hands-on style of testing that will strengthen competency and understanding of safety protocols. This standard establishes general principles for the training of personnel for safe operations and maintenance of offshore pedestal-mounted cranes, as a companion to API 2D and API 2C. This standard also provides requirements and recommendations for personnel seeking qualification as a crane rigger, operator, or inspector. The revised training requirements in API 2D-2 will help enhance worker safety at offshore sites, with the goal of improving industry safety by reducing the number of drop incidents while boosting productivity and working to eliminate the economic losses that stem from damage. API 2D-2 means all around improvements when it comes to operational safety, maintenance, and sustainability of pedestal-based cranes, improving the overall lifespan of these key pieces of lifting hardware. Pages: 57

1st Edition | October 2020 | Product Number: G02D21 | Price: $87.00

RP 2EQ/ISO 19901-2:2004
Seismic Design Procedures and Criteria for Offshore Structures
(includes Addendum 1 dated January 2019)

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 | Reaffirmed: January 2021
Product Number: GG2EQ01 | Price: $155.00

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

6th Edition | June 1997 | Reaffirmed: September 2020
Product Number: G02F06 | Price: $112.00

Spec 2F *
Specification for Mooring Chain—Chinese

Chinese translation of Spec 2F.

6th Edition | June 1997 | Reaffirmed: September 2020
Product Number: G02F06C | Price: $112.00

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 14J, and with the operator's safety management system as described in RP 75. Pages: 63

1st Edition | April 2006 | Reaffirmed: September 2020
Product Number: G2FB01 | Price: $196.00

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TR 2FC-1
Studlink and Studless Fatigue Curves for Mooring Lines

Summarizes the derivation of fatigue curves for studless and studlink chain mooring lines for inclusion in API 2SK, 3rd Edition. The 2nd of API 2SK has a single fatigue curve for mooring chain; this curve is a non-unique lower bound to all of the in-water and in-air studlink fatigue test data. API 2SK, 2nd Edition does not have separate fatigue curves for studlink and studless chain. The studlink fatigue curve derived in this report is based on the salt water tension-tension fatigue tests performed by the National Engineering Laboratory, Glasgow, UK (NEL) and Exxon Production Research Company (EPR) on oil rig quality (ORQ) studlink chain with bar diameters of 2 in., 3 in., and 4 in. The studless fatigue curve is based on the saltwater tension-tension fatigue tests performed by NEL on R3 and R4 studless chain with a bar diameter of 3 in. Pages: 32

1st Edition | January 2020 | Product Number: G02FC101 | Price: $91.00

TR 2FC-2
Fatigue TN Curves for Chain, Wire, and Polyester Mooring Lines (Including Corrections for High-tension Ranges)

Summarizes the derivation of high-load, range-low cycle corrections to API 2SK, 3rd Edition studlink and studless chain fatigue curves, and in this respect supplements the derivation of standard fatigue curves reported in API 2FC-1, 1st Edition. In addition, low cycle high load range corrections to API 2SK's independent wire rope core (IWRC) and spiral strand (SS) wire rope fatigue curves are proposed, and polyester rope fatigue data is reviewed and compared to the recommendations presently contained in API 2SM, API 2SK, and ISO 19901-7. The proposed corrections to the API TN curves and chain and polyester fatigue test data are provided; where the lower part of the piecewise linear TN curves (in the log-log space) are the same as in API 2SK, while the upper part is the correction, or change, proposed. Pages: 26

1st Edition | January 2020 | Product Number: G02FC201 | Price: $79.00

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 | Reaffirmed: September 2020
Product Number: G2FPS02 | Price: $231.00

RP 2FSIM
Floating Systems Integrity Management

Provides guidance for floating system integrity management (FSIM) of floating production systems (FPSs), which include tension leg platforms (TLPs), used by the petroleum and natural gas industries to support drilling, production, storage, and/or offloading operations.

FPSs described in this recommended practice are governed by local regulatory requirements and recognized classification society (RCS) rules (if classed). No specific regulatory compliance or RCS requirements are restated in this RP. The requirements of this RP do not apply to mobile offshore drilling units (MODUs) or to mobile offshore units (MOUs) used in support of construction operations. For integrity management (IM) considerations, these units are typically governed by RCS rules. Pages: 101

1st Edition | September 2019
Product Number: G2FSIM01| Price: $212.00

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 | Reaffirmed: January 2021
Product Number: GG2GEO01 | Price: $192.00

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: 24

9th Edition | July 2006 | Effective Date: February 1, 2007
Reaffirmed: September 2020 | Product Number: G02H09 | Price: $117.00

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: $103.00

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 are included;
- special guidance for MODU mooring inspection in the areas of tropical cyclone is provided.

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

3rd Edition | April 2008 | Reaffirmed: September 2020
Product Number: G02I03 | Price: $183.00

■ 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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RP 2MET
Derivation of Metocean Design and Operating Considerations

Gives general requirements for the determination and use of meteorological and oceanographic (metocean) conditions for the design, construction and operation of offshore structures of all types used 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 are:

- 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 for the design of new structures;
- the determination of actions 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 facility operations, where appropriate. Pages: 280

2nd Edition | November 2019
Product Number: GG2MET02 | Price: $274.00

RP 2MIM
Mooring Integrity Management

Provides guidance for the integrity management (IM) of mooring systems connected to a permanent floating production system (FPS) used for the drilling, development, production, and/or storage of hydrocarbons in offshore areas. The scope of this recommended practice (RP) extends from the anchor to the connection to the floating unit (e.g. chain stopper) and includes components critical to the mooring system (e.g. turret bearings, fairleads, chain stoppers, anchors, suction piles).

Specific guidance is provided for the inspection, monitoring, evaluation of damage, fitness-for-service assessment, risk reduction, mitigation planning, and the process of decommissioning. This RP incorporates and expands on the IM recommendations found in API 2I and API 2SK. In the event of any discrepancy between API 2MIM and API 2I/API 2SK, API 2I/API 2SK will govern. Pages: 83

1st Edition | September 2019
Product Number: G2MIM01 | Price: $165.00

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: January 2021
Product Number: GG2MOP1 | Price: $301.00

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 | Reaffirmed: January 2021
Product Number: G02N03 | Price: $247.00

TR 2PY
Effect of Best-Estimate Geotechnical p-y Curves on Performance of Offshore Structures

Performs structural analyses using soil models developed by 2GEO, 1st Edition criteria and 2GEO, 2nd Edition draft criteria to determine the effect of the new clay soil p-y formulations on the structural responses of these platforms. The predicted responses were then compared with measured or observed platform performance in field. Pages: 89

1st Edition | February 2020 | Product Number: G2PY01 | Price: $127.00

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 17J. Pages: 81

2nd Edition | September 2013 | Reaffirmed: September 2020
Product Number: G2RD02 | Price: $304.00

RP 2RIM
Integrity Management of Risers from Floating Production Facilities

Provides guidance for the integrity management (IM) of risers connected to a permanent floating production system (FPS) used for the drilling, development, production, and storage of hydrocarbons in offshore areas.

For the purposes of this recommended practice, a riser has a top boundary that is somewhere at or above the point where it transfers load to the platform structure, and it has a lower boundary where it transfers load into a foundation, which could be a wellhead, pipeline, or subsea structure. Pages: 72

1st Edition | September 2019
Product Number: G2RIM01 | Price: $165.00

To purchase individual API standards, visit apiwebstore.org

Bull 2S
Design of Windlass Wildcats for Floating Offshore Structures

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

2nd Edition | November 1995 | Reaffirmed: January 2001
Product Number: G02S02 | Price: $94.00

Spec 2SC ◆
Manufacture of Structural Steel Castings for Primary Offshore Applications

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

1st Edition | September 2009 | Effective Date: March 1, 2010
Reaffirmed: September 2020 | Product Number: G2SC01 | Price: $142.00

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/mm^2 to 586 N/mm^2 (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 | Reaffirmed: September 2020
Product Number: G2SF01 | Price: $107.00

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 | Reaffirmed: September 2020
Product Number: G2SIM01 | Price: $212.00

RP 2SK ■
Design and Analysis of Stationkeeping Systems for Floating Offshore Structures

Addresses the design and analysis of stationkeeping systems (mooring systems with or without thruster assistance) in conditions from survival to operational. Different design requirements for mobile and permanent moorings are provided. Pages: 157

4th Edition | February 2024 | Product Number: G2SK04 | Price: $153.00

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 offloading 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 | Reaffirmed: September 2020
Product Number: G2SM02 | Price: $230.00

RP 2T
Planning, Designing and Constructing Tension Leg Platforms

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

3rd Edition | July 2010 | Reaffirmed: June 2015
Product Number: G02T03 | Price: $281.00

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

Addresses the need to evaluate the tie-downs in use on offshore production facilities for drilling rigs, permanent equipment, and facilities such as quarters, helidecks, etc. The information contained in this document is presented as recommendations to improve tie-down performance during hurricanes. 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: $65.00

■ 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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RP 2TOP
Topsides Structure

Provides requirements for the design, fabrication, transportation, installation, modification, and structural integrity management for the topsides structure for an oil and gas platform. It complements API 2A-WSD, API 2A-LRFD, ISO 19903, API 2FPS, API 2T, ISO 19905 1, and API 2N, which give requirements for various forms of substructures. It is based on ISO 19901-3:2010 (Corrected version, 15-Dec-2011) and is consistent with ISO 19901-3:2014. In fact, ISO 19901-3 was followed to the fullest extent possible and modified only where needed to conform to standards and practices of API.

Requirements in API 2TOP concerning modifications and maintenance relate only to those aspects that are of direct relevance to the structural integrity of the topsides structure. Pages: 136

1st Edition | August 2019 | Product Number: G2TOP1 | Price: $189.00

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: $237.00

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: $237.00

Spec 2W ◆
Steel Plates Produced by Thermo-Mechanically Controlled Processing for Offshore Structures

Covers four grades of steel plates that are to be produced by thermo-mechanically controlled processing (TMCP) for use in welded construction of offshore structures. Pages: 27

6th Edition | January 2019 | Product Number: G02W06 | Price: $127.00

Spec 2W *
Steel Plates Produced by Thermo-Mechanically Controlled Processing for Offshore Structures—Russian

Russian translation of Spec 2W.

6th Edition | January 2019 | Product Number: G02W06R | Price: $127.00

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

4th Edition | May 2004 | Reaffirmed: September 2020
Product Number: G02X04 | Price: $182.00

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: September 2020 | Product Number: G02Y05 | Price: $117.00

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 sued as a supplement to other material specifications (e.g. Spec 2H) if so desired. Pages: 19

4th Edition | September 2005 | Reaffirmed: September 2020
Product Number: G02Z04 | Price: $149.00

RP 2Z *
Recommendation Practice for Preproduction Qualification for Steel Plates for Offshore Structures—Russian

Russian translation of RP 2Z.

4th Edition | September 2005 | Reaffirmed: June 2015
Product Number: G02Z04R | Price: $149.00

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

1st Edition | June 2006 | Reaffirmed: September 2020
Product Number: G95J01 | Price: $78.00

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DERRICKS AND MASTS

Spec 4F ◆
Specification for Drilling and Well Servicing Structures
(includes Addendum 1 dated August 2023)

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: 66

5th Edition | June 2020 | Product Number: G04F05 | Price: $164.00

RP 4G
Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures
(includes Addendum 1 dated June 2020 and Addendum 2 dated September 2020)

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 API 54. Items of drilling and well servicing structures covered are masts/derricks, substructures, and their accessories. Pages: 64

5th Edition | February 2019 | Product Number: G04G05 | Price: $152.00

TUBULAR GOODS

RP 5A3
Thread Compounds for Casing, Tubing, Line Pipe, and Drill Stem Elements

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. These test methods are primarily intended for thread compounds formulated with a lubricating base grease and are not applicable to some materials used for lubricating and/or sealing thread connections. It is recognized that many areas can have environmental requirements for products of this type. This standard does not include requirements for environmental compliance. It is the responsibility of the end-user to investigate these requirements and to select, use and dispose of the thread compounds and related waste materials accordingly. Pages: 80

4th Edition | February 2023 | Product Number: GX5A304 | Price: $195.00

RP 5A3 *
Thread Compounds for Casing, Tubing, Line Pipe, and Drill Stem Elements—Ukrainian

Ukrainian translation of RP 5A3.

4th Edition | February 2023 | Product Number: GX5A303U | Price: $195.00

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

7th Edition | June 2005 | Reaffirmed: January 2021
Product Number: GX5A507 | Price: $196.00

RP 5A5/ISO 15463:2003 *
Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe—Chinese
(includes Errata 1 dated December 2009)

Chinese translation of RP 5A5/ISO 15463:2003.

7th Edition | June 2005 | Reaffirmed: January 2021
Product Number: GX5A507C | Price: $196.00

RP 5A5/ISO 15463:2003 *
Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe—Russian
(includes Errata 1 dated December 2009)

Russian translation of RP 5A5/ISO 15463:2003.

7th Edition | June 2005 | Reaffirmed: January 2021
Product Number: GX5A507R | Price: $196.00

RP 5A5/ISO 15463:2003 *
Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe—Ukrainian
(includes Errata 1 dated December 2009)

Ukrainian translation of RP 5A5/ISO 15463:2003.

7th Edition | June 2005 | Reaffirmed: January 2021
Product Number: GX5A507U | Price: $196.00

Spec 5B ◆
Threading, Gauging, and Inspection of Casing, Tubing, and Line Pipe Threads
(includes Errata 1 dated June 2018, Errata 2 dated December 2018, Addendum 1 dated December 2018, Addendum 2 dated December 2019, and Addendum 3 dated January 2021)

Covers dimensions, tolerances, and marking requirements for API threads and the gauges that control the acceptance criteria for the threads. Thread element gauges, instruments, and requirements for the inspection of threads for line pipe, round thread casing, round thread tubing, and buttress casing connections are included. Pages: 116

16th Edition | December 2017 | Product Number: G5B016 | Price: $187.00

Spec 5B *
Threading, Gauging, and Inspection of Casing, Tubing, and Line Pipe Threads—Russian
(includes Errata 1 dated June 2018, Errata 2 dated December 2018, Addendum 1 dated December 2018, and Addendum 2 dated December 2019)

Russian translation of Spec 5B.

16th Edition | December 2017 | Product Number: G5B016R | Price: $187.00

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Spec 5B *
Threading, Gauging, and Inspection of Casing, Tubing, and Line Pipe Threads—Ukrainian
(includes Errata 1 dated June 2018, Errata 2 dated December 2018, Addendum 1 dated December 2018, and Addendum 2 dated December 2019)

Ukrainian translation of Spec 5B.

16th Edition | December 2017 | Product Number: G5B016U | Price: $187.00

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

5th Edition | August 1999 | Reaffirmed: February 2024
Product Number: G05B105 | Price: $177.00

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

Kazakh translation of RP 5B1.

5th Edition | August 1999 | Reaffirmed: February 2024
Product Number: G05B15K | Price: $177.00

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

Russian translation of RP 5B1.

5th Edition | October 1999 | Reaffirmed: February 2024
Product Number: G05B15R | Price: $177.00

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

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

18th Edition | May 1999 | Reaffirmed: July 2020
Product Number: G05C18 | Price: $143.00

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

Chinese translation of RP 5C1.

18th Edition | May 1999 | Reaffirmed: July 2020
Product Number: G05C18C | Price: $143.00

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

Russian translation of RP 5C1.

18th Edition | May 1999 | Reaffirmed: July 2020
Product Number: G05C18R | Price: $143.00

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

Ukrainian translation of RP 5C1.

18th Edition | May 1999 | Reaffirmed: July 2020
Product Number: G05C18U | Price: $143.00

TR 5C3
Calculating Performance Properties of Pipe Used as Casing or Tubing

Illustrates the equations and templates necessary to calculate the various pipe properties, including:

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

For equations related to performance properties, extensive background information is also provided regarding their development and use. Pages: 400

7th Edition | June 2018 | Product Number: G5C307 | Price: $281.00

TR 5C3*
Calculating Performance Properties of Pipe Used as Casing or Tubing—Ukrainian

Ukrainian translation of TR 5C3.

7th Edition | June 2018 | Product Number: G5C307U | Price: $281.00

RP 5C5
Procedures for Testing Casing and Tubing Connections
(includes Addendum 1 dated May 2021)

Defines tests to perform to determine the galling tendency, sealing performance, and structural integrity of threaded casing and tubing connections. The words “casing” and “tubing” apply to the service application and not to the diameter of the pipe. This recommended practice addresses the primary loads to which casing and tubing strings are subjected: fluid pressure (internal and/or external), axial force (tension and/or compression), bending (buckling and/or wellbore deviation), and temperature variations. Pages: 197

4th Edition | January 2017 | Product Number: GX5C504 | Price: $224.00

RP 5C5 *
Procedures for Testing Casing and Tubing Connections—Russian
(includes Addendum 1 dated May 2021)

Russian translation of RP 5C5.

4th Edition | January 2017 | Product Number: GX5C504R | Price: $224.00

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RP 5C6
Pipe with Welded Connectors

Provides a practice for facility or field welding of connectors to pipe. The technical content contains guidance and requirements for welding procedure qualification, welder performance qualification, materials, testing, production welding, and inspection. Additionally, this standard covers the weld fabrication of connectors and handling attachments such as lift eyes and landing pads to pipe. This standard also includes practices used within industry and is intended to be analogous to API 6A PSL 1, with additional requirements specific to the equipment fabrication. Pages: 28

3rd Edition | May 2018 | Reaffirmed: August 2024
Product Number: G05C63 | Price: $118.00

RP 5C6 *
Pipe with Welded Connectors—Russian

Russian translation of RP 5C6.

3rd Edition | May 2018 | Reaffirmed: August 2024
Product Number: G05C63R | Price: $118.00

RP 5C8
Care, Maintenance, and Inspection of Coiled Tubing

Covers the care, maintenance, and inspection of used low alloy carbon steel coiled tubing. Commonly manufactured coiled tubing outside diameters range from 25.4 mm (1.000 in.) to 88.9 mm (3.5 in.). Pages: 122

1st Edition | January 2017 | Product Number: G05C801 | Price: $150.00

Spec 5CRA/ISO 13680:2020 ◆
Corrosion-Resistant Alloy Seamless Products for Use as Casing, Tubing, Coupling Stock, and Accessory Material

Specifies the technical delivery conditions for corrosion-resistant alloy seamless products for casing, tubing, coupling stock, and accessory material (including coupling stock and accessory material from bar) for two product specification levels: PSL-1, which is the basis of this document, and PSL-2, which provides additional requirements for a product that is intended to be both corrosion and cracking resistant for the environments and qualification method specified in Annex G and in the ISO 15156:2020 series. Pages: 152

2nd Edition | October 2022 | Effective Date: April 1, 2023
Product Number: G5CRA02 | Price: $213.00

Spec 5CT ◆
Casing and Tubing
(includes Errata 1 dated May 2024 and Errata 2 dated August 2024)

Specifies the technical delivery conditions for steel pipes (casing, tubing, and pup joints), coupling stock, coupling material, and accessory material. For products covered by this standard, the sizes, masses, and wall thicknesses, as well as grades and applicable end-finishes, are provided. API 5L pipe may be ordered as casing in accordance with API 5C6. By agreement between the purchaser and the manufacturer, this standard can also be applied to other plain-end pipe sizes and wall thicknesses. Pages: 151

11th Edition | December 2023 | Effective December 19, 2024
Product Number: G5CT11 | Price: $345.00

Spec 5CT *■
Casing and Tubing—Chinese
(includes Errata 1 dated May 2024 and Errata 2 dated August 2024)

Chinese translation of Spec 5CT.

11th Edition | December 2023
Product Number: G5CT11CH | Price: $345.00

Spec 5DP ◆
Drill Pipe
(includes Errata 1 dated July 2020)

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: 133

2nd Edition | May 2020 | Product Number: G5DP02 | Price: $245.00

Spec 5DP *
Drill Pipe—Russian
(includes Errata 1 dated July 2020)

Russian translation of Spec 5DP.

2nd Edition | May 2020 | Product Number: G5DP02R | Price: $245.00

RP 5EX
Design, Verification, and Application of Solid Expandable Systems

Establishes guidance for design, system verification, and application guidelines of solid expandable systems for the oil and gas industries. This document is not to be used as a specification for purchasing equipment; it is intended for consideration by users for well applications and design of solid expandable systems.

Expandable systems will include drilling liners, hangers, connections, receivers, and launchers for downhole use as defined herein. Only permanently installed equipment/components are covered by this recommended practice. Slotted liners and tools used for the expansion of the tubular goods (such as, but not limited to, implementation tools, pumps, jacks, and expansion tools) are not addressed by this recommended practice. Pages: 54

1st Edition | May 2018 | Reaffirmed: February 2024
Product Number: G5EX01 | Price: $130.00

TR 5HIC ■
Defining Hydrogen-Induced Cracking Test Criteria for Commodity-Grade Line Pipe in Less Severe Sour Conditions

Supports the development of a moderate sour service commodity grade under Spec 5L:2018 Annex H, while maintaining harmonization with ISO 15156 and NACE TM0284:2016 as regards to resistance testing to hydrogen-induced cracking (HIC). To define the HIC test conditions and exposure duration needed for that purpose, the impact of varying test durations on the extent of cracking in less severe sour test environments was specifically assessed in solutions containing 1 % to 10 % H_2S within pH values 3.5 to 4.5. For the series of HIC tests conducted, sweet service test material from two different pipes was used, which showed different susceptibility to cracking in moderate sour conditions. Pages: 39

1st Edition | August 2024 | Product Number: G5HIC01 | Price: $112.00

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Spec 5L ◆
Line Pipe
(includes Errata 1 dated May 2018)

Specifies requirements for the manufacture of two product specification levels (PSL 1 and PSL 2) of seamless and welded steel pipes for use in pipeline transportation systems in the petroleum and natural gas industries. This specification is not applicable to cast pipe. Pages: 210

46th Edition | April 2018 | Effective Date: November 1, 2018
Product Number: G05L46 | Price: $353.00

Spec 5L *
Line Pipe—Chinese
(includes Errata 1 dated May 2018)

Chinese translation of Spec 5L.

46th Edition | April 2018 | Product Number: G05L46C | Price: $353.00

Spec 5L *
Line Pipe—Russian
(includes Errata 1 dated May 2018)

Russian translation of Spec 5L.

46th Edition | April 2018 | Product Number: G05L46R | Price: $353.00

RP 5L1
Recommended Practice for Railroad Transportation of Line Pipe

Applies to the transportation on railcars of Spec 5L steel line pipe in sizes $2^3/_8$ and larger in lengths longer than single random. These recommendations cover coated or uncoated pipe, but they do not encompass loading practices designed to protect pipe coating from damage. Pages: 5

7th Edition | September 2009 | Reaffirmed: February 2024
Product Number: G5L107 | Price: $75.00

RP 5L1 *
Recommended Practice for Railroad Transportation of Line Pipe—Russian

Russian translation of RP 5L1.

7th Edition | September 2009 | Reaffirmed: February 2024
Product Number: G5L107R | Price: $75.00

RP 5L1 *
Recommended Practice for Railroad Transportation of Line Pipe—Ukrainian

Ukrainian translation of RP 5L1.

7th Edition | September 2009 | Reaffirmed: February 2024
Product Number: G5L107U | Price: $75.00

RP 5L3
Drop-Weight Tear Tests on Line Pipe
(includes Addendum 1 dated October 2020 and Errata 1 dated March 2021)

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 | Reaffirmed: October 2020
Product Number: G5L304 | Price: $118.00

RP 5L3 *
Drop-Weight Tear Tests on Line Pipe—Russian
(includes Addendum 1 dated October 2020 and Errata 1 dated March 2021)

Russian translation of RP 5L3.

4th Edition | August 2014 | Reaffirmed: October 2020
Product Number: G5L304R | Price: $118.00

RP 5L3 *
Drop-Weight Tear Tests on Line Pipe—Ukrainian
(includes Addendum 1 dated October 2020 and Errata 1 dated March 2021)

Ukrainian translation of RP 5L3.

4th Edition | August 2014 | Reaffirmed: October 2020
Product Number: G5L304U | Price: $118.00

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

2nd Edition | December 1996 | Reaffirmed: May 2015
Product Number: G05L82 | Price: $155.00

RP 5L8 *
Recommended Practice for Field Inspection of New Line Pipe—Kazakh

Kazakh translation of RP 5L8.

2nd Edition | December 1996 | Reaffirmed: May 2015
Product Number: G05L82K | Price: $155.00

RP 5L8 *
Recommended Practice for Field Inspection of New Line Pipe—Russian

Russian translation of RP 5L8.

2nd Edition | December 1996 | Reaffirmed: May 2015
Product Number: G05L82R | Price: $155.00

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

4th Edition | March 2015 | Effective Date: September 3, 2015
Reaffirmed: July 2020 | Product Number: G5LC04 | Price: $217.00

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Spec 5LC *
CRA Line Pipe—Russian
(includes Errata 1 dated October 2015)

Russian translation of Spec 5LC.

4th Edition | March 2015 | Reaffirmed: July 2020
Product Number: G5LC04R | Price: $217.00

Spec 5LCP ◆
Specification on Coiled Line Pipe
(includes Errata 1 dated July 2007)

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

2nd Edition | October 2006 | Effective Date: April 18, 2007
Reaffirmed: July 2020 | Product Number: G5LCP2 | Price: $181.00

Spec 5LCP *
Specification on Coiled Line Pipe—Chinese
(includes Errata 1 dated July 2007)

Chinese translation of Spec 5LCP.

2nd Edition | October 2006 | Reaffirmed: July 2020
Product Number: G5LCP2C | Price: $181.00

Spec 5LCP *
Specification on Coiled Line Pipe—Russian
(includes Errata 1 dated July 2007)

Russian translation of Spec 5LCP.

2nd Edition | October 2006 | Reaffirmed: July 2020
Product Number: G5LCP2R | Price: $181.00

Spec 5LD ◆
CRA Clad or Lined Steel Pipe
(includes Errata 1 dated June 2017 and Addendum 1 dated February 2024)

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

4th Edition | March 2015 | Effective Date: September 3, 2015
Reaffirmed: July 2020 | Product Number: G5LD04 | Price: $180.00

Spec 5LD *
CRA Clad or Lined Steel Pipe—Russian
(includes Errata 1 dated June 2017 and Addendum 1 dated February 2024)

Russian translation of Spec 5LD.

4th Edition | March 2015 | Reaffirmed: July 2020
Product Number: G5LD04R | Price: $180.00

RP 5LT
Recommended Practice for Truck Transportation of Line Pipe

Applies to the transportation on railcars of Spec 5L steel line pipe in sizes $2^3/_8$ and larger in lengths longer than single random. These recommendations cover coated or uncoated pipe, but they do not encompass loading practices designed to protect pipe coating from damage. Pages: 6

1st Edition | March 2012 | Reaffirmed: April 2024
Product Number: G5LT01 | Price: $75.00

RP 5LT *
Recommended Practice for Truck Transportation of Line Pipe—Chinese

Chinese translation of RP 5LT.

1st Edition | March 2012 | Reaffirmed: April 2024
Product Number: G5LT01C | Price: $75.00

RP 5LT *
Recommended Practice for Truck Transportation of Line Pipe—Russian

Russian translation of RP 5LT.

1st Edition | March 2012 | Reaffirmed: April 2024
Product Number: G5LT01R | Price: $75.00

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

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

3rd Edition | September 2009 | Reaffirmed: May 2015
Product Number: G5LW03 | Price: $75.00

RP 5LW *
Recommended Practice for Transportation of Line Pipe on Barges and Marine Vessels—Russian

Russian translation of RP 5LW.

3rd Edition | September 2009 | Reaffirmed: May 2015
Product Number: G5LW03R | Price: $75.00

RP 5LW *
Recommended Practice for Transportation of Line Pipe on Barges and Marine Vessels—Ukrainian

Ukrainian translation of RP 5LW.

3rd Edition | September 2009 | Reaffirmed: May 2015
Product Number: G5LW03U | Price: $75.00

RP 5MT
Pipeline Inspection Documents for Material Traceability and Electronic Test Reports

Provides a method for the electronic exchange of MTR inspection documents from manufacturer to purchaser to support enhanced material traceability and records for steel line pipe, and could be applied to related steel assets. Pages: 21

1st Edition | September 2021 | Product Number: G5MT01 | Price: $85.00

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Spec 5ST ◆
Specification for Coiled Tubing—U.S. Customary and SI Units
(includes Addendum 1 dated February 2024)

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 | Reaffirmed: July 2020
Product Number: G5ST01 | Price: $166.00

Spec 5ST *
Specification for Coiled Tubing—U.S. Customary and SI Units—Chinese
(includes Addendum 1 dated February 2024)

Chinese translation of Spec 5ST.

1st Edition | April 2010 | Reaffirmed: July 2020
Product Number: G5ST01C | Price: $166.00

Spec 5ST *
Specification for Coiled Tubing—U.S. Customary and SI Units—Russian
(includes Addendum 1 dated February 2024)

Russian translation of Spec 5ST.

1st Edition | April 2010 | Reaffirmed: July 2020
Product Number: G5ST01R | Price: $166.00

Bull 5T1
Imperfection and Defect Terminology

Provides terms and definitions and example figures of imperfections and defects that occur in manufacturing steel tubulars. The words "imperfection" and "defect" refer to metallurgical and other features of steel tubular products, which may or may not affect the performance of the products. Inspection requirements and acceptance criteria are not defined in this document, and are found instead in the respective product specification. Pages: 65

11th Edition | October 2017 | Product Number: G05T111 | Price: $158.00

Bull 5T1 *
Imperfection and Defect Terminology—Russian

Russian translation of Bull 5T1.

11th Edition | October 2017 | Product Number: G05T111R | Price: $158.00

Bull 5T1 *
Imperfection and Defect Terminology—Ukrainian

Ukrainian translation of Bull 5T1.

11th Edition | October 2017 | Product Number: G05T11U | Price: $158.00

TR 5TP
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: G5TP01 | Price: $143.00

TR 5TP *
Torque-Position Assembly Guidelines for API Casing and Tubing Connections—Russian

Russian translation of TR 5TP.

1st Edition | December 2013 | Product Number: G5TP01R | Price: $143.00

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

Covers the supplemental requirements for Enhanced Leak Resistance LTC (SC22) connections and the changes in 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: $110.00

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

2nd Edition | June 2005 | Reaffirmed: July 2020
Product Number: G5UE02 | Price: $99.00

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

Russian translation of RP 5UE.

2nd Edition | June 2005 | Reaffirmed: July 2020
Product Number: G5UE02R | Price: $99.00

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VALVES AND WELLHEAD EQUIPMENT

Spec 6A ◆
Specification for Wellhead and Tree Equipment
(includes Errata 1 dated April 2019, Errata 2 dated June 2020, Addendum 1 dated July 2020, Errata 3 dated September 2020, Addendum 2 dated June 2021, Errata 4 dated September 2021, Addendum 3 dated August 2022, Addendum 4 dated November 2024, Errata 5 dated May 2024, and Errata 6 dated October 2024)

Specifies requirements for the performance, dimensional and functional interchangeability, design, materials, testing, inspection, welding, marking, handling, storing, shipment, purchasing, repair, and remanufacture of wellhead and 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 (integral, blind, and test flanges; ring gaskets; threaded connectors; tees and crosses; bullplugs; valve-removal plugs; standard and nonstandard top connectors; crossover connectors; other end connectors; adapter spools and spacer spools; gate, plug, and ball valves; actuated valves [manual and remote]; check valves [swing- and lift-type]; back-pressure valves; slip-type and mandrel-type casing and tubing hangers, casing and tubing heads [housings and adapters]; chokes [fixed, manually actuated, remotely actuated]; actuators [for valves and chokes]; surface safety valve (SSV) assemblies, valves prepared for actuators, and actuators; underwater safety valve [USV] assemblies, valves prepared for actuators, and actuators; boarding shutdown valve [BSDV] assemblies, valves prepared for actuators, and actuators; and tree assemblies).

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 four product specification levels (PSL). These four PSL designations define different levels of technical quality requirements. Pages: 414

21st Edition | November 2018 | Effective Date: November 1, 2019
Product Number: GX06A21 | Price: $355.00

Spec 6A *
Specification for Wellhead and Tree Equipment—Chinese
(includes Errata 1 dated April 2019, Errata 2 dated June 2020, Addendum 1 dated July 2020, Errata 3 dated September 2020, Addendum 2 dated June 2021, Errata 4 dated September 2021, Addendum 3 dated August 2022, Addendum 4 dated November 2024, Errata 5 dated May 2024, and Errata 6 dated October 2024)

Chinese translation of Spec 6A.

21st Edition | November 2018
Product Number: GX06A21C | Price: $355.00

Spec 6A *
Specification for Wellhead and Tree Equipment—Russian
(includes Errata 1 dated April 2019, Errata 2 dated June 2020, Addendum 1 dated July 2020, Errata 3 dated September 2020, Addendum 2 dated June 2021, Errata 4 dated September 2021, Addendum 3 dated August 2022, Addendum 4 dated November 2024, Errata 5 dated May 2024, and Errata 6 dated October 2024)

Russian translation of Spec 6A.

21st Edition | November 2018
Product Number: GX06A21R | Price: $355.00

Std 6ACRA
Age-Hardened Nickel-Based Alloys for Oil and Gas Drilling and Production Equipment
(includes Errata 1 dated October 2015, Addendum 1 dated September 2017, Errata 2 dated February 2018, Addendum 2 dated September 2018, and Addendum 3 dated February 2019)

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 5CRA.

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 | $108.00

Std 6ACRA *
Age-Hardened Nickel-Based Alloys for Oil and Gas Drilling and Production Equipment—Russian
(includes Errata 1 dated October 2015, Addendum 1 dated September 2017, Errata 2 dated February 2018, Addendum 2 dated September 2018, and Addendum 3 dated February 2019)

Russian translation of Std 6ACRA.

1st Edition | August 2015 | Product Number: G6ACRA1R | $108.00

TR 6AF
Technical Report on Capabilities of API Flanges Under Combinations of Load
(includes Errata 1 dated March 2017)

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 model for each of the four load cases. A post-processor program was written to calculate the maximum moment capacity for various levels of pressure and tension, based on linear superposition of results. Three different criteria were used to establish the maximum moment:

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

The results of this post-processing are presented in plots of pressure vs. allowable moment for various tension levels. Limitations to this work include: the effects of transverse shear or torsion were not considered in the analysis; dynamic, fatigue, or fretting phenomena were not considered in these results; and thermal stresses or elevated temperature effects were not considered. The charts are intended to be used only as general guidelines for design. These charts are not intended to replace a critical evaluation of any particular connection in an application where the charts show the flange to be marginal. Pages: 79

3rd Edition | September 2008 | Product Number: G6AF03 | Price: $187.00

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TR 6AF *
Technical Report on Capabilities of API Flanges Under Combinations of Load—Russian
(includes Errata 1 dated March 2017)

Russian translation of TR 6AF.

3rd Edition | September 2008 | Product Number: G6AF03R | Price: $187.00

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

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

2nd Edition | November 1998 | Product Number: G06AF1 | Price: $196.00

TR 6AF2
Technical Report on Capabilities of API Integral Flanges Under Combination of Loading—Phase II
(includes Errata 1 dated November 2018)

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: $212.00

RP 6AF3 ■
High-Pressure High-Temperature (HPHT) Flange Design Methodology

Provides design guidelines for API 6BX style flanges utilized as end and outlet connectors in high-pressure, high-temperature (HPHT) surface and subsea applications. For this document, HPHT applications are intended to mean flanges assigned a temperature rating greater than 350 °F or a pressure rating greater than 15,000 psi. Pages: 35

2nd Edition | May 2024 | Product Number: G6AF32 | Price: $101.00

Std 6AR
Repair and Remanufacture of Wellhead and Tree Equipment

Identifies the requirements for repair and remanufacture of wellhead and tree equipment under a quality management system and manufactured in conformance with API 6A for continued service when specified by the user/purchaser of the equipment.

This standard applies to equipment manufactured to editions of API 6A in which a product specification level (PSL) identifies the quality, material, and testing requirements for a specific product. Equipment identified as manufactured in conformance with API 6A prior to April 1986 (API 6A, 15th Edition) is outside the scope of this document. A repair and remanufacture specification level (RSL) is designated to provide the appropriate quality control requirements for the repair and remanufacture of wellhead and tree equipment under this standard. Pages: 25

2nd Edition | September 2019 | Product Number: G6AR02 | Price: $91.00

Spec 6AV1 ◆
Validation of Safety and Shutdown Valves for Sandy Service

There are three service classes—Class I, Class II, and Class III—for API 6A surface safety valve (SSV), underwater safety valve (USV), or boarding shutdown valve (BSDV). This standard establishes sandy service design validation for valves to meet Class II and Class III.

Class II is intended to validate the valve bore sealing mechanism if substances such as sand can be expected to cause safety or shutdown valve failure.

Class III adds additional requirements and validation of the bonnet assembly inclusive of stem seals and may be selected by the user/purchaser. Validation to Class III also validates the same SSV/USV/BSDV for Class II in accordance with scaling limitations specified in the document. Pages: 32

3rd Edition | July 2018 | Product Number: G6AV103 | Price: $120.00

Std 6AV2
Installation, Maintenance, and Repair of Safety Valves (SSV, USV, and BSDV)

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 API 14C. This standard is the revision of and supersedes RP 14H, 5th Edition. Pages: 36

2nd Edition | August 2020 | Product Number: G6AV202 | Price: $183.00

Spec 6D ◆
Specification for Valves
(includes Errata 1 dated December 2021, Errata 2 dated October 2023, Addendum 1 dated April 2023, and Addendum 2 dated September 2024)

Defines the requirements for the design, manufacturing, materials, welding, quality control, assembly, testing, marking, documentation, and process controls of axial, ball, check, gate, and plug valves for application in the natural gas and petroleum industry. The specification is used on a global scale to help ensure access to reliable and sustainable energy, and supports UN Sustainable Development Goal 9, Resilient Infrastructure. The title was updated to reflect its broad use and applicability in the natural gas and petroleum industry. Pages: 173

25th Edition | November 2021 | Product Number: G6D025 | Price: $206.00

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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 valves. The owner is responsible for the correct application of valves repaired or remanufactured per this document. It does not cover repair or remanufacture of used or surplus valves intended for resale. Furthermore, field repair is outside the scope of this document. Pages: 11

2nd Edition | May 2012 | Reaffirmed: January 2020
Product Number: G06DR2 | Price: $97.00

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

Russian translation of Spec RP 6DR.

2nd Edition | May 2012 | Reaffirmed: January 2020
Product Number: G06DR2R | Price: $97.00

Spec 6DSS ◆
Specification for Subsea Pipeline Valves
(includes Errata 1 dated May 2018, Errata 2 dated July 2018, Addendum 1 dated April 2019, and Addendum 2 dated June 2022)

Defines the requirements for the design, manufacturing, quality control, assembly, testing, and documentation of ball, check, gate, plug, and axial on-off valves for application in subsea pipeline systems for the petroleum and natural gas industries. The document contains requirements for both full-opening and reduced-opening valves.

Valves covered by this specification include one of the following pressure classes: Class 150, Class 300, Class 600, Class 900, Class 1500, or Class 2500. This specification is not applicable to valves for pressure ratings exceeding Class 2500. Pages: 130

3rd Edition | August 2017 | Product Number: G6DSS3 | Price: $204.00

Spec 6DSS *
Specification for Subsea Pipeline Valves—Russian
(includes Errata 1 dated May 2018, Errata 2 dated July 2018, Addendum 1 dated April 2019, and Addendum 2 dated June 2022)

Russian translation of Spec 6DSS.

3rd Edition | August 2017 | Product Number: G6DSS3R | Price: $204.00

Std 6DSSX
Operator and Mounting Kits for Subsea Valves
(includes Errata 1 dated May 2021)

Defines the requirements for design, mechanical integrity, and sizing of operators and related components used on subsea pipeline valves that conform to API Spec 6DSS. This standard is applicable to the following: electric actuators; electro-hydraulic actuators; hydraulic actuators; actuator override systems; diver and remotely operated tool (ROT)-operated gearboxes; other actuators, by agreement; mounting kit; pressure and volume compensation and associated systems; pressure caps; protection covers; and electrohydraulic position indication systems. Pages: 105

1st Edition | March 2021 | Product Number: G6DSSX1 | Price: $179.00

Std 6DX
Standard for Actuators and Mounting Kits for Valves
(includes Addendum 1 dated March 2023 and Errata 1 dated April 2023)

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 sub-sea service, handheld powered devices, stand-alone manually operated gearboxes, instrument tubing and associated fittings, and actuator control equipment. Pages: 44

2nd Edition | February 2020 | Product Number: G6DX02 | Price: $189.00

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

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 appendixes present the analytical procedures used to generate performance prediction. Pages: 29

3rd Edition | April 1999 | Product Number: G06F13 | Price: $143.00

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: $135.00

Std 6FA
Standard for Fire Test of Valves
(includes Errata 1 dated August 2020 and Errata 2 dated August 2020)

Establishes the requirements for testing and evaluating the pressure-containing performance of API 6A and API 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 standard applies to valves with one or more closure members. Pages: 36

5th Edition | May 2020 | Product Number: G06FA5 | Price: $132.00

Std 6FB
Standard for Fire Test for End Connectors

Establishes procedures for testing and evaluating the pressure-containing performance of API end connectors when exposed to fire. Valves, wellhead seals, or other related equipment are not included in the scope of this document. The performance requirements of this standard establish standard qualification criteria for all sizes and pressure ratings of end connectors.

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. Pages: 27

4th Edition | May 2019 | Product Number: G06FB4 | Price: $91.00

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RP 6HT
Heat Treatment and Testing of Carbon, Micro-Alloyed, and Low Alloy Steel Wrought and Cast Components

Provides recommended practices for batch-type heat treatment, continuous-type heat treatment, and processing of qualification testing coupons (QTCs) for carbon, micro-alloyed, and low-alloy steel wrought and cast components. It is intended to provide a means for the QTC to represent the properties in a part. Pages: 24

3rd Edition | March 2023 | Product Number: G6HT03 | Price: $117.00

RP 6J
Testing of Oilfield Elastomers

Describes practices for the evaluation of elastomeric seal materials and seal designs for the oil and gas industry for wellhead and tree applications. It can also serve as a general guideline for elastomer materials or elastomer seal members used for other applications, which have similar material and application issues. It is the intent of this document to provide an overview of testing criteria, environments, evaluation procedures, and guidelines for methods used to evaluate elastomeric seal materials and members. Pages: 39

2nd Edition | October 2022 | Product Number: G6J02 | Price: $112.00

TR 6J1
Elastomer Life Estimation Testing Procedures

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

1st Edition | August 2000 | Product Number: G06J11 | Price: $99.00

TR 6MET
Metallic Material Limits for API Equipment Used in High Temperature Applications

Covers testing performed to develop recommended yield strength reduction ratios and elevated temperature properties for a number of steels, stainless steels, and nickel alloys used in oil and gas drilling and production equipment. Pages: 104

3rd Edition | July 2022 | Product Number: G6MET03 | Price: $158.00

TR 6RT
Guidelines for Design and Manufacture of Surface Wellhead Running, Retrieving and Testing Tools, Clean-Out Tools and Wear Bushings

Provides guidance for the design, materials selection, manufacture, and testing of tools and equipment for running, retrieving, clean-out, and testing of wellhead components and wear bushings. The equipment manufactured in accordance with this technical report is designed to satisfy the manufacturer's documented performance characteristics and the applicable service conditions. This technical report is derived from requirements previously found in API 6A, 20th Edition and earlier editions. Pages: 22

1st Edition | February 2020 | Product Number: G06RT1 | Price: $79.00

Std 6X
Design Calculations for Pressure-Containing Equipment

Describes a design analysis methodology and requirements that apply to design verification of certain pressure-containing products and equipment in the oil and natural gas industry. The methods included in this document apply to designs where normative reference to this standard is made in an API product specification and to those components for which the methods of this standard are required or permitted.

Methods are in accordance with the rules of Appendix 4 of the ASME *Boiler and Pressure Vessel Code,* 2004, Section VIII, Division 2. API has adopted slightly different stress limits from the ASME *Boiler and Pressure Vessel Code*, 2004. The criteria used assume defect-free, tough, and ductile material behavior. Pages: 20

2nd Edition | February 2019 | Product Number: G06X02 | Price: $85.00

DRILLING EQUIPMENT

Spec 7-1 ◆
Rotary Drill Stem Elements
(includes Errata 1 dated September 2023)

Specifies the technical delivery conditions for rotary drill stem elements: upper and lower kelly valves, square and hexagonal kellys, drill stem subs, drill collars (steel and non-magnetic, round and spiral), heavy-weight drill pipe (HWDP), drilling and coring bit connections, and stabilizers. This standard is not applicable to drill pipe and tool joints, rotary shouldered connection designs, thread gauging practices, or grand master, reference master, and working gauges, and does not include or identify performance properties. A typical drill stem assembly applicable to this standard is provided. Pages: 125

2nd Edition | February 2023 | Product Number: GX7102 | Price: $217.00

Spec 7-2 ◆
Threading and Gauging of Rotary Shouldered Connections
(includes Errata 1 dated August 2017, Errata 2 dated November 2019, Addendum 1 dated March 2020, and Addendum 2 dated September 2023)

Specifies requirements on rotary shouldered connections for use in petroleum and natural gas industries, including dimensional requirements on threads and thread gauges, stipulations on gauging practice and gauge specifications, as well as instruments and methods for inspection of thread connections. These connections are intended primarily for use in drill-string components.

Other supplementary specifications can be agreed between interested parties for special tolerance requirements, qualification, testing, inspection, and finishing. This standard applies both to newly manufactured connections and connections that are recut after service. It should be realized that recut connections are subject to additional inspection and testing—the user is referred to API 7G-2 for such information.

This standard is applicable to the following preferred rotary shouldered connection designs. These are traceable to an internationally supported system of gauges and calibration that can be described as number (NC) style, regular (REG) style, or full-hole (FH) style. Pages: 114

2nd Edition | January 2017 | Product Number: GX70202 | Price: $236.00

Spec 7-2 *
Threading and Gauging of Rotary Shouldered Connections—Russian
(includes Errata 1 dated August 2017, Errata 2 dated November 2019, Addendum 1 dated March 2020, and Addendum 2 dated September 2023)

Russian translation of Spec 7-2.

2nd Edition | January 2017 | Product Number: GX70202R | Price: $236.00

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TR 7CR
Cold Working Thread Roots with CNC Lathes for Rotary Shouldered Connections

Describes procedures for cold root rolling the thread roots on API 7-2 thread sizes using CNC Lathes (CW/CNC). Cold working can be applied by a couple methods: (1) cold rolling under pressure with a roller shaped like the thread form, or (2) shot peening. Both methods achieve acceptable results, but machine thread root rolling is more controllable. Pages: 49

1st Edition | January 2020 | Product Number: G7CR01 | Price: $91.00

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 | Reaffirmed: July 2020
Product Number: G7CW01 | Price: $107.00

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: July 2022 | Product Number: G7F008 | Price: $144.00

Spec 7F *
Oil Field Chain and Sprockets—Chinese
(includes Errata 1 dated May 2013)

Chinese translation of Spec 7F.

8th Edition | November 2010 | Reaffirmed: July 2022
Product Number: G7F008C | Price: $144.00

RP 7G-1
Drill Stem Performance Properties
(includes Errata 1 dated February 2024 and Errata 2 dated September 2024)

Includes the performance properties for certain drill stem elements and gives general cautions regarding the use of the performance properties. The properties of drill pipe and tool joints, drill collars, heavy weight drill pipe, kellys, rock bits, and lift subs are given. Also provided are the properties of rotary shoulder connections and associated special processes, and break-in steps. Pages: 100

1st Edition | April 2023 | Product Number: G7G-101 | Price: $245.00

RP 7G-2
Inspection and Classification of Used Drill Stem Elements

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. Pages: 227

2nd Edition | October 2020 | Product Number: G7G202 | Price: $192.00

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

1st Edition | May 2009 | Reaffirmed: February 2020
Product Number: H7HU11 | Price: $71.00

Spec 7HU2
Oilfield Hammer Unions

Addresses the incompatibility of hammer union components, a common issue in the industry that has led to equipment mismatching incidents. Its application will serve to improve operations through interoperability of a field proven standard design. This standard specifies minimum requirements for the dimensional and functional interchangeability, design, materials, inspection, marking, storing, and shipment of hammer union parts and assemblies for use in the petroleum and natural gas industries. Pages: 50

1st Edition | March 2022 | Product Number: H7HU21 | Price: $132.00

Spec 7K ◆
Drilling and Well Servicing Equipment
(includes Errata 1 dated May 2016, Errata 2 dated August 2016, and Errata 3 dated October 2017)

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

6th Edition | December 2015 | Product Number: G07K06 | Price: $249.00

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Spec 7K *
Drilling and Well Servicing Equipment—Russian
(includes Errata 1 dated May 2016, Errata 2 dated August 2016, and Errata 3 dated October 2017)

Russian translation of Spec 7K.

6th Edition | December 2015
Product Number: G07K06R | Price: $249.00

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

1st Edition | December 1995 | Effective Date: April 1, 1996
Reaffirmed: August 2019| 2-Year Extension: July 2016
Product Number: G07L01 | Price: $135.00

RP 7L * ■
Procedures for Inspection, Maintenance, Repair, and Remanufacture of Drilling Equipment—Ukrainian
(includes Addendum 1 dated February 2006 and Addendum 2 dated March 2006)

Ukrainian translation of RP 7L.

1st Edition | December 1995 | Reaffirmed: August 2019
Product Number: G7L3A2UK | Price: $135.00

Spec 7NRV ◆
Specification for Drill String Non-Return Valves
(includes Addendum 1 dated December 2019)

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

1st Edition | July 2006 | Reaffirmed: July 2020
Product Number: G7NRV01 | Price: $87.00

Spec 7NRV *
Specification for Drill String Non-Return Valves—Chinese
(includes Addendum 1 dated December 2019)

Chinese translation of Spec 7NRV.

1st Edition | July 2006 | Reaffirmed: July 2020
Product Number: G7NRV01C | Price: $87.00

Spec 7V ■
Drill Stem Valves

Specifies the minimum design requirements for the following drill stem valves: drill pipe float valves, kelly valves, and inside blow out preventers. This specification is intended to give requirements and information to both parties in the selection, manufacture, testing, and use of these valves. The standard addresses requirements that set the minimum parameters with which the supplier/manufacturer will need to comply to claim conformity to this standard. Pages: 41

1st Edition | April 2024 | Product Number: G07V01 | Price: $104.00

HOISTING TOOLS

RP 8B
Recommended Practice for Procedures for Inspection, Maintenance, Repair, and Remanufacture of Hoisting Equipment
(includes Addendum 1 dated March 2019 and Addendum 2 dated July 2021)

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;
- rotary swivel-bail adapters;
- rotary swivels;
- power swivels;
- power subs;
- spiders, if capable of being used as elevators;
- dead-line tie-down/wireline anchors;
- drill-string motion compensators;
- kelly spinners, if capable of being used as hoisting equipment;
- riser-running tool components, if capable of being used as hoisting equipment;
- wellhead-running tool components, if capable of being used as hoisting equipment;
- safety clamps, capable of being used as hoisting equipment;
- top drives;
- casing running tools. Pages: 16

8th Edition | May 2014 | Product Number: G08B08 | Price: $118.00

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Spec 8C ◆
Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)
(includes Errata 1 dated May 2014 and Errata 2 dated November 2020)

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
Reaffirmed: August 2019 | Product Number: GX08C05 | Price: $175.00

Spec 8C *
Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)—Chinese
(includes Errata 1 dated May 2014 and Errata 2 dated November 2020)

Chinese translation of Spec 8C.

5th Edition | April 2012 | Reaffirmed: August 2019
Product Number: GX08C05C | Price: $175.00

Spec 8C *
Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)—Russian
(includes Errata 1 dated May 2014 and Errata 2 dated November 2020)

Russian translation of Spec 8C.

5th Edition | April 2012 | Reaffirmed: August 2019
Product Number: G08C05R | Price: $175.00

RP 8FV1 ■
Field Verification of Rig Devices for Oil and Gas Well Drilling Operations

Contains field verification procedures for critical drilling rig devices used in drilling operations. Its purpose is to promote and maintain the quality and consistency of field verification processes for device management and operational capabilities. Pages: 50

1st Edition | October 2024 | Product Number: G8FV101 | Price: $93.00

WIRE ROPE

Spec 9A ◆
Specification for Wire Rope
(includes Addendum 1 dated May 2023)

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 strand 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 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: 91

27th Edition | August 2020 | Product Number: G9A027 | Price: $158.00

RP 9B
Application, Care, and Use of Wire Ropes for Oil Field Service
(includes Addendum 1 dated August 2020)

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: $150.00

OIL WELL CEMENTS

Spec 10A ◆
Cements and Materials for Well Cementing
(includes Addendum 1 dated November 2019 and Addendum 2 dated August 2022)

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. Pages: 76

25th Edition | March 2019 | Effective Date: September 2019
Product Number: GX10A25 | Price: $197.00

Spec 10A *
Cements and Materials for Well Cementing—Russian
(includes Addendum 1 dated November 2019 and Addendum 2 dated August 2022)

Russian translation of Spec 10A.

25th Edition | March 2019 | Product Number: GX10A25R | Price: $197.00

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Spec 10A *■
Cements and Materials for Well Cementing—Ukrainian
(includes Addendum 1 dated November 2019 and Addendum 2 dated August 2022)

Ukrainian translation of Spec 10A.

25th Edition | March 2019
Product Number: GX10A25UK | Price: $197.00

RP 10B-2 ■
Recommended Practice for Testing Well Cements

Specifies methods and gives recommendations for the testing of cement slurries and related materials under simulated well conditions. Pages: 159

3rd Edition | July 2024 | Product Number: G10B-203 | Price: $293.00

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 deepwater wells, which is addressed in RP 65. Pages: 32

2nd Edition | January 2016 | Reaffirmed: February 2020
Product Number: G10B32 | Price: $118.00

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: $118.00

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

1st Edition | April 2005 | Reaffirmed: August 2020
Product Number: GX10B501 | Price: $100.00

RP 10B-6/ISO 10426-6:2008
Recommended Practice on Determining the Static Gel Strength of Cement Formulations
(includes Addendum 1 dated January 2020)

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: December 2019
Product Number: GG10B601 | Price: $78.00

Spec 10D ◆
Casing Bow-Spring Centralizers

Provides testing, performance, and marking requirements for casing bow-spring centralizers to be used in oil and natural gas well construction. The procedures provide verification testing for the manufacturer's design, materials, and process specifications, and periodic testing to confirm the consistency of product performance. This specification is not applicable to other devices, such as rigid centralizers and cement baskets, or bow-spring centralizers used for other purposes (e.g. wireline tools, gravel pack, inner string). Pages: 36

7th Edition | April 2021 | Product Number: G10D07 | Price: $122.00

RP 10D-2
Centralizer Placement and Stop-Collar Testing

Provides calculations for determining centralizer spacing, based on centralizer performance and desired standoff, in deviated and dogleg holes in wells for the petroleum and natural gas industries. It also provides a procedure for testing stop-collars and reporting test results. Pages: 58

2nd Edition | August 2023 | Product Number: G10D-202 | Price: $100.00

Spec 10F
Cementing Float Equipment Testing
(includes Errata 1 dated May 2020 and Errata 2 dated May 2020)

Provides testing and marking requirements for cementing float equipment to be used in oil and natural gas well construction. Pages: 28

4th Edition | July 2018 | Product Number: GX10F04 | Price: $93.00

Spec 10F *
Cementing Float Equipment Testing—Russian
(includes Errata 1 dated May 2020 and Errata 2 dated May 2020)

Russian translation of Spec 10F.

4th Edition | July 2018 | Product Number: GX10F04R | Price: $93.00

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RP 10G
Product Evaluation, Application, and Testing of Stage Cementing Collars

Provides requirements, guidelines, and recommended practices for stage cementing collars used in cementing applications in the petroleum and natural gas industry. Information is included on the types, application, specification, validation, manufacturing, job planning and execution, and preventing and diagnosing problems. Use of stage cementing collars for non-cementing applications or annulus casing packers, or both, are outside the scope of this document. Products covered under another API or international specification are not included. This document does not cover the connections to the well conduit. Pages: 61

1st Edition | August 2020 | Product Number: G10G01 | Price: $160.00

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: $180.00

TR 10TR1 *
Cement Sheath Evaluation—Kazakh

Kazakh translation of TR 10TR1.

2nd Edition | September 2008
Product Number: G10TR12K | Price: $180.00

TR 10TR1 *
Cement Sheath Evaluation—Russian

Russian translation of TR 10TR1.

2nd Edition | September 2008
Product Number: G10TR12R | Price: $180.00

TR 10TR2
Shrinkage and Expansion in Oilwell Cements

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

1st Edition | July 1997 | Reaffirmed: September 2002
Product Number: G10TR2 | Price: $133.00

TR 10TR2 *
Shrinkage and Expansion in Oilwell Cements—Russian

Russian translation of TR 10TR2.

1st Edition | July 1997 | Reaffirmed: September 2002
Product Number: G10TR2R | Price: $133.00

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: $196.00

TR 10TR3 *
Technical Report on Temperatures for API Cement Operating Thickening Time Tests—Russian

Russian translation of TR 10TR3.

1st Edition | May 1999 | Reaffirmed: May 2005
Product Number: G10TR3R | Price: $196.00

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: $77.00

TR 10TR4 *
Selection of Centralizers for Primary Cementing Operations—Kazakh

Kazakh translation of TR 10TR4.

1st Edition | May 2008 | Product Number: G10TR40K | Price: $77.00

TR 10TR4 *
Selection of Centralizers for Primary Cementing Operations—Russian

Russian translation of TR 10TR4.

1st Edition | May 2008 | Product Number: G10TR40R | Price: $77.00

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: $77.00

TR 10TR5 *
Methods for Testing of Solid and Rigid Centralizers—Kazakh

Kazakh translation of TR 10TR5.

1st Edition | May 2008 | Product Number: G10TR50K | Price: $77.00

TR 10TR5 *
Methods for Testing of Solid and Rigid Centralizers—Russian

Russian translation of TR 10TR5.

1st Edition | May 2008 | Product Number: G10TR50R | Price: $77.00

TR 10TR6
Evaluation and Testing of Mechanical Cement Wiper Plugs

Provides recommended testing, evaluation, and performance requirements for mechanical cement wiper plugs.

Mechanical cementing wiper plugs are used in most application including casing, liners, drill pipe, and tubing for primary and remedial cementing operations where they serve multiple functions in well operations, such as the following:

- separation of fluids inside of pipe,
- wiping of materials from the inner surface of pipe,
- operation of a downhole tool,
- surface indication of a downhole event, and
- formation of a temporary pressure barrier. Pages: 46

1st Edition | July 2015 | Product Number: G10TR601 | Price: $113.00

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TR 10TR7
Mechanical Behavior of Cement

Provides the necessary cement property data for use in cement sheath integrity simulations. The compressive strength tests and nondestructive sonic determination of compressive strength of cement defined in API 10B-2 do not provide suitable data for cement sheath integrity simulations. The methods of API 10B-2 provide information on the strength of cement to ensure that the cement is suitable for general well construction applications and to determine when sufficient strength is developed to allow well operations to continue. Pages: 63

1st Edition | December 2017 | Product Number: G10TR71 | Price: $147.00

RP 65-1
Cementing Shallow-Water Flow Zones in Deepwater Wells

Describes methods designed to prevent shallow-water flow (SWF) during and following cementing of wells located in deep water. It is the compilation of technology and practices developed and used by many operators around the world. Although most of the discussion in this standard is focused on SWF, shallow flows can be mixtures of water, gas, gas hydrates, and formation fines. There is no single method of preventing SWF, and many of the activities described can require customization to fit individual well conditions. Pages: 71

2nd Edition | June 2018 | Product Number: G65102 | Price: $165.00

Std 65-2 ◆
Isolating Potential Flow Zones During Well Construction

Contains best practices for zone isolation in wells to prevent annular pressure and/or flow through or past pressure-containment barriers that are installed and verified during well construction. Well construction practices that may affect barrier sealing performance are mentioned along with methods to help ensure positive effects or to minimize any negative ones. The objectives of this guideline are two-fold. The first is to help prevent and/or control flows just prior to, during, and after primary cementing operations to install or "set" casing and liner pipe strings in wells. 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

2nd Edition | December 2010 | Reaffirmed: November 2016
Product Number: G65202 | Price: $162.00
You may download a PDF of this document from https://www.api.org/oil-and-natural-gas/wells-to-consumer/exploration-and-production/hydraulic-fracturing/65-2-isolating-potential-flow-zones

RP 65-3
Wellbore Plugging and Abandonment

Provides guidance for the design, placement, and verification of cement plugs in wells to be temporarily or permanently abandoned, as well as remediation and verification of annular barriers. Wells temporarily abandoned (suspended) are intended to be re-entered in the future. The placement of barriers may depend on whether the well is to be temporarily or permanently abandoned. Cement plug lengths are not considered in this document. Pages: 52

1st Edition | June 2021 | Product Number: G65301 | Price: $128.00

FIELD OPERATING 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

4th Edition | June 2000 | Reaffirmed: February 2020
Product Number: G11AR4 | Price: $154.00

Spec 11AX ◆
Specification for Subsurface Sucker Rod Pump Assemblies, Components, and Fittings
(includes Addendum 1 dated May 2019 and Errata 1 dated May 2023)

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

13th Edition | May 2015 | Effective Date: November 4, 2015
Product Number: G11AX13 | Price: $217.00

Spec 11AX *
Specification for Subsurface Sucker Rod Pump Assemblies, Components, and Fittings—Russian
(includes Addendum 1 dated May 2019 and Errata 1 dated May 2023)

Russian translation of Spec 11AX.

13th Edition | May 2015 | Product Number: G11AX13R | Price: $217.00

Spec 11B ◆
Sucker Rods and Rod-Related Products

Provides the requirements and guidelines for the design of thread form requirements, steel sucker rods and pony rods, fiber reinforced plastic (FRP) sucker rods and pony rods, sinker bars, polished rods, couplings and sub-couplings, thread gauges, pumping tees, stuffing boxes, polished rod clamps, calibration of measuring equipment, standard methods of mechanical properties testing, and polished rod liners as defined for use in the sucker rod lift method for the petroleum and natural gas industry. Pages: 188

28th Edition | December 2023 | Effective Date: December 12, 2024
Product Number: G11B28 | Price: $197.00

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

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

9th Edition | August 2008 | Reaffirmed: July 2020
Product Number: G11BR09 | Price: $130.00

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

Chinese translation of RP 11BR.

9th Edition | August 2008 | Reaffirmed: July 2020
Product Number: G11BR09C | Price: $130.00

Spec 11E ◆
Pumping Units

Provides the requirements and guidelines for the design and rating of beam pumping units for use in the petroleum and natural gas industry. Included are all components between the carrier bar and the gear reducer input shaft. This includes the following: beam pump structures; pumping unit gear reducer. Only loads imposed on the structure and/or gear reducer by the polished rod load are considered in this specification. Also included are the requirements for the design and rating of enclosed gear reducers wherein the involute gear tooth designs include helical and herringbone gearing. The rating methods and influences identified in this specification are limited to single- and multiple-stage designs applied to beam pumping units in which the pitch-line velocity of any stage does not exceed 5000 ft/min and the speed of any shaft does not exceed 3600 rpm. Pages: 109

20th Edition | October 2022 | Effective Date: April 1, 2023
Product Number: G11E20 | Price: $231.00

RP 11ER
Guarding of Pumping Units

Provides a reference or guide for the design, manufacture, and installation of guards for moving parts on pumping units. It is based on knowledge and experience gained through the application of guards for pumping units by the production segment of the petroleum industry. Pages: 27

4th Edition | July 2022 | Product Number: G11ER04 | Price: $110.00

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

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

5th Edition | November 2013 | Reaffirmed: July 2019
Product Number: G11G05 | Price: $107.00

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

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

5th Edition | June 2008 | Product Number: G11L05 | Price: $131.00

Bull 11L2
Bulletin on Catalog of Analog Computer Dynamometer Cards

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

1st Edition | December 1969 | Reaffirmed: September 1999
Product Number: G05700 | Price: $152.00

Bull 11L3
Sucker Rod Pumping System Design Book
(includes Errata 1 dated November 1973 and Supplement 1 dated February 1977)

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

1st Edition | May 1970 | Product Number: G05800 | Price: $164.00

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

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

2nd Edition | May 2008 | Product Number: G11L602 | Price: $108.00

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

Chinese translation of TR 11L6.

2nd Edition | May 2008 | Product Number: G11L602C | Price: $108.00

Spec 11PL
Plunger Lift Lubricators and Related Equipment

Provides requirements and guidelines for plunger lift lubricators, which includes plunger catchers as defined herein for use in the petroleum and natural gas industry. Threaded and flanged external connections are covered by the applicable API or proprietary connection design requirements. This specification provides requirements for the functional specification and technical specification, including design requirements (outlet locations, specified and optional), design extensions, design verification and validation, welding, materials, quality controls, marking, documentation and data control, shipment, and storage. Pages: 72

1st Edition | June 2019 | Effective Date: June 2020
Product Number: G11PL01 | Price: $147.00

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RP 11S1
Electrical Submersible Pump Dismantle, Inspection and Failure Analysis

Covers the processes and procedures of collecting required information to complete a root cause failure analysis of an electrical submersible pump (ESP) system. These include: procedures for disassembly, inspection, final report, failure classification, and corrective actions. Items covered by this recommended practice include pumps, intakes, gas separators, gas handling devices, seals/protectors, motors (induction and permanent magnet motors), gauges, sensors, motor lead extensions, potheads, and power cables. Tooling and test equipment may differ between suppliers; however, the typical assembly and inspection procedures and principles are generally applicable for most ESP systems. Pages: 60

4th Edition | April 2022 | Product Number: G11S14 | Price: $152.00

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

1st Edition | December 1995 | Reaffirmed: October 2013
Product Number: G11S61 | Price: $150.00

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: $160.00

RP 11S9
Permanent Magnet Motor Safety

Serves to emphasize safety aspects and recommended practices concerning the handling, installation, troubleshooting, operation, and pulling of permanent magnet motors (PMMs) used in subsurface and surface artificial lift pumping systems. Pages: 115

1st Edition | March 2023 | Product Number: G11S901 | Price: $153.00

LEASE PRODUCTION VESSELS

Spec 12B ◆
Specification for Bolted Tanks for Storage of Production Liquids
(includes Errata 1 dated November 2024)

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 with internal pressures approximating atmospheric pressure. 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. Pages: 30

17th Edition | December 2020
Product Number: G12B17 | Price: $164.00

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

Covers material, design, fabrication, and testing requirements for vertical, cylindrical, aboveground, closed top, welded steel storage tanks with internal pressures approximately atmospheric at various sizes and capacities ranging from 500 to 10,000 barrels. This specification is designed to provide the oil production industry with tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. This specification is for the convenience of purchasers and manufacturers in ordering and fabricating tanks. Pages: 29

12th Edition | June 2017 | Effective Date: December 1, 2017
Product Number: G12D12 | Price: $132.00

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

Covers new shop-fabricated vertical, cylindrical, aboveground, welded steel storage tanks in the standard sizes and capacities. It defines the material, design, fabrication, and testing requirements, as well as identifying the acceptable internal pressures given in Table 1. This specification is designed to provide the oil production industry with tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. This specification is for the convenience of purchasers and manufacturers in ordering and fabricating tanks. Pages: 37

14th Edition | October 2024 | Effective Date: April 30, 2025
Product Number: G12F14 | Price: $186.00

RP 12J ◆■
Process Design of Oil and Gas Separators and Scrubbers

Provides requirements and recommendations for the process design of pressure-vessel-based gas–liquid and gas–liquid–liquid separators operating on static facilities and facilities subject to motion such as floating production, storage, and offloading (FPSO) and tension leg platforms. Separators covered by this document may be vertical (e.g. scrubbers, knockout drums) or horizontal (e.g. free water knockout) and are limited to those containing conventional, longstanding, separation internals such as inlet devices, mist eliminators, agglomerators, and distribution baffles. Other internals such as solids jetting systems are addressed by company requirements and/or technology supplier designs. Pages: 100

9th Edition | September 2024 | Product Number: G12J09 | Price: $141.00

To purchase individual API standards, visit apiwebstore.org

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

2nd Edition | November 1994 | Reaffirmed: April 2008
Product Number: G12N02 | Price: $103.00

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. Pages: 30

5th Edition | May 2022 | Effective Date: November 1, 2022
Product Number: G12P05| Price: $148.00

Std 12R1
Installation, Operation, Maintenance, Inspection, and Repair of Tanks in Production Service
(includes Addendum 1 dated June 2021)

For use as a guide for new tank installations and maintenance of existing tanks, Std 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: 53

6th Edition | March 2020 | Product Number: G12R16 | Price: $190.00

DRILLING, COMPLETION, AND FRACTURING FLUIDS

Spec 13A ◆
Drilling Fluids Materials
(includes Addendum 1 dated April 2020, Addendum 2 dated June 2022, and Errata 1 dated February 2024)

Covers physical properties and test procedures for materials manufactured for use in oil- and gas-well drilling fluids. The materials covered are barite; hematite; bentonite; non-treated bentonite; attapulgite; sepiolite; technical grade, low-viscosity carboxymethyl cellulose (CMC-LVT); technical grade, high-viscosity carboxymethyl cellulose (CMC-HVT); starch; low-viscosity polyanionic cellulose (PAC-LV); high-viscosity polyanionic cellulose (PAC-HV); and drilling-grade xanthan gum. This specification is intended for the use of manufacturers, distributors, and end users of named products. Annex A (informative) contains information on the API Monogram Program and requirements for the approved use of the API Monogram by licensees. Pages: 120

19th Edition | October 2019 | Effective Date: April 2020
Product Number: G13A19 | Price: $247.00

RP 13B-1
Recommended Practice for Field Testing Water-Based Drilling Fluids
(includes Errata 1 dated May 2020, Errata 2 dated December 2021, and Errata 3 dated January 2023)

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;
- low-gravity solids and weighting material concentrations.

Annexes A through K provide additional test methods that may be used for:

- chemical analysis for calcium, magnesium, calcium sulfate, sulfide, carbonate, and potassium;
- determination of shear strength;
- determination of resistivity;
- removal of air;
- drill-pipe corrosion monitoring;
- sampling, inspection, and rejection;
- rig-site sampling;
- calibration and verification of glassware, thermometers, timers, viscometers, retort cup, and drilling fluid balances;
- permeability plugging testing at high temperature and high pressure for two types of equipment;
- sag testing. Pages: 132

5th Edition | May 2019 | Product Number: GX13B15 | Price: $229.00

RP 13B-1 *■
Recommended Practice for Field Testing Water-Based Drilling Fluids—Ukrainian
(includes Errata 1 dated May 2020, Errata 2 dated December 2021, and Errata 3 dated January 2023)

Ukrainian translation of RP 13B-1.

5th Edition | May 2019 | Product Number: GX13B15U | Price: $229.00

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RP 13B-2
Field Testing Nonaqueous-Based Drilling Fluids

Provides standard procedures for determining the following characteristics of nonaqueous drilling fluids (NADFs): drilling fluid density (mud weight); viscosity and gel strength; filtration; nonaqueous fluid (NAF), water, and solids concentrations; alkalinity, chloride concentration, and calcium concentration; electrical stability (ES); lime and calcium concentrations, calcium chloride, and sodium chloride concentrations; low-gravity solids and weighting material concentrations; sand content; high-temperature, high-pressure (HTHP) filtration using the permeability plugging apparatus (PPA). Pages: 164

6th Edition | July 2023 | Product Number: G13B206 | Price: $247.00

RP 13C
Drilling Fluid Processing Systems Evaluation

Specifies procedures for assessing and modifying the performance of solids control equipment systems commonly used in the field in petroleum and natural gas drilling-fluids processing. Pages: 116

6th Edition | December 2023 | Product Number: G13C06 | Price: $210.00

RP 13D
Rheology and Hydraulics of Oil-Well Drilling Fluids

Provides a basic understanding of and guidance about drilling fluid rheology and hydraulics, and their application to drilling operations. For this recommended practice, rheology is the study of flow characteristics of a drilling fluid and how these characteristics affect movement of the fluid. Specific measurements are made on a fluid to determine rheological parameters under a variety of conditions. From this information the circulating system can be designed or evaluated regarding how it will accomplish certain desired objectives. Pages: 98

7th Edition | September 2017 | Reaffirmed: May 2023
Product Number: G13D07 | Price: $192.00

RP 13I
Laboratory Testing of Drilling Fluids
(includes Addendum 1 dated January 2023)

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. Pages: 93

9th Edition | December 2020 | Product Number: GX13I9 | Price: $330.00

RP 13J
Testing of Heavy Brines
(includes Errata 1 dated April 2024)

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. This standard 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 at which the brines make the transition between liquid and solid at atmospheric pressure (a discussion of crystallization temperature under pressure is provided in Annex C), the pH, iron contamination, and buffering capacity. Pages: 91

6th Edition | January 2023 | Product Number: G13J06 | Price: $167.00

RP 13K
Chemical Analysis of Barite

Provides 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: 79

4th Edition | April 2022 | Product Number: G13K04 | Price: $149.00

RP 13L ■
Training and Qualification of Drilling and Completion Fluids Specialists

Includes two parts, as follows. The first part is a summary of basic training and knowledge that an employee or contractor shall possess to be identified as a Drilling and Completion Fluids Specialist. The first part covers basic skills as would be taught at an entry-level drilling fluids training program. The second part covers a set of advanced skills that will be required to support complex wells at the rig site. Levels of understanding for both core and advanced skills have been generally outlined but not totally defined. Pages: 60

3rd Edition | October 2024 | Product Number: G13L03 | Price: $128.00

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: July 2023
2-Year Extension: June 2015 | Product Number: GX13M01
Price: $122.00

RP 13M/ISO 13503-1:2003 *
Recommended Practice for the Measurement of Viscous Properties of Completion Fluids—Russian
(RP 13M replaces RP 39)

Russian translation of RP 13M/ISO 13503-1:2003.

1st Edition | July 2004 | Reaffirmed: July 2023
Product Number: GX13M01R | Price: $122.00

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

1st Edition | December 2006 | Reaffirmed: July 2015
Product Number: GG13M41 | Price: $71.00

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TR 13M-5
Procedure for Testing and Evaluating the Performance of Friction (Drag) Reducers in Aqueous-Based Fluid Flowing in Straight, Smooth Circular Conduits

Provides a consistent methodology to test and evaluate the performance of friction (drag) reducers in straight, smooth circular conduits. This standard includes only smooth-walled tubing and excludes any rough-walled tubing. Pages: 22

1st Edition | October 2018 | Product Number: G13M501 | Price: $107.00

RP 13M-6/ISO 13503-6:2012
Procedure for Measuring Leakoff of Completion Fluids Under Dynamic Conditions

Provides consistent methodology for measuring the fluid loss of completion fluids under dynamic conditions. This standard is applicable to all completion fluids except those that react with porous media.

This edition of RP 13M-6 is the modified national adoption of ISO 13503-6:2012. Pages: 23

1st Edition | May 2020 | Product Number: G13M601 | Price: $132.00

TR 13TR1
Stress Corrosion Cracking of Corrosion Resistant Alloys in Halide Brines Exposed to Acidic Production Gas
(includes Addendum 1 dated July 2022)

Evaluates the stress corrosion cracking (SCC) risks of a range of corrosion resistant alloys (CRAs) in various halide brine compositions for the case of exposure to acidic production gas (CO_2+H_2S). Also evaluated are SCC risks due to air exposure. However, the testing became focused on a group of martensitic stainless steels alloyed with Ni and Mo, which are collectively referred to as modified 13Cr martensitic stainless steel (SS) or alternatively in some publications as super (S13Cr) martensitic SSs. Most tests evaluated the as-received brine, excluding proprietary additives such as corrosion inhibitor or oxygen scavengers. For completeness and comparison, test results provided by member companies in the API program or in the publications are cited; these test protocols may be different from those in the API test protocols hence, where that occurs, significant differences are noted. Pages: 39

1st Edition | November 2017 | Product Number: G13TR11 | Price: $154.00

TR 13TR3
Size Measurement of Dry, Granular Drilling Fluid Particulates

Serves as a guide for selection of appropriate techniques to determine the particle size distribution (PSD) of relatively large, dry solid additives for drilling fluids, especially lost circulation materials (LCMs). Detailed procedures for the utilization of any specific PSD method are not included. The technician should refer to and be guided by the measurement equipment manufacturer's instructions.

The particulates range in size from approximately one micron to as much as several millimeters in diameter and are considered “granular” in shape, i.e. relatively isometric (of similar length, width, and height).

The recommendations in this technical report generally are not applicable to the measurement of the PSD of non-isometric (high aspect ratio) materials, such as fibers or flakes. Pages: 32

1st Edition | October 2018 | Product Number: G13TR31 | Price: $122.00

OFFSHORE SAFETY AND ANTIPOLLUTION

Std 2CCU
Offshore Cargo Carrying Units

Defines the design, material, manufacture, inspection, repair, maintenance, and marking requirements for offshore cargo carrying units (CCU) and lifting sets to include dry goods boxes, baskets, and other skids designed to move equipment and goods offshore with maximum gross weight up to 70,000 kg (154,323 lb). Pages: 57

1st Edition | August 2017 | Reaffirmed: September 2024
Product Number: G2CCU01 | Price: $130.00

RP 14B
Design, Installation, Operation, Test, and Redress of Subsurface Safety Valve Systems
(includes Errata 1 dated September 2024)

Establishes requirements and provides guidelines for subsurface safety valve (SSSV) system equipment. This includes requirements for SSSV system design, installation, operation, testing, redress, support activities, documentation, and failure reporting. SSSV system equipment addressed by this document includes control systems, control lines, SSSVs, and secondary tools as defined herein. SSSV types including surface controlled (SCSSV), sub-surface controlled (SSCSV), and sub-surface injection safety valves (SSISV) are included. Requirements for testing of SSSVs including frequency and acceptance criteria are included. Alternate technology SSSV equipment and systems are included in these requirements.

This document is not applicable to design, qualification, or repair activities for SSSVs. This document does not specify when a SSSV is required. Pages: 37

NOTE Spec 14A provides requirements for SSSV equipment design, qualification, and repair.

6th Edition | September 2015 | Product Number: G14B06 | Price: $157.00

RP 14C
Analysis, Design, Installation, and Testing of Safety Systems for Offshore Production Facilities
(includes Errata 1 dated May 2018)

Illustrates how system analysis methods can be used to determine safety requirements to protect common process components. This document also includes:

- a method to document and verify process safety system functions (i.e. SAFE chart);
- design guidance for ancillary systems such as pneumatic supply systems and liquid containment systems;
- a uniform method of identifying and symbolizing safety devices;
- procedures for testing common safety devices with recommendations for test data and acceptable test tolerances. Pages: 132

8th Edition | February 2017 | Product Number: G14C08 | Price: $285.00

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

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

5th Edition | October 1991 | Reaffirmed: September 2019
Product Number: G07185 | Price: $184.00

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

Chinese translation of RP 14E.

5th Edition | October 1991 | Reaffirmed: September 2019
Product Number: 811-07185 CN940 | Price: $184.00

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

Recommends minimum requirements and guidelines for the design, installation, and maintenance of electrical systems on fixed and floating petroleum facilities located offshore. For facilities classified as Zone 0, Zone 1, or Zone 2, reference RP 14FZ. These facilities include drilling, producing, and pipeline transportation facilities associated with oil and gas exploration and production.

This RP is not applicable to Mobile Offshore Drilling Units (MODUs) without production facilities. This document is intended to bring together in one place a brief description of basic desirable electrical practices for offshore electrical systems. The recommended practices contained herein recognize that special electrical considerations exist for offshore petroleum facilities. Pages: 189

6th Edition | October 2018 | Product Number: G14F06 | Price: $202.00

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

Recommends minimum requirements and guidelines for the design, installation, and maintenance of electrical systems on fixed and floating petroleum facilities located offshore. For facilities classified as 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 | Reaffirmed: April 2020
Product Number: G14FZ02 | Price: $347.00

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

4th Edition | April 2007 | Reaffirmed: September 2019
Product Number: G14G04 | Price: $154.00

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

2nd Edition | May 2001 | Reaffirmed: September 2019
Product Number: G14J02 | Price: $147.00

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: $77.00

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FIBERGLASS AND PLASTIC PIPE

Spec 15HR ◆
High-Pressure Fiberglass Line Pipe
(includes Errata 1 dated August 2016 and Errata 2 dated January 2021)

Formulated to provide for 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 couplings, fittings, flanges, reducers, and adapters. Pages: 42

4th Edition | February 2016 | Effective Date: August 1, 2016
Reaffirmed: April 2021 | Product Number: G15HR4 | Price: $137.00

Spec 15HR *
High-Pressure Fiberglass Line Pipe—Russian
(includes Errata 1 dated August 2016 and Errata 2 dated January 2021)

Russian translation of Spec 15HR.

4th Edition | February 2016 | Reaffirmed: April 2021
Product Number: G15HR4R | Price: $137.00

Spec 15LE ◆
Specification for Polyethylene Line Pipe (PE)

Covers polyethylene line pipe (PE) utilized for the production and transportation of oil, gas, mixed-phase fluids, and non-potable water. The piping is intended for use in new construction, insertion renewal, line extension, and repair of both aboveground and buried pipe applications. Pages: 35

5th Edition | September 2022 | Effective Date: March 1, 2023
Product Number: G15LE05 | Price: $126.00

Spec 15LF
Layflat Hose Assemblies for the Transport of Water in Oilfield Applications

Provides requirements for the manufacture and qualification of layflat hose assemblies in onshore oilfield water transfer applications. Also included are performance requirements for materials, hose, and couplings. These products consist of single or multiple layers of woven polymeric fibers lined with a polymeric material that is suitable for onshore oilfield water transfer service. The layflat hose assemblies addressed under this specification are capable of being spooled for storage, transport. and installation by both the original equipment manufacturer and the operator. Pages: 35

1st Edition | May 2021 | Product Number: G15LF1 | Price: $112.00

Spec 15LR ◆
Specification for Low Pressure Fiberglass Line Pipe
(includes Errata 1 dated June 2018 and Errata 2 dated April 2021)

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

7th Edition | August 2001 | Effective Date: February 1, 2002
Reaffirmed: October 2018 | Product Number: G15LR7 | Price: $120.00

Spec 15LR *
Specification for Low Pressure Fiberglass Line Pipe—Chinese
(includes Errata 1 dated June 2018 and Errata 2 dated April 2021)

Chinese translation of Spec 15LR.

7th Edition | August 2001 | Reaffirmed: October 2018
Product Number: G15LR7C | Price: $120.00

Spec 15PX
Specification for Crosslinked Polyethylene (PEX) Line Pipe

Covers PEX line pipe used for the production and transportation of oil, gas, and nonpotable water. This specification does not cover pipe for chlorinated water service. The piping is intended for use in new construction, structural pressure-rated liner, line extension, and repair of both aboveground and buried-pipe applications. Equipment covered by this specification is listed as follows: PEX line pipe; fittings; and metallic flange couplers for field installations and PEX face flanges used as internal diameter adapters. Pages: 39

2nd Edition | February 2022 | Product Number: G15PX2 | Price: $124.00

Spec 15S ◆
Spoolable Reinforced Plastic Line Pipe
(includes Addendum 1 dated August 2023)

Provides requirements for the manufacture and qualification of spoolable reinforced plastic line pipe in oilfield and energy applications, including transport of multiphase fluids, hydrocarbon gases, hydrocarbon liquids, oilfield production chemicals, and nonpotable water. Also included are performance requirements for materials, pipe, and fittings. Pages: 56

3rd Edition | April 2022 | Effective Date: October 2022
Product Number: G15S03 | Price: $164.00

RP 15SA
Integrity Management of Spoolable Reinforced Line Pipe

For integrity management of an existing API 15S asset including threat identification, identification of potential failure modes, risk assessment, testing requirements, initial and ongoing inspection practices, end-fitting and coupling inspection, potential mitigations, repair, and associated documentation. Pages: 28

1st Edition | February 2022 | Product Number: G15SA01 | Price: $85.00

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RP 15SIH
Installation and Handling of Spoolable Reinforced Line Pipe

Establishes recommended practices for onshore installation and handling of spoolable reinforced plastic line pipe (API Spec 15S products) to prevent damage to pipe and field-fittings (couplings, connectors, and end-fittings) in the field environment and to assure assembly integrity prior to use. This document covers handling, layout planning, and installation by direct bury (trench and backfill), surface lay, directional drilling, plowing, and pull-through methods. Post-installation inspection and field testing are also covered. This recommended practice outlines and identifies the important items that should be considered by each manufacturer and installer in their detailed procedures. This document is not intended to serve as a procedure or checklist for the installation and handling of spoolable reinforced line pipe products nor is it inclusive of all items that may be required for the installation and handling of these products. Pages: 23

1st Edition | October 2021 | Product Number: G15SIH1 | Price: $85.00

RP 15TL4
Recommended Practice for Care and Use of Fiberglass Tubulars

Provides information on packing, transporting, handling, storing, inspecting, and installing fiberglass tubulars in oilfield usage. Trouble-free service and maximum safety should result if this recommended practice is followed. Fiberglass tubulars differ in properties from metallic tubular goods, and different installation techniques are required. Pages: 34

3rd Edition | October 2022 | Product Number: G15TL403 | Price: $120.00

RP 15WT
Operations for Layflat Hose in Oilfield Water Applications

Provides guidelines and establishes recommended practices for the operation of layflat hose used for the transportation of water associated with onshore upstream oil and gas operations, to prevent damage of layflat hose and damage of layflat hose assemblies.

This document covers the transportation of formation water, injection water, brackish water, fresh water, and saline. The scope of this document excludes the initial and final connections of the layflat hose to the source and receiving points. Pages: 36

1st Edition | December 2019 | Reaffirmed: November 2024
Product Number: G15WT1 | Price: $127.00

DRILLING WELL CONTROL EQUIPMENT AND SYSTEMS

Spec 16A ◆
Specification for Drill-Through Equipment
(includes Errata 1 dated August 2017, Addendum 1 dated October 2017, Errata 2 dated November 2017, and Errata 3 dated April 2018)

Defines the requirements for performance, design, materials, testing and inspection, welding, marking, handling, storing, and shipping of drill-through equipment used for drilling for oil and gas.

Specifically, this document applies to the manufacture and testing of ram blowout preventers; ram blocks, packers, and top seals; annular blowout preventers; annular packing units; and associated connectors.

It also defines service conditions in terms of pressure, temperature, and wellbore fluids for which the equipment is designed.

Repair and remanufacture of 16A equipment is now covered in Std 16AR. This specification does not apply to field use or field. Pages: 122

4th Edition | April 2017 | Product Number: G16A04 | Price: $204.00

Std 16AR
Standard for Repair and Remanufacture of Drill-Through Equipment
(includes Errata 1 dated August 2017)

Specifies requirements for repair and remanufacture of drill-through equipment built under API 16A. This standard also applies to repair and remanufacture of drill-through equipment manufactured to API 6A requirements and produced prior to the existence of API 16A.

This standard also covers the testing, inspection, welding, marking, certification, handling, storing, and shipping of equipment repaired or remanufactured per this standard. Pages: 104

1st Edition | April 2017 | Product Number: G16AR01 | Price: $201.00

Spec 16C ◆
Choke and Kill Equipment
(includes Addendum 1 dated July 2024)

Identifies requirements for the performance, design, materials, testing, inspection, welding, marking, handling, storing, shipment, and purchasing of surface and subsea choke and kill equipment for use in the petroleum and natural gas industries. These requirements provide for safe and functionally interchangeable surface and subsea choke and kill system equipment. This specification does not apply to field use or field testing. This specification also does not apply to repair of choke and kill equipment, except for weld repair in conjunction with manufacturing. Pages: 121

3rd Edition | March 2021 | Product Number: G16C03 | Price: $214.00

Spec 16D ◆
Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment
(includes Addendum 1 dated July 2023)

Establishes design standards for systems used to control blowout preventers (BOPs) and associated valves that control well pressure during drilling operations. The design standards applicable to subsystems and components do not include material selection and manufacturing process details but may serve as an aid to the purchaser. Although diverters are not considered well control devices, their controls are often incorporated as part of the BOP control system and therefore are included in this specification. The requirements provided in this specification apply to the following control system categories: control systems for surface mounted BOP stacks; control systems for subsea BOP stacks (common elements); discrete hydraulic control systems for subsea BOP stacks; electro-hydraulic/multiplex control systems for subsea BOP stacks; control systems for diverter equipment; auxiliary equipment control systems and interfaces; emergency disconnect sequenced systems; backup systems; special deepwater/harsh environment features. Pages: 144

3rd Edition | November 2018 | Effective Date: May 1, 2019
Product Number: G16D03 | Price: $243.00

Spec 16F ◆
Specification for Marine Drilling Riser Equipment
(includes Errata 1 dated February 2019 and Addendum 1 dated January 2021)

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 applies to all riser system components that are in the primary load path during operation, running, and retrieval, including but not limited to riser couplings, riser main tube, riser adapters, riser external lines when used for load sharing, riser tensioner rings, telescopic joints, flex/ball joints, and special riser joints. Pages: 120

2nd Edition | November 2017 | Product Number: G16F02 | Price: $173.00

To purchase individual API standards, visit apiwebstore.org

Spec 16F *
Specification for Marine Drilling Riser Equipment—Russian
(includes Errata 1 dated February 2019, Addendum 1 dated January 2021, and Addendum 2 dated December 2022)

Russian translation of Spec 16F.

2nd Edition | November 2017 | Product Number: G16F02R | Price: $173.00

TR 16G
Well Control Equipment Reliability Modeling

Documents methods of reliability analysis for well control equipment systems installed for drilling wells. Well control equipment systems are designed with components that provide wellbore pressure control in support of well operations. As an example, the following typical systems were modeled and analyzed: surface on-shore BOP systems; surface offshore BOP systems; subsea BOP systems with discrete hydraulic control system; offshore DP MODU with a subsea BOP system with electro-hydraulic/multiplex control system. Pages: 39

1st Edition | March 2023 | Product Number: G16G01 | Price: $96.00

Bull 16H
Automated Safety Instrumented Systems for Onshore Blowout Preventer Actuation

Provides a review of the equipment and interfaces to be considered for the automation of a blowout preventer to place the well in a safe state in an onshore environment. It also provides an overview of components that can be considered for future research into developing an automated well control actuation system. These technologies, once fully developed and implemented, can help automate and expand ways to mitigate unexpected events resulting in a loss of primary well control. Pages: 26

1st Edition | February 2022 | Product Number: G16H01 | Price: $85.00

RP 16Q
Design, Selection, Operation and Maintenance of Marine Drilling Riser Systems
(includes Addendum 1 dated March 2023 and Addendum 2 dated March 2024)

Pertains to the design, selection, operation, and maintenance of marine riser systems for floating drilling operations. Its purpose is to serve as a reference for designers, for those who select system components, and for those who use and maintain this equipment. For the purposes of this standard, a marine drilling riser system includes the tensioner system and all equipment between the top connection of the upper flex/ball joint and the bottom connection of the lower flex/ball joint. It specifically excludes the diverter, LMRP, BOP stack, and hydraulic connectors. Pages: 90

2nd Edition | April 2017 | Product Number: G16Q02 | Price: $151.00

RP 16Q *
Design, Selection, Operation and Maintenance of Marine Drilling Riser Systems—Russian
(includes Addendum 1 dated March 2023 and Addendum 2 dated March 2024)

Russian translation of RP 16Q.

2nd Edition | April 2017 | Product Number: G16Q02R | Price: $151.00

Spec 16RCD ◆
Specification for Rotating Control Devices
(includes Addendum 1 dated October 2022 and Addendum 2 dated November 2023)

Provides for the availability of safe and functionally interchangeable rotating control devices (RCDs) utilized in air drilling, drilling operations for oil and gas, and in geothermal drilling operations. Technical content provides requirements for design, performance, materials, tests and inspection, welding, marking, handling, storing, and shipping. This specification does not apply to field use or field testing of RCDs. Critical components are those parts having requirements specified in this document. Pages: 57

3rd Edition | June 2022 | Effective Date: December 1, 2022
Product Number: G16RCD03 | Price: $193.00

RP 16ST
Coiled Tubing Well Control Equipment Systems
(includes Addendum 1 dated February 2022)

Addresses coiled tubing well control equipment assembly and operation as it relates to well control practices. This document covers well control equipment assembly and operations used in coiled tubing intervention and coiled tubing drilling/milling applications performed through: tree equipment constructed in accordance with API 6A or API 11IW or both; a surface flow head or surface test tree constructed in accordance with API 6A; a fracture stimulation wellhead assembly (with at least two gate valves installed for isolation); drill pipe or workstrings with connections manufactured in accordance with API 5CT, API 5DP or API 7-1, or a combination thereof. Pages: 131

2nd Edition | February 2021 | Product Number: G16ST02 | Price: $214.00

TR 16TR1
BOP Shear Ram Performance Test Protocol
(includes Errata 1 dated October 2018)

Outlines the standardized test protocol, including data and reporting requirements, for performing sealing and non-sealing blowout preventer (BOP) shear ram performance tests. This protocol determines the parameters that can support field system performance and confidence in successful shearing and sealing.

This document is not intended to be used for qualifying BOP shear rams or as a factory acceptance test procedure. Qualification and factory acceptance testing of BOP shear rams is per API 16A. Pages: 30

1st Edition | July 2018| Product Number: G16TR11 | Price: $120.00

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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.

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Std 53
Well Control Equipment Systems for Drilling Wells

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. Pages: 86

5th Edition | December 2018 | Product Number: G05305 | Price: $195.00

RP 59
Recommended Practice for Well Control Operations

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

2nd Edition | May 2006 | Reaffirmed: December 2018
Product Number: G59002 | Price: $152.00

RP 59 *
Recommended Practice for Well Control Operations—Kazakh

Kazakh translation of RP 59.

2nd Edition | May 2006 | Reaffirmed: December 2018
Product Number: G59002K | Price: $152.00

RP 59 *
Recommended Practice for Well Control Operations—Russian

Russian translation of RP 59.

2nd Edition | May 2006 | Reaffirmed: December 2018
Product Number: G59002R | Price: $152.00

Std 64
Diverter Equipment Systems
(includes Errata 1 dated March 2018 and Addendum 1 dated December 2018)

Provides information on the design, manufacture, quality control, installation, maintenance, and testing of the diverter system, and associated components. The diverter system provides a flow control system to direct controlled or uncontrolled wellbore fluids away from the immediate drilling area for the safety of personnel and equipment. Pages: 69

3rd Edition | August 2017 | Product Number: G64003 | Price: $170.00

SUBSEA PRODUCTION SYSTEMS

RP 17A
Design and Operation of Subsea Production Systems—General Requirements and Recommendations

Provides general requirements and recommendations for the development and operation of subsea production/injection systems, from the concept development phase to decommissioning and abandonment. This document references other API 17-series documents, as well as various relevant industry documents. A complete subsea production/ injection system comprises several subsystems necessary to produce hydrocarbons from one or more subsea wells and transfer them to a processing/host facility located offshore (fixed, floating, or subsea) or onshore, or to inject water/gas via subsea facilities and/or wells. Pages: 55

6th Edition | April 2002 | Product Number: G17A06 | Price: $124.00

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. API 17B supplements API 17J and API 17K, which specify minimum requirements for the design, material selection, manufacture, testing, marking, and packaging of unbonded and bonded flexible pipes, respectively. API 17B 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, API 17B applies to flexible pipe systems, and provides input to API 17L1 and API 17L2 coverage of ancillary equipment. Pages: 286

6th Edition | May 2024 | Product Number: G17B06 | Price: $265.00

Spec 17D ◆
Specification for Subsea Wellhead and Tree Equipment
(includes Addendum 1 dated December 2022)

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 (FAT)], marking, storing, and shipping for individual equipment, subassemblies, and subsea tree assemblies. Pages: 256

3rd Edition | October 2021 | Effective Date: October 2022
Product Number: G17D03 | Price: $255.00

Spec 17E
Specification for Subsea Umbilicals
(includes Addendum 1 dated December 2017)

Specifies requirements and gives recommendations for the design, material selection, manufacture, design verification, testing, installation, and operation of subsea control systems, chemical injection, gas lift, utility and service umbilicals, and associated ancillary equipment for the petroleum and natural gas industries. This also applies to umbilicals containing electrical conductors, optical fibers, thermoplastic hoses, and metallic tubes, either alone or in combination, and applies to umbilicals that are for static or dynamic service, and with routings of surface-surface, surface-subsea, and subsea-subsea. Pages: 178

5th Edition | July 2017 | Product Number: G17E05 | Price: $241.00

Spec 17E *
Specification for Subsea Umbilicals—Russian
(includes Addendum 1 dated December 2017)

Russian translation of Spec 17E.

5th Edition | July 2017 | Product Number: G17E05R | Price: $241.00

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Std 17F
Standard for Subsea Production and Processing Control Systems

Applies to the design, fabrication, testing, installation, and operation of subsea production and processing control systems (SPCS). This standard covers surface control system equipment, subsea-installed control system equipment, and control fluids. This equipment is used for control of subsea production and process of oil and gas and for subsea water and gas injection services. Where applicable, this standard can be used for secondary users. Pages: 288

5th Edition | April 2023 | Product Number: G17F05 | Price: $292.00

Std 17G
Design and Manufacture of Subsea Well Intervention Equipment

Defines a minimum set of requirements for performance, design, materials, testing and inspection, hot forming, welding, marking, handling, storing, and shipping of new build subsea well intervention equipment [through-BOP intervention riser system (TBIRS) and openwater intervention riser system (OWIRS)].

The requirements in this standard apply to equipment whose rated working pressure (RWP) is less than or equal to 103.4 MPa (15,000 psi) or whose rated temperature is less than or equal to 177 °C (350 °F). For equipment ratings that exceed these limits, see API 17TR8.

Structural design methods and criteria given in API 17G are limited to components manufactured from materials that ensure ductile failure modes (e.g., carbon steels, low-alloy steels, and corrosion-resistant alloys). Components manufactured from materials that may not ensure ductile failure modes (e.g., composite materials, titanium, and titanium alloys) are outside the scope of this standard.

The standard covers equipment that is connected to a fluid conduit tieback riser, either inside the marine riser (TBIRS) or open water (OWIRS). Intervention equipment, such as riserless light well intervention systems, downline connected equipment, and remotely operated vehicle (ROV) intervention equipment, are outside the scope of this standard. Pages: 280

3rd Edition | November 2019 | Product Number: G17G03 | Price: $226.00

RP 17G1
Configuration and Operation for Subsea Well Intervention Systems

Provides guidance for the selection of a subsea well intervention system, defines minimum requirements of a subsea well intervention system for specific operation(s) and environments to ensure the selected system is fit or purpose. This RP applies to new and existing subsea well intervention systems irrespective of whether the equipment complies with the latest requirements of API 17G. All subsea well intervention systems are covered by this RP and the equipment typically included in (but not limited to) the system is described in the suite of API 17G intervention documents. Pages: 82

1st Edition | July 2022 | Product Number: G17G101 | Price: $157.00

RP 17G2
Recommended Practice for Subsea Pumping Well Intervention Systems

Provides recommendations for the design, manufacture, testing, and performance of SPWISs deployed from a mobile offshore work unit such as a multipurpose vessel. This document contains the system-level requirements and recommendations and where not found elsewhere, the information that applies to individual components. To the greatest extent possible, this document points the reader to the API document that is applicable to each system component or subsystem. This information is applicable to all new and existing SPWISs. SPWISs are intended to satisfy the requirements of API 17G and API 17G5, with modifications thereof as given in this document. Therefore, this document is not intended to be a standalone document. It is to be used in conjunction with API 17G (parent document), API 17G1, API 17G5, and end user requirements. Pages: 56

1st Edition | October 2023 | Product Number: G17G201 | Price: $125.00

RP 17G3
Design of Subsea Well Intervention Systems Using Non-Ferrous Alloys

Provides design guidelines for the use of non-ferrous materials in subsea intervention systems and components. Pages: 29

1st Edition | February 2021 | Product Number: G17G301 | Price: $107.00

RP 17G5
Subsea Intervention Workover Control Systems

Provides the requirements for the design, manufacture, and testing of intervention workover control system (IWOCS) equipment typically used in a thru-blowout preventer intervention riser system and an open-water intervention riser system.

Some requirements in this document are specific to the execution of end user-defined safety functions. This document defines “safety class control functions” used to operate safety class devices. This document provides guidance on the determination of safety class control functions based on the end user-provided safety functions. Pages: 42

1st Edition | November 2019 | Product Number: G17G501 | Price: $104.00

RP 17G6
Global Analysis of Subsea Well Intervention Systems

Provides guidelines for global riser analysis (GRA) of subsea well workover/intervention systems and is intended to serve as a common reference for designers. This recommended practice is not intended to replace existing API recommended practices and standards but rather to supplement them by illustrating accepted analysis practices and principles. The end users may elect to adopt a portion of or all the presented guidelines for global riser analysis, subject to their well-specific riser designs and any operational-related design constraints. Pages: 140

1st Edition | October 2023 | Product Number: G17G601 | Price: $174.00

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

Provides functional requirements and guidelines for ROV/ROT/AUV interfaces in subsea production fields for the petroleum and natural gas industries. It is applicable to both the selection and use of ROV/ROT/AUV interfaces related to subsea production equipment and provides guidance on design as well as the operational requirements for maximizing the potential of standardized equipment and design principles. This recommended practice (RP) identifies the issues to be considered when designing for ROV/ROT/AUV operations to interact with (or near) subsea production systems. The framework and specifications set out enables the user (whether they may be on the ROV/ROT/AUV side or production facility side) to design the appropriate interface for a specific application. These interfaces include subsea docking, recharging, data transfer, data harvesting, and mechanical intervention. Pages: 112

3rd Edition | July 2019 | Product Number: G17H03 | Price: $193.00

Spec 17J ◆■
Specification for Unbonded 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 API 17B for guidelines on the use of flexible pipes. The applications addressed by API 17J are sweet and sour service production, including export and injection applications. Production products include oil, gas, water, and injection chemicals. API 17J applies to both static and dynamic flexible pipes used as flowlines, risers, and jumpers. API 17J does not apply to flexible pipes for use in choke and kill line applications. Pages: 123

5th Edition | May 2024 | Effective Date: May 29, 2025
Product Number: G17J05 | Price: $170.00

■ This publication is a new entry in this catalog.

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

Spec 17K ◆
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. Pages: 96

3rd Edition | August 2017 | Reaffirmed: January 2022
Product Number: G17K03 | Price: $168.00

Spec 17L1
Specification for Ancillary Equipment for Flexible Pipes and Subsea Umbilicals

Defines the technical requirements for safe, dimensionally and functionally interchangeable 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 ancillary equipment used in flexible pipe systems and subsea umbilical systems, with reference to existing codes and standards where applicable. See API 17L2 for guidelines on the use of ancillary equipment. Pages: 326

2nd Edition | June 2021 | Product Number: G17L102 | Price: $232.00

RP 17L2
Recommended Practice for Ancillary Equipment for Flexible Pipes and Subsea Umbilicals

Provides guidelines for the design, materials selection, analysis, testing, manufacture, handling, transportation, installation, and integrity management of ancillary equipment for flexible pipes and umbilicals. It presents the current best practice for design and procurement of ancillary equipment, and gives guidance on the implementation of the specification for standard ancillary products. In addition, this document presents guidelines on the qualification of prototype products. Pages: 285

2nd Edition | June 2021 |Product Number: G17L202 | Price: $232.00

RP 17N
Recommended Practice on Subsea Production System Reliability, Technical Risk, and Integrity Management
(includes Addendum 1 dated May 2018)

Provides a structured approach that organizations can adopt to manage 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 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 nonstandard equipment, and all phases of projects, from feasibility studies to operation.

It does not prescribe the use of any specific equipment or limit the use of any existing installed equipment or 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 annex sections may only be of interest to a 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. Pages: 178

2nd Edition | June 2017 | Product Number: G17N02 | Price: $222.00

RP 17N *
Recommended Practice on Subsea Production System Reliability, Technical Risk, and Integrity Management—Russian
(includes Addendum 1 dated May 2018)

Russian translation of RP 17N.

2nd Edition | June 2017 | Product Number: G17N02R | Price: $222.00

RP 17O
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. Pages: 45

2nd Edition | July 2014 | Reaffirmed: February 2019
Product Number: G17002 | Price: $150.00

RP 17P
Recommended Practice for Subsea Structures and Manifolds

Addresses specific requirements and recommendations for subsea structures and manifolds, within the frameworks set forth by recognized and accepted industry specifications and standards. As such, it does not supersede or eliminate any requirement imposed by any other industry specification.

This recommended practice (RP) covers subsea manifolds and templates used for pressure control in both subsea production of oil and gas, and subsea injection services. Equipment within the scope of this RP includes production and injection manifolds; modular and integrated single satellite and multiwell templates; subsea processing and subsea boosting stations; flowline riser bases and export riser bases (FRB, ERB); pipeline end manifolds (PLEM); pipeline end terminations (PLET); T- and Y-connections; subsea isolation valve structures (SSIV); subsea controls and distribution structures; and associated protection structures. Pages: 76

2nd Edition | January 2019 | Product Number: GG17P02 | Price: $181.00

RP 17Q
Recommended Practice on Subsea Equipment Qualification

Provides suppliers, contractors, and operators with process-level guidance to qualify equipment intended for use in subsea applications. This document is intended to provide high-level guidance only, so that the petroleum and natural gas industry has a common set of principles to follow for equipment qualification. It is written to simplify the qualification process and to align associated expectations within individual organizations and within the industry. It is not intended to replace existing company processes or procedures. The application of this recommended practice is dependent on the stakeholder companies (qualifier and end user) accepting its use. Although developed for application to subsea equipment, the process described by the recommended practice can be applied to non-subsea equipment as well. Pages: 54

2nd Edition | May 2018 | Product Number: G17Q02 | Price: $166.00

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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 RP covers subsea flowline connectors and jumpers used for pressure containment in both subsea production of oil and gas, and subsea injection services. Pages: 68

2nd Edition | December 2022 | Product Number: G17R02 | Price: $150.00

RP 17S
Recommended Practice for the Design, Testing, and Operation of Subsea Multiphase Flow Meters

Provides recommendations for the sizing, specification, system integration, testing and operation of in-line subsea multiphase flow meters (MPFMs) for measurement of full stream, multiphase flow for well testing, allocation measurement, fiscal measurement, well management, and/or in flow assurance applications. This recommended practice includes wet gas flow meters as a subset of MPFMs. Pages: 45

2nd Edition | April 2022 | Product Number: G17S02 | Price: $112.00

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: $164.00

TR 17TR1 *
Evaluation Standard for Internal Pressure Sheath Polymers for High Temperature Flexible Pipes—Russian

Russian translation of TR 17TR1.

1st Edition | March 2003 | Product Number: G17TR11R | Price: $164.00

TR 17TR1 *■
Evaluation Standard for Internal Pressure Sheath Polymers for High Temperature Flexible Pipes—Ukrainian

Ukrainian translation of TR 17TR1.

1st Edition | March 2003 | Product Number: G17TR11U | Price: $164.00

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

1st Edition | June 2003 | Product Number: G17TR21 | Price: $126.00

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

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

The scope of this study is limited to completed subsea wells in the Gulf of Mexico (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: $164.00

TR 17TR3 *
An Evaluation of the Risks and Benefits of Penetrations in Subsea Wellheads Below the BOP Stack—Russian

Russian translation of TR 17TR3.

1st Edition | November 2004
Product Number: G17TR31R | Price: $164.00

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: $81.00

TR 17TR4 *
Subsea Equipment Pressure Ratings—Russian

Russian translation of TR 17TR4.

2nd Edition | May 2016 | Product Number: G17TR402R | Price: $81.00

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 (CISs). 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 (jumper arrangements, umbilical systems, etc.) but also the fluids to be conveyed, initially from the fluid manufacturers' facilities through to bunkering at the host facility and, ultimately, injection or usage at remote subsea locations.

The 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: $122.00

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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 (SPS) although it is envisaged that use of the document for specification purposes by the operators of such processes will assist in ensuring the completeness of requests to supply.

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: $122.00

TR 17TR7
Verification and Validation of Subsea Connectors

Provides requirements and recommendations for the verification and validation of subsea connectors. It is intended to serve as a common reference for designers, manufacturers, and users to improve the performance assessment of subsea connectors and to improve the reliability and integrity of subsea systems.

This technical report is applicable to subsea connectors along the vertical centerline of subsea hardware (i.e. tree, tubing head, tree cap, tree running tool, well control package connectors, and EDP connectors), the subsea wellhead, and the completion/workover riser. The methodology provided herein may also be used in other connector designs. Connectors outboard of the vertical centerline are addressed in API 17R. Pages: 25

1st Edition | April 2017 | Product Number: G17TR71 | Price: $107.00

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: 1) the completion of the well requires completion equipment or well control equipment assigned a pressure rating greater than 15,000 psia (15 ksi, 103.5 MPa) or a temperature rating greater than 350 °F (177 °C); 2) the maximum anticipated surface pressure including shut-in tubing pressure is greater than 15,000 psia (15 ksi, 103.5 MPa) on the seafloor for a well with a subsea wellhead or at the surface for a well with a surface wellhead; or 3) the flowing temperature is greater than 350 °F (177 °C) on the seafloor for a well with a subsea wellhead or at the surface for a well with a surface wellhead.Pages: 113

3rd Edition | July 2022 | Product Number: G17TR803 | Price: $179.00

TR 17TR9
Umbilical Termination Assembly (UTA) Selection and Sizing Recommendations

identifies and describes:

- technical, commercial, and installation risks associated with high-functionality umbilicals and umbilical terminations [resulting in large and heavy umbilical termination assemblies (UTAs)], especially with respect to installation;
- implications of decisions made early in the umbilical and subsea umbilical termination (SUT) planning, selection, and design phases, to ease the manufacturing, handling, and final umbilical/UTA installation;
- guidance on specification and sizing of umbilical terminations, including overall size, weight, and handling requirements.

This document acts as a reference guide during the early field development planning stage to ensure that due consideration is given to the implications of the size of UTAs and possible consequences during installation. It is intended to be used as a reference guide by end users and operators, UTA and umbilical manufacturers, installers, and front-end engineering design (FEED) companies. The intention is that the document will enable the currently inherent installation difficulties to be addressed up front by the UTA designers, prior to commencing SUT design and functionality definition. 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 operations reviews on a case-by-case basis. Pages: 53

1st Edition | August 2017 | Product Number: G17TR91 | Price: $129.00

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 specifiers, 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: $129.00

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: $100.00

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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 closure 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: $118.00

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: $150.00

TR 17TR16
Subsea Hydrocarbon Production Leak Detection Systems Using Process Data

Provides considerations and recommendations for design, operation, maintenance, and training related to leak detection on multiphase subsea production gathering systems and gas injection systems. The scope is limited to methods using internal process sensors to detect leaks that are identifiable from process data. This report does not cover leak detection for umbilical systems, subsea trees (upstream of subsea choke), well downhole tubing, water injection systems, and export pipelines. Pages: 31

1st Edition | December 2022
Product Number: G17TR1601 | Price: $112.00

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. Annex A specifies the minimum recommendations for the performance qualification testing and inspection testing requirements for wet insulation systems (insulations in direct contact with seawater). Annex B specifies the minimum recommendations for the performance qualification testing and inspection testing requirements for dry insulation systems (insulations not in direct contact with seawater). Pages: 33

2nd Edition | December 2023 | Product Number: G17U02 | Price: $86.00

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 API 14C, which provides guidance for topsides safety systems on offshore production facilities. Some sections of this document refer to API 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 API 14C and adopted in this recommended practice. Pages: 63

1st Edition | February 2015 | Reaffirmed: June 2020
Product Number: G17V01 | Price: $175.00

RP 17V *
Recommended Practice for Analysis, Design, Installation, and Testing of Safety Systems for Subsea Applications—Russian
(includes Errata 1 dated July 2015)

Russian translation of RP 17V.

1st Edition | February 2015 | Product Number: G17V01R | Price: $175.00

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. This document focuses on recommended design parameters for subsea capping stacks; guidelines for subsea capping stack operations; and guidelines for storing, preserving, maintaining, and testing a subsea capping stack. Pages: 69

2nd Edition | March 2021 | Product Number: G17W02 | Price: $155.00

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RP 17X
Recommended Practice for Subsea Pump Module Systems

Provides guidance for the design, manufacture, installation, and operation of subsea pumps, including rotary displacement and rotodynamic types for single phase, and multi-phase services. The recommended practice applies to all subsea pump modules placed at or above the mud line. This document describes subsea pump modules that are either directly designed or "marinized" for use in a offshore/marine environment. Potential applications include offshore use near subsea wells to boost production and enhance oil recovery (EOR) from partially depleted oil fields, or to boost flowline pressures to flow at higher rates or greater distances or when flowing subsea wells up to a surface facility. Pages: 80

1st Edition | February 2021 | Product Number: G17X01 | Price: $119.00

RP 17Y
Recommended Practice for Design, Testing, and Qualification of Subsea Chemical Injection Delivery Systems

Covers the design, specification, testing, qualification, installation, commissioning, and operation of subsea chemical injection delivery systems (excluding workover and subsurface equipment). It covers subsea chemical injection delivery systems from the chemical storage tank located on a host facility (onshore or offshore) to injection points subsea with a holistic approach. It discusses interfaces between topsides, subsea, and subsurface scopes, as well as between engineering, mechanical equipment, and controls. Pages: 62

1st Edition | April 2022 | Product Number: G17Y01 | Price: $119.00

RP 17Z ■
Medium Voltage Equipment Used on Subsea Production Systems

Covers the design, fabrication, testing, installation, and operation of subsea power systems. The scope includes single-phase and three-phase systems from 3 kVac to 69 kVac. It covers subsea installed electrical power equipment and the connections between the equipment. Pages: 42

1st Edition | January 2024 | Product Number: G17Z01 | Price: $92.00

COMPLETION EQUIPMENT

Spec 11D1 ◆
Packers and Bridge Plugs
(includes Addendum 1 dated April 2022 and Errata 1 dated October 2024)

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. Pages: 82

4th Edition | March 2021 | Product Number: G11D104 | Price: $155.00

Spec 14A ◆■
Subsurface Safety Valve and Annular Safety Valve Equipment

Provides the requirements for subsurface safety valves (SSSVs), annular safety valves (ASVs) and the secondary tools as defined herein necessary to operate the features included within them, including all components that establish tolerances and/or clearances that may affect performance or interchangeability of the SSSV or ASV components. It includes repair operations and the interface connections to control conduits and/or other equipment but does not cover the connections to the primary well conduit. Pages: 190

13th Edition | March 2024 | Effective Date: March 14, 2025
Product Number: G14A13 | Price: $285.00

Spec 14L ◆
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. Pages: 59

3rd Edition | June 2020 | Product Number: G14L03 | Price: $174.00

Spec 19AC/ISO 14998:2013 ◆
Specification for Completion Accessories

Provides requirements and guidelines for completion accessories, as defined herein, for use in the petroleum and natural gas industry. This international standard provides requirements for the functional specification and technical specifications, including design, design verification and validation, materials, documentation and data control, quality requirements, redress, repair, shipment, and storage. This international standard covers the pressure-containing, nonpressure-containing, load-bearing, disconnect/reconnect, tubing-movement, and opening-a-port functionalities of completion accessories. Products covered under another API or international specification are not included. Also not included are other products such as liner/tubing hangers, downhole well test tools, inflow control devices, surface-controlled downhole chokes, downhole artificial lift equipment, control lines and fittings, and all functionalities relating to electronics or fiber optics. This international standard does not cover the connections to the well conduit. Installation, application, and operation of these products are outside the scope of this international standard.

This edition of Spec 19AC is the modified national adoption of ISO 14998:2013. Pages: 63

1st Edition | September 2016 | Reaffirmed: February 2022
Product Number: G19AC01 | Price: $140.00

RP 19B ◆
Evaluation of Well Perforators
(includes Addendum 1 dated March 2023)

Describes standard procedures for evaluating the performance of perforating equipment so that representations of this performance may be made to the industry under a standard practice. The purpose of this recommended practice is to specify the materials and methods used to evaluate objectively the performance of perforating systems or perforators. Pages: 78

3rd Edition | July 2021 | Product Number: G019B3 | Price: $176.00

RP 19B *■
Evaluation of Well Perforators—Ukrainian
(includes Addendum 1 dated March 2023)

Ukrainian translation of RP 19B.

3rd Edition | July 2021 | Product Number: G019B3 | Price: $176.00

Std 19C
Measurement of and Specifications for Proppants Used in Hydraulic Fracturing and Gravel-Packing Operations

Provides standard testing procedures for evaluating proppants used in hydraulic fracturing and gravel-packing operations. The objective of this standard is to provide a consistent methodology for testing performed on hydraulic fracturing and/or gravel-packing proppants. These procedures have been developed to improve the quality of proppants delivered to the well site. They are for use in evaluating certain physical properties used in hydraulic fracturing and gravel-packing operations. Pages: 57

2nd Edition | August 2018 | Product Number: GX19C02 | Price: $142.00

*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.

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Std 19C *
Measurement of and Specifications for Proppants Used in Hydraulic Fracturing and Gravel-Packing Operations—Russian

Russian translation of Std 19C.

2nd Edition | August 2018 | Product Number: GX19C02R | Price: $142.00

Spec 19CI
Downhole Chemical Injection Devices and Related Equipment

Provides requirements for chemical injection devices intended for use in the worldwide petroleum and natural gas industry. This includes requirements for specifying, selecting, design verification, validation testing, manufacturing, quality control, testing, and preparation for shipping of chemical injection devices. These requirements include in-line debris screen systems, single-use shearable/frangible devices, and information on performance testing and calibration procedures.

The installation and retrieval of chemical Injection devices and systems is outside the scope of this document (see API 19G2 and API 19G3). Pages: 118

1st Edition | June 2019 | Product Number: G19CI01 | Price: $196.00

RP 19D
Measuring Conductivity of Proppants

Provides recommended testing procedures for evaluating proppants used in hydraulic fracturing and gravel-packing operations. The objective of the document is to provide consistent methodology for testing procedures used to measure performance of hydraulic-fracturing and/or gravel-packing proppants. The testing procedures in this document are not designed to provide values of proppant conductivity under downhole reservoir conditions. Long-term test data have shown that time, elevated temperatures, fracturing fluid residues, cyclic stress loading, embedment, formation fines and other factors further reduce fracture proppant pack conductivity. Pages: 45

2nd Edition | November 2021 | Product Number: GX19D02 | Price: $147.00

Spec 19E ■
Electrical and Electronic Components for use in Downhole Completion Equipment

Provides the requirements for electrical/electronic components and assemblies used in downhole completion equipment as they are defined herein for use in the petroleum and natural gas industries. Electrical/electronic components and assemblies related to equipment covered under API specifications such as API 11D1, API 14A, API 19AC, API 19CI, API 19ICV, API 19G1, API 19G2, and API 19V are included. Pages: 94

1st Edition | September 2024 | Product Number: G19E01 | Price: $179.00

Spec 19G1 ◆
Side-Pocket Mandrels
(includes Errata 1 dated June 2019, Errata 2 dated July 2019, and Addendum 1 dated October 2021)

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

This specification addresses standard side-pocket mandrel designs, as well as high-pressure and/or high-temperature (HPHT) equipment rated greater than 103.43 MPa (15,000 psi) and/or greater than 177 °C (350 °F) wellbore conditions as proffered by API 1PER15K-1. Pages: 62

2nd Edition | February 2019 | Product Number: G19G12 | Price: $137.00

Spec 19G2 ◆
Flow-Control Devices for Side-Pocket Mandrels
(includes Addendum 1 dated June 2022)

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. Pages: 116

2nd Edition | September 2020
Product Number: GX19G22 | Price: $213.00

Spec 19G3/ISO 17078-3:2009 ◆
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.

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

1st Edition | June 2011 | Product Number: GG19G301
Reaffirmed: September 2022 | Price: $180.00

RP 19G4/ISO 17078-4:2010
Practices for Side-Pocket Mandrels and Related Equipment

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

This edition of RP 19G4 is the identical national adoption of ISO 17078-4:2010. Pages: 48

1st Edition | June 2011 | Product Number: GG19G401
Reaffirmed: September 2022 | Price: $193.00

RP 19GLHB
Gas Lift Handbook
(includes Addendum 1 dated May 2023 and Addendum 2 dated November 2024)

Presents information on the following topics related to gas lift equipment: the basic principles of gas lift; gas lift equipment selection; how various types of gas lift equipment work; and how a gas lift system should be designed. Information is also included on monitoring, adjusting, regulating, and troubleshooting gas lift equipment. It is intended to familiarize operating personnel with the use of gas lift as an artificial lift system. Pages: 289

1st Edition | June 2020 | Product Number: G19GLHB01 | Price: $201.00

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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.

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Spec 19ICD
Inflow Control Devices

Provides requirements and guidelines for inflow control devices (ICDs) for both production and injection, 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, and quality requirements. Products covered by any other API specification, such as sand screens and sliding sleeves, are not included. Also not included are externally controlled downhole devices including interval control valves (ICVs). This specification does not cover the connections to the well conduit, the effects of corrosion, or ICDs designated for use in thermal recovery applications. Installation, application, and operation of these products are outside the scope of this specification. Pages: 58

1st Edition | May 2020 | Product Number: G19ICD01 | Price: $120.00

Spec 19ICV
Interval Control Valves

Provides the requirements for downhole interval control valves (ICVs) as they are defined herein for use in the petroleum and natural gas industries. Included are the minimum requirements for a functional specification, design verification, design validation of performance ratings, manufacturing, functional evaluations, shipping, handling, and storage. Also included are requirements for downhole control modules that are necessary for the defined operations of the ICV. Pages: 90

1st Edition | June 2023 | Product Number: G19ICV01 | Price: $117.00

Spec 19LH
Liner Hanger Equipment
(includes Addendum 1 dated May 2021)

Provides requirements for conventional and expandable liner systems, including liner hangers, liner packers, liner hanger packers, tie-back/polished-bore receptacles (TBR/PBRs), seal assemblies, setting adaptors/sleeves, and running/setting tools as defined herein for use in the oil and natural gas industry. This specification provides minimum requirements for the functional specification and technical specification, including design, design verification and validation, materials, quality control, documentation and data control, repair, shipment, and storage. Products covered by this specification apply only to applications within a conduit. Installation and field maintenance are outside the scope of this specification. Pages: 99

1st Edition | June 2019 | Product Number: G19LH01 | Price: $145.00

Spec 19OH
Openhole Isolation Equipment

Covers requirements and guidelines for openhole isolation equipment and bridge plugs as defined herein. Openhole isolation equipment includes swellable packers, inflatable packers, expandable packers, and openhole packers that are designed for use in the petroleum and natural gas industries. This specification provides requirements for design verification, design validation, manufacturing, quality, shipping, handling, storage, and related supporting topics.

Requirements for the end connections to the well conduit are not included in this specification. Also not covered are downhole anchoring devices (see API 11D1); cup-style packers; and requirements for the application, installation, and use of openhole isolation equipment. Equipment and technology covered by other API specifications and standards are exempted from this specification, such as:

- production packers,
- liner hanger systems,
- service tools,
- test tool packers.

Repairs, remanufacturing, and redress are excluded from this specification. Pages: 45

1st Edition | January 2018 | Product Number: G19OH1 | Price: $135.00

Spec 19OH *
Openhole Isolation Equipment—Russian

Russian translation of Spec 19OH.

1st Edition | January 2018 | Product Number: G19OH1R | Price: $135.00

Spec 19PT
Downhole Perforating Tools

Provides requirements and guidelines for the design and use of downhole perforating tools and related equipment, as defined herein for use in the petroleum and natural gas industry. This specification provides the requirements for reporting and validating operational ratings of downhole perforating tools that are not addressed by any current standards or specifications. Thus, it provides well-defined operational ratings for functionality of downhole perforating tools as provided by the supplier/manufacturer, and defines levels of quality control (QC) for downhole perforating tools including validation requirements, acceptance testing, performance ratings, and service center requirements. Pages: 46

1st Edition | May 2022 | Product Number: G19PT01 | Price: $99.00

Spec 19SS/ISO 17824:2009
Sand Screens
(includes Errata 1 dated November 2018)

Provides the requirements and guidelines for sand screens for use in the petroleum and natural gas industry. Included are the requirements for design, design validation, manufacturing, quality, storage, and transport. The requirements of this International Standard are applicable to wire-wrap screens, pre-pack screens, and metal-mesh screens.

The following items are outside the scope of this International Standard:

- expandable and/or compliant sand screens, slotted liners, or tubing and accessory items, such as centralizers or bull plugs;
- shunt screen technology, inflow control devices, downhole sensors, and selective isolation devices, even where they can be an integral part of the sand screen;
- analysis for sand retention efficiency;
- end connections of the basepipe.

This edition of Spec 19SS is the modified national adoption of ISO 17824:2009. Pages: 79

1st Edition | July 2018 | Product Number: G19SS01 | Price: $199.00

Spec 19TT
Specification for Downhole Well Test Tools and Related Equipment

Provides the requirements for downhole well test tools and related equipment as they are defined herein for use in the petroleum and natural gas industries. Included are the requirements for design, design validation, manufacturing, functional evaluation, quality, handling, storage, and service centers. Tools utilized in downhole well test operations include tester valves, circulating valves, well testing packers, safety joints, well testing safety valves, testing surface safety valves (TSSVs), slip joints, jars, work string tester valves, sampler carriers, gauge carriers, drain valves, related equipment, and tool end connections. This specification does not cover open hole well test tools, downhole gauges, samplers, surface equipment, subsea safety equipment, perforating equipment and accessories, pup joints external to well test tool assemblies, work string and its connections, conveyance or intervention systems, installation, control and monitoring conduits, and surface control systems. A downhole well test is an operation deploying a temporary completion in a well to safely acquire dynamic rates, formation pressure/temperature, and formation fluid data. Downhole well test tools are also used in operations of well perforating, well shut-ins, circulation control of fluids, and stimulation activities. This document covers the downhole tools used to perform these operations; however, the operational requirements of performing these operations are not included. Pages: 94

1st Edition | October 2016 | Product Number: G19TT01 | Price: $164.00

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Spec 19V ◆
Subsurface Completion Isolation (Barrier) Valves and Related Equipment
(includes Errata 1 dated September 2019 and Addendum 1 dated September 2022)

Provides the requirements for subsurface completion isolation (barrier) valves (SCIVs) and related equipment as they are defined herein for use in the petroleum and natural gas industries. Included are the requirements for design, design validation grades, quality levels, manufacturing, functional evaluation, repair, redress, handling, and storage. SCIVs provide a means of isolating the formation or creating a blockage in the tubular to facilitate the performance of pre- and/or post-production/injection operational activities in the well.

Additional requirements for HPHT products are included in Annex I. Pages: 81

2nd Edition | May 2019 | Effective Date: November 2019
Product Number: G19V02 | Price: $224.00

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

Identifies requirements for the foundry qualification, production, design, marking, and documentation of carbon steel, alloy steel, stainless steel, and nickel base alloy castings used in the petroleum and natural gas industries when referenced by an applicable API product standard or otherwise specified as a requirement for compliance. This specification applies to castings used in the manufacture of pressure-containing, pressure-controlling, and primary load-bearing components. Castings manufactured in accordance with this API specification may be produced using any industry standard casting method. Pages: 34

3rd Edition | July 2024 | Effective Date: July 28, 2025
Product Number: G20A03 | Price: $110.00

Spec 20B ◆
Open Die Shaped Forgings for Use in the Petroleum and Natural Gas Industry

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: 26

2nd Edition | November 2020 | Product Number: G20B02 | Price: $117.00

Spec 20B *■
Open Die Shaped Forgings for Use in the Petroleum and Natural Gas Industry—Chinese

Chinese translation of Spec 20B.

2nd Edition | November 2020
Product Number: G20B02C | Price: $117.00

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: 35

3rd Edition | April 2020 | Product Number: G20C03 | Price: $117.00

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

Chinese translation of Spec 20C

3rd Edition | April 2020 | Product Number: G20C03C | Price: $117.00

Std 20D
Qualification of Nondestructive Examination Services for Equipment Used in the Petroleum and Natural Gas Industry

Specifies requirements for the application of nondestructive examination (NDE) methods as well as the development and qualification procedures used in the manufacturing, servicing, and/or service of equipment for the petroleum and natural gas industries.

This is applicable to suppliers providing NDE services for equipment used in the oil and natural gas industries. The requirements of this standard apply to magnetic particle, liquid penetrant, radiography, and ultrasonic methods of NDE. Pages: 30

2nd Edition | August 2019 | Product Number: G20D02 | Price: $122.00

Std 20D *■
Qualification of Nondestructive Examination Services for Equipment Used in the Petroleum and Natural Gas Industry—Chinese

Chinese translation of Std 20D.

2nd Edition | August 2019 | Product Number: G20D02C | Price: $122.00

Spec 20E ◆■
Alloy and Carbon Steel Bolting for Use in the Petroleum and Natural Gas Industries

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 when required by an applicable API equipment standard or otherwise specified as a requirement for conformance. It establishes requirements for three bolting specification levels (BSLs). These three BSL designations define different levels of technical, quality, and qualification requirements: BSL-1, BSL-2, and BSL-3. The BSLs are numbered in increasing levels of requirements to reflect increasing technical, quality, and qualification criteria. Pages: 41

3rd Edition | March 2024| Effective Date: March 7, 2025
Product Number: G20E03 | Price: $109.00

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Spec 20F ◆
Corrosion-Resistant Bolting for Use in the Petroleum and Natural Gas Industries
(includes Errata 1 dated November 2020 and Addendum 1 dated November 2021)

Specifies requirements for the qualification, production, and documentation of corrosion-resistant bolting used in the petroleum and natural gas industries. This standard applies when referenced by an applicable API equipment standard or otherwise specified as a requirement for compliance.

This standard establishes requirements for two bolting specification levels (BSLs). These two BSL designations define different levels of technical, quality, and qualification requirements: BSL-2 and BSL-3. The BSLs are numbered in increasing levels of requirements in order to reflect increasing technical, quality, and qualification criteria. BSL-2 and BSL-3 are intended to be comparable to BSL-2 and BSL-3 as found in API 20E. BSL-1 is omitted from this standard. Pages: 32

2nd Edition | April 2018 | Product Number: G20F02 | Price: $108.00

Spec 20F *■
Corrosion-Resistant Bolting for Use in the Petroleum and Natural Gas Industries—Chinese
(includes Errata 1 dated November 2020 and Addendum 1 dated November 2021)

Chinese translation of Spec 20F.

2nd Edition | April 2018 | Product Number: G20F02C | Price: $108.00

Std 20G
Welding Services for Equipment Used in the Petroleum and Natural Gas Industry

Specifies requirements for the qualification of suppliers of welding services used in the manufacturer of equipment for the petroleum and natural gas industry. The requirements of this standard apply to welding operations performed in a welding facility or in the field. Included are pressure-containing, pressure-controlling, overlay, and structural welds. Pages: 37

1st Edition | January 2020 | Product Number: G20G01 | Price: $104.00

Std 20G *■
Welding Services for Equipment Used in the Petroleum and Natural Gas Industry—Chinese

Chinese translation of Std 20G.

1st Edition | January 2020 | Product Number: G20G01C | Price: $104.00

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

Specifies requirements for the qualification of suppliers of heat treatment services used in the manufacture of equipment for the petroleum and natural gas industries.

This standard is applicable to suppliers providing heat treatment services where API product standards require such services or otherwise specified as a requirement for conformance. The requirements of this standard apply to batch heat treatment operations that establish or affect the final mechanical properties and include stress relief operations. This standard applies to carbon steel, low-alloy steel, stainless steel, and nickel-base alloys. Case hardening, induction hardening, and flame hardening are not covered by this standard.

This standard establishes the requirements for three heat treatment specification levels (HSLs). These HSL designations define different levels of heat treatment technical, quality, and qualification requirements. Pages: 26

2nd Edition | April 2020 | Product Number: G20H02 | Price: $94.00

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

Chinese translation of Std 20H.

2nd Edition | April 2020 | Product Number: G20H02C | Price: $94.00

Std 20J
Qualification of Distributors of Metallic Materials for Use in the Petroleum and Natural Gas Industries

Specifies requirements for the qualification of distributors of metallic materials used in the petroleum and natural gas industries. This standard is applicable to distributors of metallic bar, plate, and tubular products where API product standards require such services or are otherwise specified as a requirement for conformance. Pages: 31

2nd Edition | April 2022 | Product Number: G20J02 | Price: $118.00

Std 20L
Qualification of Polymeric Seal Manufacturers for Use in the Petroleum and Natural Gas Industries

Specifies requirements for the qualification of manufacturers of polymeric seals used in the petroleum and natural gas industries. This standard is applicable to the manufacturers of polymeric seals where API product standards require such services or are otherwise specified as a requirement for compliance. This standard does not consider entities that solely perform assembly of outside manufactured parts as a polymeric seal manufacturer. Pages: 28

1st Edition | April 2018 | Product Number: G20L01 | Price: $81.00

Std 20L *■
Qualification of Polymeric Seal Manufacturers for Use in the Petroleum and Natural Gas Industries—Chinese

Chinese translation of Std 20L.

1st Edition | April 2018 | Product Number: G20L01C | Price: $81.00

Std 20M
Qualification of Suppliers of Machining Services for Use in the Petroleum and Natural Gas Industries

Specifies requirements for the qualification of suppliers of machining services where API product standards require such services or are otherwise specified as a requirement for compliance. Compliance with this standard is not required to demonstrate compliance with any other API standard or specification. This API standard establishes the requirements for three machining qualification levels (MQL 1, MQL 2, and MQL 3). These three MQL designations define different levels of quality and qualification requirements. These MQLs are numbered in increasing levels of requirements in order to reflect increasing quality and qualification criteria.

Final assembly, component testing (e.g. nondestructive examination, pressure testing) or a broker of machining services are outside the scope of this standard. This standard applies when specified by the customer or voluntarily followed by the machining services supplier. Pages: 27

1st Edition | October 2017 | Product Number: G20M01 | Price: $89.00

Std 20M *■
Qualification of Suppliers of Machining Services for Use in the Petroleum and Natural Gas Industries—Chinese

Chinese translation of Std 20M.

1st Edition | October 2017 | Product Number: G20M01C | Price: $89.00

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Std 20N
Heat Treatment Services—Continuous Line for Equipment Used in the Petroleum and Natural Gas Industry

Specifies requirements for the qualification of suppliers of continuous line heat treatment services used in the manufacture of equipment for the petroleum and natural gas industries.

This standard is applicable to suppliers providing heat treatment services where API product standards specify this standard as a requirement for conformance. The requirements of this standard apply to continuous and semi-continuous heat treatment operations that can establish or affect the final mechanical properties. For batch type heat treatment, refer to API 20H. This standard is applicable to products in tubular, bar, plate, forgings, castings, and upset forged forms. Heat treat that imparts surface hardening or case hardening is outside the scope of this document. Pages: 27

1st Edition | August 2019 | Product Number: G20N01 | Price: $99.00

Std 20N *■
Heat Treatment Services—Continuous Line for Equipment Used in the Petroleum and Natural Gas Industry—Chinese

Chinese translation of Std 20N.

1st Edition | August 2019 | Product Number: G20N01C | Price: $99.00

Std 20P ■
Qualification of Applicators of Coating/Plating Services for Equipment Used in the Petroleum and Natural Gas Industries

Specifies requirements for the qualification of organizations providing coating/plating services for use in the petroleum and natural gas industries. This standard is applicable to the coating/plating of parts, components, and equipment, in which API product standards require conformance with this standard or otherwise specified as a requirement. Pages: 19

1st Edition | May 2024 | Product Number: G20P01 | Price: $80.00

Std 20S
Additively Manufactured Metallic Components for Use in the Petroleum and Natural Gas Industries

Specifies requirements for qualification of the manufacturing process, production, marking, and documentation of additively manufactured metallic components used in the petroleum and natural gas industries when referenced by an applicable API equipment standard or otherwise specified as a requirement for conformance. This standard applies to additively manufactured metallic components produced by powder bed fusion (PBF), directed energy deposition (DED), and binder jetting (BJT) processes. This standard establishes requirements for three additive manufacturing specification levels (AMSL). These three AMSL designations—AMSL 1, AMSL 2, and AMSL 3—define increasing levels of additive manufacturing technical, quality, and qualification requirements. Pages: 47

1st Edition | October 2021 | Product Number: G20S01 | Price: $126.00

Std 20T
Additively Manufactured Polymer-Based Components for Use in the Petroleum and Natural Gas Industries

Specifies requirements for qualification of the manufacturing process, production, marking, and documentation of additively manufactured polymer-based components used in the petroleum and natural gas industries when referenced by an applicable API equipment standard or otherwise specified as a requirement for conformance. This standard applies to additively manufactured polymer-based components (including composites) produced by material extrusion [also referred to as fused filament fabrication (FFF) or fused deposition modeling (FDM) and fused granulate fabrication (FGF)] and powder bed fusion [also referred to as selective laser sintering (SLS) or multi jet fusion (MJF)]. Additive manufacturing provides the natural gas and oil industry significant efficiency and productivity improvements, cuts lead times and supply chain stress, streamlines transportation and logistics, and can reduce emissions because additive manufacturing takes place near the point of use. Pages: 39

1st Edition | August 2022 | Product Number: G20T01 | Price: $99.00

TR 21B ■
Round Robin Test Program for Development of Hardness Conversions for Precipitation Hardened Nickel Alloys and Martensitic Stainless Steels

Provides the data necessary to develop two independent sets of hardness conversions, one for precipitation hardened nickel alloys (PHNA) and the other for martensitic stainless steels (MSS), that could be used to ballot two new hardness conversion tables with corresponding hardness conversion equations for ASTM Standard E140. Pages: 112

1st Edition | June 2024 | Product Number: G21B01 | Price: $128.00

TR 21D ■
A Study of the Effect of Thread Forming on the Susceptibility of Precipitation Hardened Ni-Based Alloy Fasteners to Hydrogen Embrittlement

Quantifies the hardness profile of both machined and rolled threads in precipitation hardened nickel-based alloys (PHNAs); studies the effects of both machined and rolled threads on hydrogen induced stress cracking (HISC) susceptibility in relevant PHNAs; tests these PHNA grades used for bolting per the requirements of API standards; and provides guidance for the use of the selected testing methodology and resultant test data in the petroleum and natural gas industry. Pages: 42

1st Edition | August 2024 | Product Number: G21D01 | Price: $88.00

TR 21TR1
Materials Selection for Bolting
(includes Addendum 1 dated April 2020, Addendum 2 dated June 2020, and Addendum 3 dated May 2022)

Provides guidance for the selection of materials and manufacturing processes for low-alloy steel bolting manufactured in accordance with API 20E and nickel-based and stainless alloys manufactured in accordance with 20F. Table 2 and Table 3 are provided as guidance for materials selection of fasteners. Pages: 37

1st Edition | August 2019 | Product Number: G21TR101 | Price: $114.00

TR 21TR2
S-N Fatigue Design Guidelines and Test Data for Low-Alloy Steel Bolts

New API-backed research on the fatigue life of bolts used in underwater natural gas and oil infrastructure—including critical blowout prevention equipment—resulted in the publication of this technical report, a key advancement in industry's continued efforts to protect workers and the environment from potential problems associated with bolting fatigue in subsea structures. The test program detailed in this technical report was developed to obtain bolting material fatigue data required to perform design verification analysis of fatigue-sensitive bolts to assure accurate design life estimation. The bolting fatigue testing program provided S-N fatigue curves for three alternating stress ranges in air and saltwater with cathodic protection (CP) and for bolt sizes of 1 in., 2 in. (Grade L7), and 3 in. (Grade L43). S-N curves are used to determine the number of cycles (N) required to test a product to failure at a given stress (S). The results of these S-N fatigue tests allow the bolting design to be assessed for this type of fatigue through structural analysis using the nominal root area stresses in the bolt, avoiding the need to define stress and load concentrations in the bolt root radius of engaged threads. Pages: 32

1st Edition | March 2022 | Product Number: G21TR201 | Price: $108.00

*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.

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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

1st Edition | August 1997 | Reaffirmed: February 2014
Product Number: G31A01 | Price: $120.00

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

3rd Edition | August 1998 | Reaffirmed: February 2014
Product Number: G45003 | Price: $177.00

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: $56.00

RP 90-1
Annular Casing Pressure Management for Offshore Wells
(formerly RP 90)

Covers the management of annular casing pressure in existing offshore wells to maintain integrity and manage risk. It covers a range of casing annuli pressures including thermal casing pressure, sustained casing pressure (SCP), and operator-imposed pressure. This document also addresses monitoring, diagnostic testing, establishing maximum allowable wellhead operating pressure (MAWOP), and documentation of annular casing pressure for the various types of wells that occur offshore. Included 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 thresholds. This document includes information regarding annular casing pressure that is applicable to various offshore well types to include fixed platform wells, subsea wells, hybrid wells, and mudline suspension wells. Pages: 85

2nd Edition | August 2021 | Product Number: G09002 | Price: $261.00

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: $226.00

RP 92C ■
Managed Pressure Drilling Operations—Controlled Mud Level with a Subsea Blowout

Provides information for planning, installation, testing, and operation of wells drilled, cased, cemented, completed, or abandoned with controlled mud level (CML) managed pressure drilling (MPD). This document applies only to drilling rigs with a marine drilling riser and subsea blowout preventers (BOPs). This document considers situations where the total drilling operation is performed balanced or overbalanced, including both hydrostatically overbalanced and when mud level is reduced during circulation to a level where supplemental annular friction pressure may be required to stay overbalanced. Pages: 47

1st Edition | September 2024 | Product Number: G92C01 | Price: $80.00

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: $87.00

To purchase individual API standards, visit apiwebstore.org

RP 92M
Managed Pressure Drilling Operations with Surface Back-Pressure
(includes Addendum 1 dated April 2023 and Errata 1 dated November 2023)

Provides information for planning, installation, testing, and operation of wells drilled with surface backpressure managed pressure drilling (MPD). This document applies only to drilling rigs with surface blowout preventers (BOPs).

This document considers situations where the total drilling operation is performed balanced or overbalanced, including both hydrostatically overbalanced (no supplemental surface pressure needed to control inflow) and hydrostatically underbalanced (supplemental surface pressure needed to control inflow) systems. For underbalanced operations, refer to API 92U.

This document does not cover MPD operations with subsea BOP stacks. Pages: 33

1st Edition | September 2017 | Product Number: G92M01 | Price: $122.00

RP 92P
Managed Pressure Drilling Operations—Pressurized Mud Cap Drilling with a Subsea Blowout Preventer

Addresses recommended practices for pressurized mud cap drilling (PMCD) from a floating rig with a subsea BOP stack. When massive lost circulation conditions are encountered, PMCD can be implemented to allow well construction operations to continue.

Although this document only addresses PMCD, most of the equipment described may also be used for the surface back-pressure (SBP) method of managed pressure drilling. However, much of the equipment used for SBP is not required for PMCD and is beyond the scope of this document. Pages: 67

1st Edition | June 2019 | Product Number: G92P01 | Price: $142.00

RP 92S
Managed Pressure Drilling Operations—Surface Back-Pressure with a Subsea Blowout Preventer
(includes Addendum 1 dated April 2023)

Provides information for planning, installation, testing, and operation of wells drilled with surface back-pressure (SBP) managed pressure drilling (MPD). This document applies only to drilling rigs with subsea blowout preventers (BOPs). This document considers situations where the total drilling operation is performed balanced or overbalanced, including both hydrostatically overbalanced (no supplemental surface pressure needed to control inflow) and hydrostatically underbalanced (supplemental surface pressure needed to control inflow) systems. Pages: 64

1st Edition | September 2018 | Product Number: G92S01 | Price: $152.00

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

1st Edition | November 2008 | Reaffirmed: April 2013
Product Number: G92U01 | Price: $130.00

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: $217.00

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: $71.00

■ 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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RP 97L
Onshore Well Construction Interface Document

Provides guidance on information that is to be shared regarding onshore well construction and rig-specific operating guidelines. It is intended to align the lease operator's and drilling contractor's safety and environmental management systems (SEMS). The purpose of the well construction interface document (WCID) is to enhance the health and safety of the workers and protect the environment by facilitating communication between the lease operator and drilling contractor regarding well construction work (drilling, suspension, completion, testing, and abandonment). Pages: 24

1st Edition | December 2020 | Product Number: G97L01 | Price: $85.00

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: $162.00

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: $87.00

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 | Reaffirmed: August 2020
Product Number: G100101 | Price: $113.00

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

Ukrainian translation of RP 100-1.

1st Edition | October 2015 | Reaffirmed: August 2020
Product Number: G100101U | Price: $113.00

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:

- baseline groundwater sampling;
- source water management;
- material selection;
- 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 | Reaffirmed: August 2020
Product Number: G100201 | Price: $113.00

RP 100-3 ■
Community Engagement
(includes Errata 1 dated April 2024)

Aims to help ensure that safe and responsible development of oil and natural gas resources is achieved with community and stakeholder input. API has revised the guidance within this document to address ongoing changes in industry practices, stakeholder expectations, and increased digital engagement. These updated guidelines include common communications and practices described by member company representatives, additional information regarding approaches for virtual engagement with stakeholders, emerging practices regarding environmental justice, and strategies and techniques highlighted by member companies and stakeholders. Pages: 41

2nd Edition | April 2024 | Product Number: G100-302 | 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

3rd Edition | January 1994 | Reaffirmed: March 2007
Product Number: GVT063 | Price: $170.00

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

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

5th Edition | June 1996 | Reaffirmed: March 2007
Product Number: GVT015 | Price: $170.00

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

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

3rd Edition | January 1995 | Reaffirmed: March 2007
Product Number: GVT033 | Price: $105.00

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

3rd Edition | January 1994 | Reaffirmed: March 2007
Product Number: GVT053 | Price: $132.00

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

5th Edition | November 2016 | Product Number: GT1005 | Price: $81.00

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: GT2002 | Price: $75.00

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: $65.00

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

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

1st Edition | October 2002 | Reaffirmed: January 2013
Product Number: GT0601 | Price: $75.00

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

2nd Edition | October 1995 | Reaffirmed: January 2013
Product Number: GT7002 | Price: $62.00

RP T-8
Fundamental Safety Training for Offshore Personnel

Provides guidance on the components of an effective training system related to offshore health, safety, and environment (HSE). A common safety training matrix is provided that outlines the fundamental recommended HSE training for offshore personnel. This matrix can be used in conjunction with other applicable recommended training and company-specific requirements. Pages: 24

1st Edition | January 2019 | Product Number: GT8001 | Price: $79.00

COMMUNITY ENGAGEMENT

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: $89.00

■ This publication is a new entry in this catalog.

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RP 100-3 ■
Community Engagement
(includes Errata 1 dated April 2024)

Aims to help ensure that safe and responsible development of oil and natural gas resources is achieved with community and stakeholder input. API has revised the guidance within this document to address ongoing changes in industry practices, stakeholder expectations, and increased digital engagement. These updated guidelines include common communications and practices described by member company representatives, additional information regarding approaches for virtual engagement with stakeholders, emerging practices regarding environmental justice, and strategies and techniques highlighted by member companies and stakeholders. Pages: 41

2nd Edition | April 2024 | Product Number: G100-302 | Price: $80.00

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

RP 54
Occupational Safety and Health for Oil and Gas Well Drilling and Servicing Operations
(includes Addendum 1 dated June 2021)

Recommends practices and procedures for promoting and maintaining safe and healthy working conditions for personnel in drilling and well servicing operations. These recommendations apply to rotary drilling rigs, well servicing rigs, and special services as they relate to operations on location. It is intended that the applicable requirements and recommendations of some sections of the standard be applied, as appropriate, to other sections. The recommendations are not intended to cover seismic drilling or water well drilling operations. These recommendations do not apply to site preparation and site remediation operations. Pages: 62

4th Edition | February 2019 | Product Number: G54004 | Price: $168.00

RP 67
Recommended Practice for Oilfield Explosives Safety

Applicable to chemical explosives used as an energy source to do work in oil- and gas-producing operations, and more specifically to explosives intended for use inside a wellbore. The purpose of this recommended practice (RP) is primarily to prevent the inadvertent initiation of these explosives at the wellsite but also includes some recommendations for safe and secure storage and transportation and handling, as well as requirements for design and manufacture of selected equipment.

While some chemicals intended for various nonexplosive applications can prove explosive when misused (such as lithium batteries), it is not the intent of this RP to address these materials. Pages: 85

3rd Edition | October 2019 | Product Number: G06703 | Price: $147.00

RP 74
Recommended Practice for Occupational Safety for Onshore Oil and Gas Production Operation

Recommends practices and procedures for promoting and maintaining safe working conditions for personnel engaged in onshore oil and gas production operations, including special services. Pages: 23

1st Edition | October 2001 | Reaffirmed: January 2013
Product Number: G74001 | Price: $77.00

RP 75
Safety and Environmental Management System for Offshore Operations and Assets

Provides companies engaged in offshore operations with a framework for the establishment, implementation, and maintenance of a Safety and Environmental Management System (SEMS) to manage and reduce risks associated with safety and the environment to prevent incidents and events.

This recommended practice applies, in part or whole, to companies engaged in offshore operations, from lease evaluation through decommissioning.

This document is not intended to be prescriptive or limiting on the expectations of each SEMS element; rather, it allows flexibility appropriate to the size, scope, and risk of a Company's assets and operations. It is advised that users of this document review and comply with applicable legal and regulatory requirements, and conform with applicable industry codes and standards.

Consideration may be given to using this document to help systematically manage other aspects of operations, such as security and health. Pages: 34

4th Edition | December 2019 | Product Number: G07504 | Price: $132.00

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: $37.00

RP 75W ■
Safety and Environmental Management System for Offshore Wind Operations and Assets

Provides companies engaged in offshore operations in the offshore wind energy sector with a framework for the establishment, implementation, and maintenance of a Safety and Environmental Management System (SEMS) to manage and reduce risks associated with safety and the environment to prevent incidents and unplanned events. This recommended practice applies, in part or whole, to companies engaged in offshore operations, through the project life cycle.Pages: 32

1st Edition | July 2024 | Product Number: G75W01 | Price: $87.00

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: $71.00

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RP 77
Risk-Based Approach for Managing Hydrocarbon Vapor Exposure During Tank Gauging, Sampling, and Maintenance of Onshore Production Facilities

Covers recommended risk assessment and risk management practices to reduce the potential for acute worker hydrocarbon exposures and related atmospheric risks (i.e. potential oxygen deficiency). Specifically, this recommended practice is limited to onshore production tanks (including flowback tanks) during gauging and sampling, open-top tank sampling, and select tank maintenance activities involving removal or opening of tank appurtenances. While the tools and practices recommended in this document can be useful in other operations, this recommended practice does not specifically apply to downstream, refining, or offshore tank applications. Pages: 30

1st Edition | June 2018 | Product Number: G07701 | Price: $107.00

Bull 4785 ■
Cold Weather Hazards and Winterizing Operating Considerations for U.S. Onshore Upstream Facilities

Addresses the issues encountered by infrequent freezing events that can occur in moderate climates, and encourages upstream onshore operators to review winterizing programs and integrate appropriate considerations into written facility operating and emergency programs and procedures. Pages: 20

1st Edition | August 2024 | Product Number: G478501 | Price: $69.00

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: $311.00 | Template Only: Price: $103.00

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

2nd Edition | December 1990 | Reaffirmed: June 2000
Product Number: G11000 | Price: $154.00

Bull E4
Environmental Guidance Document: Release Reporting for the Oil and Gas Exploration and Production Industry as Required by the Clean Water Act, the Comprehensive Environmental Response, Compensation and Liability Act, and the Emergency Planning and Community

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: $183.00

RP 1145
Preparation of Response Plans for Oil Spills from Offshore Facilities

Provides information and guidance for the development of Oil Spill Response Plans for the offshore U.S. oil and gas exploration, production, and transportation (pipeline) industry. The general plan concepts, layout, and content recommended in this document are also applicable to other types of coastal/marine assets, both in the U.S. and international locations.

This RP is intended to provide plan developers and writers with information and guidance for effective and functional Oil Spill Response Plans that fulfill the expectations of plan holders, responders, regulators, response officials, stakeholders, and the general public. This RP may be informative for any company, organization, or public agency that oversees or responds to oil spills.

Although plans prepared or modified using this RP can be used to replace existing response plans required by regulation, the RP is not intended to be a regulatory compliance guideline or to supersede current regulations. Pages: 140

2nd Edition | February 2018 | Product Number: D11452 | Price: $150.00

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: $133.00

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To purchase individual API standards, visit apiwebstore.org

HEALTH, ENVIRONMENT, AND SAFETY: NATURALLY OCCURRING RADIOACTIVE MATERIALS

Bull E2
Management of Naturally Occurring Radioactive Materials (NORM) in Oil and Gas Production

Naturally occurring radioactive materials (NORM) are present in oil and gas operations at some locations and can deposit in well tubulars, surface piping, vessels, pumps, and other producing and processing equipment. The purpose of this document is to inform oil and gas operators of the possible presence of NORM and to provide relevant information on protecting workers, the public, and the environment. The objective of this document is to provide general information to users so that they have an understanding of the fundamental radiation issues associated with the management of NORM. Issues where the advice of a professional health physicist, industrial hygienist, or other technical expert may be useful are identified and guidance provided. Readers are advised to contact their state regulatory office and work very closely with that office on all NORM issues. Pages: 50

2nd Edition | March 2006 | Product Number: GE2002 | Price: $133.00

Publ 7100
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: $124.00

Publ 7101
A National Survey on Naturally Occurring Radioactive Material (NORM) in Petroleum Producing and Gas Processing Facilities

Defines the general occurrence of NORM in the United States based on statistical analysis of gamma measurements taken external to certain petroleum producing and gas processing equipment. Pages: 265

October 1997 | Product Number: G71011 | Price: $124.00

Publ 7102
Methods for Measuring Naturally Occurring Radioactive Materials (NORM) in Petroleum Production Equipment

The use and capabilities of common field-survey equipment are characterized for measuring NORM in sludges and scales accumulated in oil and gas production equipment. A correlation between radium concentrations in accumulated scales and sludges and measured external radiation is presented. Pages: 85

October 1997 | Product Number: G71021 | Price: $124.00

Publ 7103
Management and Disposal Alternatives for Naturally Occurring Radioactive Material (NORM) Wastes in Oil Production and Gas Plant Equipment

Presents radiological analyses of disposal alternatives that will protect against elevated radiation exposures and facilitate cost-effective precautions that are proportionate to any hazards posed by the NORM. Four waste forms and 12 waste disposal alternatives were analyzed. Pages: 65

October 1997 | Product Number: G71031 | Price: $124.00

Publ 7104
Proceedings of the 1995 API and GRI Naturally Occurring Radioactive Material (NORM) Conference

A compilation of 17 papers presented at the 1995 API/GRI NORM Conference. Subjects include measurement and survey; regulatory issues and activities; management and disposal; and scale prediction and control. Pages: 225

October 1997 | Product Number: G71041 | Price: $155.00

Publ 7105
Probabilistic Estimates of Dose and Indoor Radon Concentrations Attributable to Remediated Oilfield Naturally Occurring Radioactive Material (NORM)

Evaluates the concentration limit of 30 pCi/g Ra-226 in pipe scale and sludge left near the surface of remediated oilfield sites and returned to unrestricted public use. Includes an extensive bibliography of NORM research. Pages: 97

October 1997 | Product Number: G71051 | Price: $124.00

HEALTH, ENVIRONMENT, AND SAFETY: WASTE

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

March 2001 | Product Number: G00004 | For a free copy of this document, please visit https://www.api.org/oil-and-natural-gas/environment/environmental-performance/environmental-stewardship/waste-management-facilities

Protecting Livestock: Answers to Frequently Asked Questions about Livestock Exposure to Crude Oil in Oilfield Operations

Describes ways livestock might be significantly exposed to petroleum hydrocarbons via a conceptual site model and outlines how to make a screening level determination of whether or not livestock are at risk from the exposure.

2006 | Product Number: I0PL06 | For a free copy, please visit http://www.api.org/~/media/Files/EHS/Environmental_Performance/LIVESTOCK_EXPOSURE_BROCHURE_FINAL.pdf

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: $136.00

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SECURITY

RP 70
Security for Offshore Oil and Natural Gas Operations

Intended to assist the offshore oil and natural gas drilling and producing operators and contractors in assessing security needs during the performance of oil and natural gas operations. It includes information on security awareness, conducting security vulnerability assessments when warranted, and developing security plans for offshore facilities. Pages: 16

1st Edition | March 2003 | Reaffirmed: September 2010
Product Number: G07001 | Price: $71.00

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: $77.00

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MANUAL OF PETROLEUM MEASUREMENT STANDARDS

API currently maintains a comprehensive *Manual of Petroleum Measurement Standards* (*MPMS*). This manual is an ongoing project, as new chapters and revisions of old chapters will be released periodically.

Manual of Petroleum Measurement Standards (Complete Set)

The price of the complete set is subject to change as new chapters and sub-chapters are released; an order for one complete set would not include the chapters released after the release date of this catalog (but before order receipt) and the binders to house the set.

NOTE Chapter 11 standards, Chapter 19 standards, and Spanish translations must be ordered separately.

Price: $9,517.00 | *Price subject to change (If purchased individually, a complete set would cost approximately $10,815.00)

Chapter 1 [Historical]
Vocabulary

Provides terms and definitions used throughout the API *Manual of Petroleum Measurement Standards* (*MPMS*). Pages: 70

2nd Edition | July 1994 | Product Number: H01002 | Price: $118.00

Current terms and definitions may be accessed through the Ch. 1 database: https://chapter1.api.org

Chapter 1 * [Historical]
Vocabulary—Spanish

Spanish translation of Ch. 1.

2nd Edition | July 1994 | Product Number: H010SP | Price: $118.00

Chapter 2
Tank Calibration

Procedures necessary for calibrating closed storage vessels larger than a drum, and methods for computing the volumes contained therein. The following API standards cover the subject of tank calibration and are included in the manual.

Chapter 2.2A
Measurement and Calibration of Upright Cylindrical Tanks by the Manual Tank Strapping Method

Describes the procedures for calibrating upright cylindrical tanks used primarily for the storage of petroleum liquids. Chapter 2.2A first addresses procedures for making necessary measurements to determine total and incremental tank volumes, then presents the recommended procedures for computing incremental volumes at each liquid level. This includes improving existing calculation procedures as deemed necessary. In terms of determining the average inside radius at each liquid level, this standard is focused on the manual tank strapping method. While other parts of Chapter 2.2 cover methods to determine the average radius at each liquid level by alternate means, this standard is the reference standard for those parts (e.g. 2.2A, 2.2B, 2.2C, 2.2D and 2.2G). All aspects (e.g. physical bottom surveys) not covered in the other parts of Chapter 2 are covered by this standard. Pages: 91

2nd Edition | November 2019
Product Number: H022A2 | Price: $241.00

Chapter 2.2B
Calibration of Upright Cylindrical Tanks Using the Optical Reference Line Method

(includes Addendum 1 dated October 2019)

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

1st Edition | March 1989 | Reaffirmed: March 2019
Product Number: H30023 | Price: $103.00

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

1st Edition | January 2002 | Reaffirmed: September 2018
Product Number: H022C1 | Price: $103.00

Chapter 2.2D/ISO 7507-4:1995
Calibration of Upright Cylindrical Tanks Using the Internal Electro-Optical Distance Ranging Method

(includes Errata 1 dated January 2021)
(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

1st Edition | August 2003 | Reaffirmed: March 2014
Product Number: H022D1 | Price: $103.00

Chapter 2.2E/ISO 12917-1:2002
Petroleum and Liquid Petroleum Products—Calibration of Horizontal Cylindrical Tanks—Part 1: Manual Methods

(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

1st Edition | April 2004 | Reaffirmed: August 2014
Product Number: HX202E01 | Price: $110.00

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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. Pages: 14

1st Edition | April 2004 | Reaffirmed: September 2014
Product Number: HH202F01 | Price: $95.00

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. Pages: 14

1st Edition | July 2014 | Reaffirmed: November 2019
Product Number: H202G01 | Price: $100.00

Std 2552
Measurement and Calibration of Spheres and Spheroids

Describes the procedures for calibrating spheres and spheroids, which are used as liquid containers. It outlines the procedures for the measurement and calibration of spherical tanks. Pages: 17

1st Edition | October 1966 | Reaffirmed: August 2018
Product Number: H25520 | Price: $120.00

Std 2554
Measurement and Calibration of Tank Cars

Describes the procedures for calibrating tank cars. It outlines procedures for nonpressure-type tank cars and pressure-type tank cars. Pages: 41

1st Edition | October 1966 | Reaffirmed: September 2012
2-Year Extension: December 2017
Product Number: H25540 | Price: $143.00

Std 2555
Liquid Calibration of Tanks

Describes the procedure for calibrating tanks, or portions of tanks, larger than a barrel or drum by introducing or withdrawing measured quantities of liquid. Pages: 14

1st Edition | September 1966 | Reaffirmed: May 2014
Product Number: H25550 | Price: $120.00

RP 2556
Correcting Gauge Tables for Incrustation

Incrustation is defined in this document as any material that adheres to the internal vertical sidewall surfaces of a tank when the tank is otherwise empty. The tables given in this recommended practice show the percent of error of measurement caused by varying thicknesses of uniform incrustation in tanks of various sizes. Pages: 3

2nd Edition | August 1993 | Reaffirmed: November 2023
Product Number: H25560 | Price: $94.00

Chapter 2.7
Calibration of Barge Tanks
(includes Addendum 1 dated September 2021)

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. Pages: 25

1st Edition | March 1991 | Reaffirmed: January 2014
Product Number: H30044 | Price: $75.00

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. Pages: 22

1st Edition | March 1991 | Reaffirmed: November 2023
Product Number: H30049 | Price: $112.00

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. Pages: 26

1st Edition | September 1995 | Reaffirmed: November 2019
Product Number: H028B1 | Price: $120.00

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
(includes Errata 1 dated January 2021)

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, and
- the influences that may affect the position of gauging reference point (either the datum plate or the reference gauge point).

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

The method used to determine the volume of tank contents determined from gauge readings is not covered in this standard. The determination of temperature, API gravity, and suspended sediment and water of the tank contents are not within the scope of this standard. Pages: 31

3rd Edition | August 2013 | Reaffirmed: December 2018
Product Number: H301A03 | Price: $125.00

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Chapter 3.1A *
Standard Practice for the Manual Gauging of Petroleum and Petroleum Products—Spanish
(includes Errata 1 dated January 2021)

Spanish translation of Ch. 3.1A.

3rd Edition | August 2013 | Reaffirmed: December 2018
Product Number: H301A03S | Price: $125.00

Chapter 3.1B
Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Tanks by Automatic Tank Gauging

Covers the level measurement of liquid hydrocarbons in stationary, aboveground, atmospheric storage tanks using automatic tank gauges (ATGs). The standard discusses automatic tank gauging in general, accuracy, installation, commissioning, calibration, and verification of ATGs that measure either innage or ullage. It also covers both intrusive and non-intrusive ATGs used for either custody transfer or inventory control, as well as the requirements for data collection, transmission, and receiving. Pages: 27

4th Edition | October 2021 | Product Number: H301B4 | Price: $200.00

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.

4th Edition | October 2021 | Product Number: H301B4S | Price: $200.00

Chapter 3.2
Standard Practice for Gauging Petroleum and Petroleum Products in Tank Cars

Provides method for measuring liquids and liquefied gases in tank cars by liquid level measurement. Measurement of both vapor space and liquid level are covered. Gauging and temperature measurement equipment used in both open and closed measurement systems are described in this standard. These procedures reduce variability in the results of measurement and sampling operations when comparing loading terminal data to unloading terminal data. Pages: 20

1st Edition | August 1995 | Reaffirmed: May 2013
Product Number: H03021 | Price: $120.00

Chapter 3.2 *
Standard Practice for Gauging Petroleum and Petroleum Products in Tank Cars—Spanish

Spanish translation of Ch. 3.2.

1st Edition | August 1995 | Reaffirmed: May 2013
Product Number: H03021S | Price: $120.00

Chapter 3.3
Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Pressurized Storage Tanks by Automatic Tank Gauging

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

1st Edition | June 1996 | Reaffirmed: December 2022
Product Number: H03031 | Price: $103.00

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 | Reaffirmed: December 2022
Product Number: H030316 | Price: $103.00

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: August 2021
Product Number: H03041 | Price: $103.00

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 | Reaffirmed: August 2021
Product Number: H03041SP | Price: $103.00

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

1st Edition | March 1997 | Reaffirmed: February 2013
Product Number: H03051 | Price: $90.00

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 | Reaffirmed: February 2013
Product Number: H03051S | Price: $90.00

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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

1st Edition | February 2001 | Reaffirmed: December 2022
Product Number: H03061 | Price: $119.00

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: $102.00

Chapter 4.1 *
Introduction—Spanish

Spanish translation of Ch. 4.1.

3rd Edition | February 2005 | Reaffirmed: June 2014
Product Number: H40101S | Price: $102.00

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

3rd Edition | September 2003 | Reaffirmed: December 2022
Product Number: H04023 | Price: $153.00

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

Russian translation of Chapter 4.2.

3rd Edition | September 2003 | Reaffirmed: December 2022
Product Number: H04023R | Price: $153.00

Chapter 4.4
Tank Provers

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

2nd Edition | May 1998 | Reaffirmed: December 2020
Product Number: H04042 | Price: $103.00

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

4th Edition | June 2016 | Product Number: H40504 | Price: $100.00

Chapter 4.6
Pulse Interpolation

Describes how the double-chronometry method of pulse interpolation, including system operating requirements and equipment testing, is applied to meter proving. Pages: 25

3rd Edition | October 2021 | Product Number: H04063 | Price: $126.00

Chapter 4.7
Field Standard Test Measures

Details the essential elements of field standard test measures by providing descriptions, construction requirements, as well as inspection, handling, and calibration methods. Bottom-neck scale test measures and prover tanks are not addressed in this document. The scope of this standard is limited to the certification of "delivered volumes" of test measures. Pages: 19

3rd Edition | April 2009 | Reaffirmed: June 2014
Product Number: H40703 | Price: $108.00

Chapter 4.8
Operation of Proving Systems

Provides information for operating meter provers on single-phase liquid hydrocarbons. It is intended for use as a reference manual for operating proving systems. The requirements of this chapter are based on customary practices for single-phase liquids. This standard is primarily written for hydrocarbons, but much of the information in this chapter may be applicable to other liquids. Specific requirements for other liquids should be agreeable to the parties involved. Pages: 47

3rd Edition | July 2021 | Product Number: H04083 | Price: $173.00

Chapter 4.9.1
Methods of Calibration for Displacement and Volumetric Tank Provers, Part 1—Introduction to the Determination of the Volume of Displacement and Tank Provers

Covers all the procedures required to determine the field data necessary to calculate a base prover volume (BPV) of either displacement provers or volumetric tank provers. It will enable the user to perform all the activities necessary to prepare the prover, conduct calibration runs, and record all the required data necessary to calculate the base volumes of displacement and tank provers. Evaluation of the results and troubleshooting of many calibration problems are also discussed. This component, Ch. 4.9.1, is the introduction and contains all those relevant aspects that are general in nature, yet essential and applicable to all the different methods of calibration. Therefore, each subsequent part, which describes a specific method of prover calibration, shall be used with Part 1. Together, the two parts contain all the information that is essential to complete the required method of calibration. Pages: 35

2nd Edition | April 2022 | Product Number: H409012 | Price: $146.00

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Chapter 4.9.2
Methods of Calibration for Displacement and Volumetric Tank Provers, Part 2—Determination of the Volume of Displacement and Tank Provers by the Waterdraw Method of Calibration

All prover volumes used to calibrate meters shall be determined by calibration and not by theoretical calculation. Volumetric provers have an exact reference volume, which has been determined by a recognized method of calibration. Techniques for the determination of this reference volume include the waterdraw, master meter, and gravimetric methods of calibration. This standard describes only the waterdraw method of calibration, which is used to accurately determine the calibrated volume of both displacement and tank provers. Pages: 92

1st Edition | December 2005 | Reaffirmed: May 2015
Product Number: H409021 | Price: $226.00

Chapter 4.9.2 *
Methods of Calibration for Displacement and Volumetric Tank Provers, Part 2—Determination of the Volume of Displacement and Tank Provers by the Waterdraw Method of Calibration—Spanish

Spanish translation of Ch. 4.9.2.

1st Edition | December 2005 | Reaffirmed: May 2015
Product Number: H4.9.201S | Price: $226.00

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: $92.00

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—Spanish

Spanish translation of Ch. 4.9.3.

1st Edition | April 2010 | Reaffirmed: March 2015
Product Number: H409031 | Price: $92.00

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
(includes Errata 1 dated August 2016)

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 issues of traceability are addressed by references to National Institute of Standards and Technology (NIST). However, other appropriate national metrology institutes can be referenced. There is no intent to cover safety aspects of conducting the work described in this standard, and it is the duty of the user to be familiar with all applicable safe work practices. It is also the duty of the user to comply with all existing federal, state, or local regulations [e.g. the Occupational Safety and Health Administration (OSHA)] that govern the types of activities described in this standard, and to be familiar with all such safety and health regulations. Pages: 38

1st Edition | October 2010 | Reaffirmed: September 2021
Product Number: H4090401 | Price: $103.00

Chapter 5
Metering

Covers the dynamic measurement of liquid hydrocarbons, by means of meters and accessory equipment.

Chapter 5.1
General Considerations for Measurement by Meters
(includes Errata 1 dated June 2008 and Errata 2 dated June 2011)

Intended to be a guide for the proper specification, installation, and operation of meter runs designed to dynamically measure liquid hydrocarbons so that acceptable accuracy, service life, safety, reliability, and quality control can be achieved. Ch. 5 also includes information that will assist in troubleshooting and improving the performance of meters. Pages: 8

4th Edition | September 2005 | Reaffirmed: December 2022
Product Number: H05014 | Price: $117.00

Chapter 5.1 *
General Considerations for Measurement by Meters—Russian
(includes Errata 1 dated June 2008 and Errata 2 dated June 2011)

Russian translation of Ch. 5.1.

4th Edition | September 2005 | Reaffirmed: December 2022
Product Number: H05014R | Price: $117.00

Chapter 5.1 *
General Considerations for Measurement by Meters—Spanish
(includes Errata 1 dated June 2008 and Errata 2 dated June 2011)

Spanish translation of Ch. 5.1.

4th Edition | September 2005 | Reaffirmed: December 2022
Product Number: H05014SP | Price: $117.00

Chapter 5.2
Measurement of Liquid Hydrocarbons by Displacement Meters

Ch. 5.2, together with the general considerations for measurement by meters found in Ch. 5.1, describes methods for obtaining accurate quantity measurement with displacement meters in liquid hydrocarbon service. It covers the unique performance characteristics of displacement meters in liquid hydrocarbon service. It does not apply to the measurement of two-phase fluids. Pages: 3

3rd Edition | October 2005 | Reaffirmed: December 2020
Product Number: H05023 | Price: $109.00

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

Russian translation of Ch. 5.2.

3rd Edition | October 2005 | Reaffirmed: December 2020
Product Number: H50203R | Price: $109.00

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

Spanish translation of Ch. 5.2.

33rd Edition | October 2005 | Reaffirmed: December 2020
Product Number: H50203SP | Price: $109.00

Chapter 5.3
Measurement of Liquid Hydrocarbons by Turbine Meters
(includes Addendum 1 dated July 2009)

Defines the application criteria for turbine meters and discusses appropriate considerations regarding the liquids to be measured. Discusses the installation of a turbine metering system and the performance, operation, and maintenance of turbine meters in liquid hydrocarbon service. Includes "Selecting a Meter and Accessory Equipment" and information on the recommended location for prover connections. Pages: 11

5th Edition | September 2005 | Reaffirmed: August 2014
Product Number: H05035 | Price: $131.00

Chapter 5.3 *
Measurement of Liquid Hydrocarbons by Turbine Meters—Russian
(includes Addendum 1 dated July 2009)

Russian translation of Ch. 5.3.

5th Edition | September 2005 | Reaffirmed: August 2014
Product Number: H50305R | Price: $131.00

Chapter 5.3 *
Measurement of Liquid Hydrocarbons by Turbine Meters—Spanish
(includes Addendum 1 dated July 2009)

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

5th Edition | September 2005 | Reaffirmed: August 2014
Product Number: H50305SP | Price: $131.00

Chapter 5.4
Accessory Equipment for Liquid Meters
(includes Errata 1 dated May 2015)

Describes the characteristics of accessory equipment used with displacement and turbine meters in liquid hydrocarbon service. Includes guidance on the use of electronic flow computers. Pages: 8

4th Edition | September 2005 | Reaffirmed: August 2015
Product Number: H05044 | Price: $117.00

Chapter 5.4 *
Accessory Equipment for Liquid Meters—Russian
(includes Errata 1 dated May 2015)

Russian translation of Ch. 5.4.

4th Edition | September 2005 | Reaffirmed: August 2015
Product Number:H05044R | Price: $117.00

Chapter 5.4 *
Accessory Equipment for Liquid Meters—Spanish
(includes Errata 1 dated May 2015)

Spanish translation of Ch. 5.4.

4th Edition | September 2005 | Reaffirmed: August 2015
Product Number:H05044SP | Price: $117.00

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

Serves as a guide for the selection, operation, and maintenance of various types of pulsed-data, cabled transmission systems for fluid metering systems to provide the desired level of fidelity and security of transmitted flow pulse data. This publication does not endorse or advocate the preferential use of any specific type of equipment or systems, nor is it intended to restrict future development of such equipment. Pages: 8

2nd Edition | July 2005 | Reaffirmed: August 2015
Product Number: H50502 | Price: $87.00

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

Spanish translation of Ch. 5.5.

2nd Edition | July 2005 | Reaffirmed: August 2015
Product Number: H50502SP | Price: $87.00

Chapter 5.6
Measurement of Liquid Hydrocarbons by Coriolis Meters

Provides guidance for the specification, installation, verification, and operation of Coriolis meters used to dynamically measure liquid hydrocarbons. The document also includes information that will assist in troubleshooting and improving the performance of the meters. Pages: 65

2nd Edition | December 2021
Product Number: H05062 | Price: $288.00

Chapter 5.8
Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters
(includes Errata 1 dated February 2014)
(ANSI/API *MPMS* Ch. 5.8-2011)

Defines the application criteria for ultrasonic flowmeters (UFMs) and addresses the appropriate considerations regarding the liquids to be measured. This document addresses the installation, operation, and maintenance of UFMs in liquid hydrocarbon service. The field of application of this standard is the dynamic measurement of liquid hydrocarbons. While this document is specifically written for custody transfer measurement, other acceptable applications may include allocation measurement, check meter measurement, and leak detection measurement. This document only pertains to spool type, multi-path ultrasonic flow meters with permanently affixed acoustic transducer assemblies. Pages: 23

2nd Edition | November 2011 | Reaffirmed: May 2017
Product Number: H050802 | Price: $108.00

Chapter 5.8 *
Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters—Russian
(ANSI/API *MPMS* Ch. 5.8-2011)

Russian translation of Ch. 5.8.

2nd Edition | November 2011 | Reaffirmed: May 2017
Product Number: H050802R | Price: $108.00

Chapter 5.8 *
Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters—Spanish
(ANSI/API *MPMS* Ch. 5.8-2011)

Spanish translation of Ch. 5.8.

2nd Edition | November 2011 | Reaffirmed: May 2017
Product Number: H050802SP | Price: $108.00

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Chapter 6
Metering Assemblies

Discussion of the design, installation, and operation of metering systems for coping with special situations in hydrocarbon measurement.

Chapter 6.1A
Metering Assemblies—General Considerations

Part of a set of documents that detail the design, installation, calibration, and operation of a liquid flow metering system comprised of equipment used for the custody transfer of liquid hydrocarbons; Ch. 6.1A is common to all sections of API *MPMS* Ch. 6 and specifies the common requirements for system criteria. Pages: 27

1st Edition | July 2021 | Product Number: H061A1 | Price: $126.00

Chapter 6.2
Loading Rack Metering Systems

Serves as a guide in the selection, installation, and operation of loading rack metering systems for petroleum products, including liquefied petroleum gas. This standard does not endorse or advocate the preferential use of any specific type of metering system or meter. Pages: 30

3rd Edition | February 2004 | Reaffirmed: July 2016
Product Number: H60203 | Price: $99.00

Chapter 6.2 *
Loading Rack Metering Systems—Spanish

Spanish translation of Ch. 6.2.

3rd Edition | February 2004 | Reaffirmed: July 2016
Product Number: H60203S | Price: $99.00

Chapter 6.2A
Metering Assemblies—Truck and Rail Loading and Unloading Measurement Systems

Part of a set of documents that detail the minimum requirements for the design, selection, and operation of truck and rail loading and unloading metering systems for single phase liquid hydrocarbons. Pages: 45

1st Edition | July 2021 | Product Number: H062A1 | Price: $149.00

Chapter 6.3A
Metering Assemblies—Pipeline and Marine Loading/Unloading Measurement Systems

Part of a set of documents that detail the minimum requirements for metering systems in single phase liquid applications. This standard (Ch. 6.3A) serves as a guide in the selection, installation, and operation of pipeline and marine loading and unloading, floating production, storage, and offloading (FPSO), and floating storage and offloading (FSO) metering systems. Pages: 33

1st Edition | July 2021 | Product Number: H063A1 | Price: $138.00

Chapter 6.4A
Lease Automatic Custody Transfer (LACT) Systems
(supersedes Ch. 6.1 and Ch. 6.7)

Part of a set of documents that details the minimum requirements for metering systems in single-phase liquid applications. This standard details the specific requirements for the design, selection, and operation of lease automatic custody transfer (LACT) metering systems. Pages: 30

1st Edition | December 2023 | Product Number: H6.4A01 | Price: $107.00

Chapter 6.5
Metering Systems for Loading and Unloading Marine Bulk Carriers

Deals with the operation and special arrangements of meters, provers, manifolding, instrumentation, and accessory equipment used for measurement during loading and unloading of marine bulk carriers. Pages: 6

2nd Edition | May 1991 | Reaffirmed: March 2018
Product Number: H30125 | Price: $81.00

Chapter 6.6
Pipeline Metering Systems

Provides guidelines for selection of the type and size of meters to be used to measure pipeline oil movements, as well as the relative advantages and disadvantages of the methods of proving meters by tank prover, conventional pipe prover, small volume prover, and master meter. It also includes discussion on obtaining the best operating results from a pipeline-meter station. Pages: 9

2nd Edition | May 1991 | Reaffirmed: December 2017
Product Number: H30126 | Price: $81.00

Chapter 7.1 ■
Liquid-in-Glass Thermometers

Describes the methods, equipment, and procedures for manually determining the temperature of liquid petroleum and petroleum products with liquid-in-glass thermometers. This chapter discusses temperature measurement requirements in general for custody transfer, inventory control, and marine measurements. The actual method and equipment selected for temperature determination are left to the agreement of the parties involved. The manual method covers non-pressurized tanks and non-pressurized marine vessels, and gas-blanketed tanks and gas-blanketed marine vessels.Pages: 47

3rd Edition | October 2024 | Product Number: H7.103 | Price: $127.00

Chapter 7.2
Portable Electronic Thermometers
(includes Errata 1 dated January 2021 and Errata 2 dated June 2023)

Describes the methods, equipment, and procedures for manually determining the temperature of liquid petroleum and petroleum products by use of a portable electronic thermometer (PET).

This chapter discusses temperature measurement requirements in general for custody transfer, inventory control, and marine measurements. The actual method and equipment selected for temperature determination are left to the agreement of the parties involved.

The manual method covers:

- nonpressurized tanks and nonpressurized marine vessels;
- gas-blanketed tanks and gas-blanketed marine vessels.

It does not cover hydrocarbons under pressures in excess of 21 kPa (3 psi gauge) or cryogenic temperature measurement, unless the tank is equipped with a thermowell. Pages: 30

3rd Edition | May 2018 | Product Number: H70203 | Price: $137.00

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Chapter 7.3
Fixed Automatic Tank Temperature Systems

Describes the methods, equipment, and procedures for determining the temperature of petroleum and petroleum products under static conditions by the use of an automatic method. Automatic temperature measurement is discussed for custody transfer and inventory control for both onshore and marine measurement applications.

Temperatures of hydrocarbon liquids under static conditions can be determined by measuring the temperature of the liquid at specific locations. Examples of where static temperature determination is required include storage tanks, ships, and barges.

The application of this standard is restricted to automatic methods for the determination of temperature using fixed automatic tank thermometer (ATT) systems for hydrocarbons having a Reid vapor pressure at or below 101.325 kPa (14.696 psia).

Although not included in the scope, requirements in this standard can be used for other fluids and other applications including petroleum liquids having Reid vapor pressures in excess of 101.325 kPa (14.696 psia) tanks with inert gas systems and cryogenic liquids. However, such applications can require different performance and installation specifications. Pages: 27

2nd Edition | October 2011 | Reaffirmed: September 2021
Product Number: H70302 | Price: $103.00

Chapter 7.3 *
Fixed Automatic Tank Temperature Systems—Spanish

Spanish translation of Ch. 7.3.

2nd Edition | October 2011 | Reaffirmed: September 2021
Product Number: H70302SP | Price: $103.00

Chapter 7.4
Dynamic Temperature Measurement

Describes methods, equipment, installation, and operating procedures for the proper determination of the temperature of hydrocarbon liquids under dynamic conditions in custody transfer applications. This standard describes the accuracy requirement and the calibration of the temperature measurement equipment.

This standard does not cover dynamic temperature measurement of refrigerated, light hydrocarbon fluids or cryogenic liquids. Pages: 34

2nd Edition | January 2018 | Reaffirmed: March 2024
Product Number: H70402 | Price: $125.00

Chapter 7.5/ISO 8310:2012
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: HH70501 | Price: $118.00

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

Spanish translation of Ch. 7.5.

1st Edition | September 2014
Product Number: HH70501S | Price: $118.00

Chapter 8
Sampling

Covers standardized procedures for sampling petroleum and petroleum products.

Chapter 8.1
Standard Practice for Manual Sampling of Petroleum and Petroleum Products
(ASTM 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 are described. Procedures are also included for the sampling of free water and other heavy components associated with petroleum and petroleum products. This document also addresses the sampling of semi-liquid or solid-state petroleum products and provides additional specific information about sample container selection, preparation, and sample handling. Pages: 57

6th Edition | September 2022 | Product Number: H8.106SP | Price: $98.00

Chapter 8.1 *■
Standard Practice for Manual Sampling of Petroleum and Petroleum Products—Spanish
(ASTM D4057)

Spanish translation of Ch. 8.1.

6th Edition | September 2022
Product Number: H8.106SP | Price: $98.00

Chapter 8.2
Standard Practice for Automatic Sampling of Petroleum and Petroleum Products
(ASTM 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. Pages: 57

6th Edition | September 2022 | Product Number: H8.206 | Price: $98.00

Chapter 8.2 *■
Standard Practice for Automatic Sampling of Petroleum and Petroleum Products—Spanish
(ASTM D4177)

Spanish translation of Ch. 8.2.

6th Edition | September 2022
Product Number: H8.206S | Price: $98.00

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Chapter 8.3
Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products

Covers handling, mixing, and conditioning procedures that are required to ensure that a representative sample of the liquid petroleum or petroleum product is delivered from the primary sample container or container or both into the analytical apparatus or into intermediate containers. Pages: 30

2nd Edition | September 2019 | Product Number: H08032 | Price: $83.00

Chapter 8.3 *
Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products—Russian

Russian translation of Ch. 8.3.

2nd Edition | September 2019
Product Number: H08032R | Price: $83.00

Chapter 8.4 ■
Standard Practice for Sampling and Handling of Fuels for Volatility Measurement
(ASTM D5842)

Covers procedures and equipment for obtaining, mixing, and handling representative samples of volatile fuels for the purpose of testing for compliance with the standards set forth for volatility related measurements applicable to light fuels. Pages: 16

6th Edition | January 2024 | Product Number: H8.406 | Price: $67.00

Chapter 8.5
Standard Practice for Manual Piston Cylinder Sampling of Volatile Crude Oils, Condensates, and Liquid Petroleum Products
(ASTM D8009)

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). Pages: 21

2nd Edition | September 2022 | Product Number: H8.502| Price: $69.00

Chapter 8.6/ISO 8943
Refrigerated Light Hydrocarbon Fluids—Sampling of Liquified Natural Gas—Continuous and Intermittent Methods
(ANSI/API *MPMS* Ch. 8.6-2020)

Specifies methods for the continuous and the intermittent sampling of liquefied natural gas (LNG) while it is being transferred through an LNG transfer line.

This edition of Ch. 8.6 is the modified national adoption of ISO 8943. Pages: 31

1st Edition | May 2020 | Product Number: H08061 | Price: $132.00

Chapter 8.6/ISO 8943 *
Refrigerated Light Hydrocarbon Fluids—Sampling of Liquified Natural Gas—Continuous and Intermittent Methods—Spanish
(ANSI/API *MPMS* Ch. 8.6-2020)

Spanish translation of Ch. 8.6.

1st Edition | May 2020 | Product Number: H8.601S | Price: $132.00

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

3rd Edition | December 2012 | Reaffirmed: May 2017
Product Number: H09013 | Price: $51.00

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). Pages: 13

4th Edition | January 2023 | Product Number: H9.204 | Price: $64.00

Chapter 9.3 ■
Standard Test Method for Density, Relative Density, and API Gravity of Crude Petroleum and Liquid Petroleum Products by Thermohydrometer Method
(ASTM D6822)

Covers the determination, using a glass thermohydrometer and/or a separate (alternative) temperature-measuring device 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 Reid vapor pressures of 101.325 kPa (14.696 psia) 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. Alternative temperature measuring devices shall be either the appropriate liquid-in-glass ASTM thermometers meeting either Specifications E1 or E2251 or digital contact thermometers. Pages: 27

5th Edition | November 2024 | Product Number: H9.305 | Price: $45.00

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Chapter 9.4
Continuous Density Measurement Under Dynamic (Flowing) Conditions
(supersedes Ch. 14.6)

Covers the continuous on-line determination and application of flowing liquid densities for custody transfer. This standard covers liquid and dense phase fluids, including: natural gas liquids, refined products, chemicals, crude oil, and other liquid products commonly encountered in the petroleum industry. This document does not apply to the density measurement of natural gas, LNG, multiphase mixtures, semi-solid liquids such as asphalt, and solids such as coke and slurries. This standard also provides criteria and procedures for designing, installing, operating, and proving continuous on-line density measurement systems for custody transfer. This standard also discusses the different levels and requirements of accuracy for various applications. Pages: 135

1st Edition | January 2018 | Product Number: H09041 | Price: $199.00

Chapter 9.4 *■
Continuous Density Measurement Under Dynamic (Flowing) Conditions—Spanish
(supersedes Ch. 14.6)

Spanish translation of Ch. 9.4.

1st Edition | January 2018
Product Number: H09041SP | Price: $199.00

Chapter 10
Sediment and Water

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

Chapter 10.1
Standard Test Method for Sediment in Crude Oils and Fuel Oils by the Extraction Method
(ANSI/ASTM D473)

covers the determination of sediment in crude oils and fuel oils by extraction with toluene. The precision applies to a range of sediment levels from 0.01 % to 0.40 % mass, although higher levels may be determined. Pages: 13

4th Edition | November 2022 | Product Number: H10.104 | Price: $66.00

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

Covers the determination of water in crude oil by distillation. The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard. Pages: 19

5th Edition | December 2022 | Product Number: H10.205 | Price: $64.00

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, Test Method D4006 (API *MPMS* Ch. 10.2), and sediment by extraction, Test Method D473 (API *MPMS* Ch. 10.1), shall be used. Pages: 21

5th Edition | December 2022 | Product Number: H10.305 | Price: $64.00

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

Describes the field centrifuge method for determining both water and sediment or sediment only in crude oil. This method may not always produce the most accurate results, but it is considered the most practical method for field determination of water and sediment. This method may also be used for field determination of sediment. Pages: 34

5th Edition | August 2020 | Product Number: H100405 | Price: $138.00

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 % by volume in petroleum products, tars, and other bituminous materials by the distillation method. Pages: 6

6th Edition | October 2023 | Product Number: H10.506 | Price: $45.00

Chapter 10.6
Standard Test Method for Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure)
(ASTM D1796)

Describes the laboratory determination of water and sediment in fuel oils in the range from 0 % to 30 % volume by means of the centrifuge procedure. Pages: 15

6th Edition | December 2022 | Product Number: H10.606 | Price: $57.00

Chapter 10.8
Standard Test Method for Sediment in Crude Oil by Membrane Filtration
(ASTM D4807)

Covers the determination of sediment in crude oils by membrane filtration. This test method has been validated for crude oils with sediments up to approximately 0.15 mass %. The accepted unit of measure for this test method is mass %, but an equation to convert to volume % is provided. Pages: 5

2nd Edition | November 2005 | Reaffirmed: March 2015
Product Number: H100802 | Price: $48.00

Chapter 10.9 ■
Standard Test Method for Water in Crude Oils by Coulometric Karl Fischer Titration
(ASTM D4928)

Covers the determination of water with true concentration range from 0.02 % to 5.00 % by mass or volume in crude oils using Procedures A and B and from 0.04 % to 3.75 % by mass or volume for Procedure C. Mercaptan (RSH) and sulfide (S^- or H_2S) as sulfur are known to interfere with this test method, but at levels of less than 500 µg/g [ppm(m)], the interference from these compounds is insignificant. This test method is intended for use with standard commercially available coulometric Karl Fischer reagent. Pages: 17

4th Edition | November 2024 | Product Number: H10.904 | Price: $67.00

*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.

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

Provides guidance for the application, installation, operation, verification, and proving of on-line water devices (OWDs) for use in the non-custody transfer measurement of water in crude oil and condensate. A joint API/ Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM56. Pages: 17

1st Edition | October 2010 | Reaffirmed: January 2016
Product Number: H25701 | Price: $91.00

TR 2573
Standard Guide for Sediment and Water Determination in Crude Oil (ASTM D7829)

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

1st Edition | September 2013 | Reaffirmed: September 2018
Product Number: H257301 | Price: $51.00

Chapter 11
Physical Properties Data (Volume Correction Factors)

Ch. 11 is the physical data that has direct application to volumetric measurement of liquid hydrocarbons. It is presented in 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
Standard Document and API 11.1 VCF Application
Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils (includes Addendum 1 dated September 2007 and Addendum 2 dated May 2019)
(the 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.

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 (RHOobs), base (RHOb), and alternate (RHOtp) 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/m^3, °C, kPag, and Barg) 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 by phone or email. Please contact Quorum Software at +1 (713) 430-8600 or send an e-mail to APIstandards@qbsol.com.

May 2004 | Product Number: H11013 | Reaffirmed: August 2012
2-Year Extension: March 2017

11.1 Standard Document | $260.00 per document
11.1 VCF Application | $568.00 per single user license
11.1 Standard Document + 11.1 VCF Application | $704.00
(15% discount when purchased together)

See the listing for "Chapter 11.1–1980" on page 177 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/m^3), temperature (°F and °C), and pressure (psig, bar, and kPa).

To order, contact Quorum Software at +1 (713) 430-8600 or send an e-mail to APIstandards@qbsol.com.

XL Add-In—runs on a single standalone computer with no network access
Price: $812.00

XL Add-In—installed on less than 15 standalone computers or ran on a network with less than 15 nodes | Price: $5,408.00

XL Add-In—installed on less than 50 standalone computers or ran on a network with less than 50 nodes | Price: $8,111.00

XL Add-In—installed on an unlimited number of standalone computers or ran on a network with unlimited nodes | Price: $11,897.00

Chapter 11.1
Dynamic Link Library (DLL)

The DLL is compiled from source code written in the C programming language. The DLL provides subroutines that can be called from applications written in C or other programming languages. These subroutines are subdivided into three groups (density, volume correction factors, and scaled compressibility factor) for generalized crude oils, refined products, and lubricating oils.

- The density subroutines have two sets of density functions allowing calculations at base conditions or at alternate conditions.
- The volume correction factor subroutines calculate a correction for 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 scaled compressibility factor subroutines will convert from alternate to base conditions or from observed to base conditions.

The DLL supports the following process units, densities in API gravity, relative density, and kg/m^3, temperatures in °F and °C, and pressures in psig, bar, and kPa. This version is compatible with and can coexist with the 1980 version DLL.

To order, contact Quorum Software at +1 (713) 430-8600 or send an e-mail to APIstandards@qbsol.com.

DLL—installed on less than 50 standalone computers or ran on a network with less than 50 nodes | Price: $16,223.00

DLL—installed on an unlimited number of standalone computers or ran on a network with unlimited nodes | Price: $21,630.00

DLL—compiled as part of an application for distribution (software distributor) Price: $32,445.00

To purchase individual API standards, visit apiwebstore.org

Chapter 11.1
Source Code

ANSI C-Code used to compile the dynamic link libraries (DLLs). The source code may be compiled into user programs to calculate temperature and pressure volume correction factors for generalized crude oils, refined products, and lubricating oils.

NOTE An experienced C programmer will be needed to implement the C-Code subroutines. API does not directly provide technical support for the C-Code; however, a support program is available from Flow-Cal, Inc.

To order, contact Quorum Software at +1 (713) 430-8600 or send an e-mail to APIstandards@qbsol.com.

C-Code—compiled to run on a network with less than 50 nodes
Price: $24,334.00

C-Code—compiled to run on a network with unlimited nodes
Price: $32,445.00

C-Code—compiled as part of an application for distribution (software distributor) | Price: $48,668.00

Chapter 11.1
Source Code, DLL & XL Add-In—Combined

To order, contact Quorum Software at +1 (713) 430-8600 or send an e-mail to APIstandards@qbsol.com.

C-Code, DLL, and XL Add-In—compiled to run on a network with less than 50 nodes | Price: $29,741.00

C-Code, DLL, and XL Add-In—compiled to run on a network with unlimited nodes | Price: $40,016.00

C-Code, DLL, and XL Add-In—compiled as part of an application for distribution (software distributor) | Price: $56,650.00

Chapter 11.2
Data File of Chapters 11.2.2 and 11.2.2M

This package includes a data file of tables found in Ch. 11.2.2 and Ch. 11.2.2M. The tables, presented in both U.S. customary (USC) and metric (SI) units, cover compressibility factors for light hydrocarbons.

1st Edition | August 1984 | Product Number: H27320 | Price: $321.00

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

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

2nd Edition | October 1986 | Reaffirmed: September 2017
Product Number: H27307 | Price: $213.00

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

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

1st Edition | October 1986 | Reaffirmed: September 2017
Product Number: H27309 | Price: $213.00

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—Russian

Russian translation of Ch. 11.2.2M.

1st Edition | October 1986 | Reaffirmed: September 2017
Product Number: H27309R | Price: $213.00

Chapter 11.2.4
Temperature Correction for the Volume of NGL and LPG Tables 23E, 24E, 53E, 54E, 59E, 60E
(GPA 8217)

Consists of the implementation procedures for the correction of temperature effects on density and volume of natural gas liquids and liquified petroleum gas. Sample tables, flow charts, and specific examples created from a computerized version of these implementation procedures are included. The examples provide guidance and checkpoints for those who wish to implement a computerized procedure to represent the standard, however these are not part of the actual standard.

This standard covers a 60 °F relative density range of 0.3500 to 0.6880, which nominally equates to a density at 15 °C of 351.7 kg/m^3 to 687.8 kg/m^3 and a density at 20 °C of 331.7 kg/m^3 to 683.6 kg/m^3. The temperature range of this standard is –50.8 °F to 199.4 °F (–46 °C to 93 °C). At all conditions, the pressure is assumed to be at saturation conditions (also known as bubble point or saturation vapor pressure). Pages: 155

2nd Edition | June 2019 | Product Number: H1102042 | Price: $247.00

Chapter 11.2.4 *
Temperature Correction for the Volume of NGL and LPG Tables 23E, 24E, 53E, 54E, 59E, 60E—Russian
(GPA 8217)

Russian translation of Ch. 11.2.4.

2nd Edition | June 2019 | Product Number: H1102042R | Price: $247.00

Chapter 11.2.4 *■
Temperature Correction for the Volume of NGL and LPG Tables 23E, 24E, 53E, 54E, 59E, 60E—Spanish
(GPA 8217)

Spanish translation of Ch. 11.2.4.

2nd Edition | June 2019 | Product Number: H1102042SP | Price: $247.00

Chapter 11.2.5
A Simplified Vapor Pressure Correlation for Commercial NGLs
(includes Errata 1 dated October 2023)

This revised standard is effective upon the date of publication and supersedes all previous revisions of the standard, including API *MPMS* 11.2.2A/GPA TP-15. Two methods used for calculation of the correction factor for pressure effects (Fp) were standardized by API: *MPMS* Chapter 11.2.1-1984 (now superseded by Chapter 11.1-2004 and *MPMS* Chapter 11.2.2-1986. These methods require a knowledge of the equilibrium bubble point pressure (vapor pressure) at the measured conditions. However, the vapor pressure of the process liquid is generally not measured. The vapor pressure can also be calculated from compositional information, but the composition is not always measured for natural gas liquids (NGLs). This document provides a simplified correlation for the vapor pressure of NGLs based upon normally measured. Pages: 32

2nd Edition | December 2020 | Product Number: H1102052 | Price: $126.00

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Chapter 11.3.2.1
Ethylene Density

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

2nd Edition | May 2013 | Product Number: H1132102 | Price: $76.00

Chapter 11.3.3
Miscellaneous Hydrocarbon Product Properties—Denatured Ethanol Density and Volume Correction Factors

Covers density and volume correction factors for denatured fuel ethanol. Annex E of the Third Edition presents a method to determine the compressibility factor for ethanol. The actual standard consists of the explicit implementation procedures set forth in this document. Sample tables and other examples created from a computerized version of this implementation procedure are presented as examples only, and do not represent the standard.

This standard is applicable at any 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. Annex E extends the range of application to –40 to 60 °C (–40 to 140 °F) over the pressure range of 0 to 15 MPa (0 to 2200 psi). Pages: 29

3rd Edition | May 2019 | Reaffirmed: October 2024
Product Number: H1103033 | Price: $193.00

Chapter 11.3.3 *
Miscellaneous Hydrocarbon Product Properties—Denatured Ethanol Density and Volume Correction Factors—Spanish

Spanish translation of Ch. 11.3.3.

3rd Edition | May 2019 | Reaffirmed: October 2024
Product Number: H1103033S | Price: $193.00

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: October 2017
Product Number: H25656 | Price: $353.00

Chapter 11.3.4
Miscellaneous Hydrocarbon Product Properties—Denatured Ethanol and Gasoline Component Blend Densities and Volume Correction Factors

Covers density and volume correction factors for blends of denatured ethanol and gasoline blend components ranging from 0 % to 95 % denatured ethanol based upon calculation methods defined in API *MPMS* Chapter 11.1 and Chapter 11.3.3. Calculation of blends and denatured ethanol containing more than 95 % ethanol should use the calculation procedures within API *MPMS* Chapter 11.3.3.

The standard consists of correlations and algorithms for estimating the blend volume change at base conditions and for calculating volume correction factors of denatured ethanol and gasoline component blends. This standard also provides the algorithms to estimate certain blend properties in blending situations where some of the required parameters are not measured.

This standard is applicable to blends containing denatured ethanol and gasoline blend components with 15.5 °C (60 °F) densities ranging from 680 to 800 kg/m^3 (45.2 to 76.4 °API) containing between 0 % and 95 % by volume denatured ethanol over the temperature range of –40 °C to 50 °C (–40 °F to 122 °F) and pressure range of 0 to 10.34 MPa gage (0 to 1508 psig). Pages: 60

1st Edition | May 2019 | Product Number: H11030401 | Price: $217.00

Chapter 11.3.4 *■
Miscellaneous Hydrocarbon Product Properties—Denatured Ethanol and Gasoline Component Blend Densities and Volume Correction Factors—Spanish

Spanish translation of Ch. 11.3.4.

1st Edition | May 2019 | Product Number: H11030401S | Price: $217.00

TR 2580
Documentation Report and Data Files for: API *MPMS* Chapter 11.3.3 and API *MPMS* Chapter 11.3.4

Assembles and makes available the various foundational data and materials used in the development of API *MPMS* Chapter 11.3.3 and API *MPMS* Chapter 11.3.4. It includes the historical reports and spreadsheets used as is, without update or reconciliation for any later changes. This document does not extend, modify, or otherwise change anything in the standards as published by API.

Users should not attempt to develop their own implementations of the standard calculations from this document.

The user is directed to the published implementations in the standards. This document contains only the background materials, not the standards, nor any computer implementation of the standards. Only the final versions of materials have been included. Some graphs within the spreadsheets may not appear the same as in published documents because the authors may have changed settings or data filters in the spreadsheets subsequent to copying the graphs for publication.

Annex A through Annex G materials are available in files for download from API Publications for purchasers of this document. Annex H is included in this document. Pages: 33

1st Edition | May 2019 | Product Number: H258001 | Price: $265.00

Chapter 11.4.1
Properties of Reference Materials, Part 1—Density of Water and Water Volumetric Correction Factors for Water Calibration of Volumetric Provers

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: 25

2nd Edition | July 2018 | Reaffirmed: August 2023
Product Number: H11412 | Price: $93.00

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Chapter 11.4.1 *
Properties of Reference Materials, Part 1—Density of Water and Water Volumetric Correction Factors for Water Calibration of Volumetric Provers—Spanish

Spanish translation of Ch. 11.4.1.

2nd Edition | July 2018 | Reaffirmed: August 2023
Product Number: H11412S | Price: $93.00

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: $268.00

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

While not related to relative density, the following are included for user convenience:

- U.S. gallons at 60 °F to litres at 15 °C (old Table 22);
- barrels at 60 °F to litres at 15 °C (old Table 22, Table 52).

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 pound at 60 °F in vacuo and in air;
- short tons per 1000 litres (cubic metres) at 15 °C in vacuo and in air (old Table 57);
- short tons per 1000 U.S. gallons at 60 °F in vacuo and in air;
- U.S. gallons per short ton at 60 °F in vacuo and in air;
- short tons per barrel at 60 °F in vacuo and in air;
- barrels per short ton at 60 °F in vacuo and in air;
- long tons per 1000 litres (cubic metres) at 15 °C in vacuo and in air (old Table 57);

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- U.S. gallons per metric ton at 60 °F in vacuo and in air (old Table 58);
- barrels per metric ton at 60 °F in vacuo and in air (old Table 58);
- long tons per 1000 U.S. gallons at 60 °F in vacuo and in air;
- U.S. gallons per long ton at 60 °F in vacuo and in air;
- long tons per barrel at 60 °F in vacuo and in air;
- barrels per long ton at 60 °F in vacuo and in air.

While not related to relative density, the following are included for user convenience:

- litres at 15 °C to U.S. gallons at 60 °F;
- cubic metres at 15 °C to barrels at 60 °F (old Table 52).

Chapter 12
Calculation of Petroleum Quantities

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

Chapter 12.1.1
Calculation of Static Petroleum Quantities, Part 1—Upright Cylindrical Tanks and Marine Vessels

Guides the user through the steps necessary to calculate static liquid quantities, at atmospheric conditions, in upright cylindrical tanks and marine tank vessels. It defines terms employed in the calculation of static petroleum quantities.

This document 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. Pages: 52

4th Edition | February 2019 | Reaffirmed: October 2024
Product Number: H1201014 | Price: $151.00

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.

4th Edition | February 2019 | Product Number: H1201014 | Price: $151.00

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

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: 62

2nd Edition | February 2018 | Product Number: H12122 | Price: $152.00

Chapter 12.2
Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors
(supersedes Ch. 12.2.1, Ch. 12.2.2, and Ch. 12.2.3)

Presents the calculation procedures for dynamic measurement tickets (meter tickets), and meter proving of devices with volumetric outputs. This document 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 criteria contained in this document allow different entities using various computer languages on different computer hardware (or manual calculations) to arrive at output results within a defined tolerance as specified within this document, using the same input data. 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: 69

2nd Edition | July 2021 | Product Number: H12202 | Price: $229.00

Chapter 12.2.5
Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 5—Base Prover Volume Using Master Meter Method
(includes Ch. 12 Addendum 1 dated August 2007 and Errata 1 dated July 2009)

Provides standardized calculation methods for the quantification of liquids and the determination of base prover volumes under defined conditions, regardless of the point of origin or destination or units of measure required by governmental customs or statute. The criteria contained in this document allow different entities using various computer languages on different computer hardware (or manual calculations) to arrive at identical results using the same standardized input data. Pages: 108

1st Edition | September 2001 | Reaffirmed: August 2016
Product Number: H12025 | Price: $212.00

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

1st Edition | July 1996 | Reaffirmed: July 2022
Product Number: H12031 | Price: $112.00

Chapter 12.4.1
Calculation of Petroleum Quantities—Base Prover Volume Determination—Waterdraw Volumetric Method
(supersedes Ch. 12.2.4)

Provides standardized calculation methods for the quantification of liquids and the determination of base prover volumes (BPVs) under defined conditions by waterdraw method, regardless of the point of origin or destination or units of measure required by governmental organizations. The criteria contained in this document allows different individuals, using various computer languages on different computer hardware (or manual calculations), to arrive at identical results using the same standardized input data. Pages: 97

1st Edition | September 2023
Product Number: H124101 | Price: $206.00

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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 13.2
Methods of Evaluating Meter Proving Data

Establishes the basic concepts and procedures to estimate and report meter performance uncertainty in consistent and comparable ways. Pages: 40

2nd Edition | April 2018 | Product Number: H13022 | Price: $117.00

Chapter 13.2 *■
Methods of Evaluating Meter Proving Data—Spanish

Spanish translation of Ch. 13.2.

2nd Edition | April 2018 | Product Number: H13022SP | Price: $117.00

Ch. 13.3
Measurement Uncertainty

Establishes a methodology to develop uncertainty analyses for use in writing API *Manual of Petroleum Measurement Standards* (*MPMS*) documents that are consistent with the ISO GUM and NIST Technical Note 1297. This standard also supersedes Ch. 13.1, 1st Edition, 1985, which is withdrawn. Pages: 75

2nd Edition | December 2017 | Reaffirmed: December 2022
Product Number: H130302 | Price: $141.00

Chapter 13.3 *
Measurement Uncertainty—Spanish

Spanish translation of Ch. 13.3.

2nd Edition | December 2017 | Reaffirmed: December 2022
Product Number: H130302S | Price: $141.00

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 (GPA 2166)

Provides comprehensive guidelines and procedures for properly extracting, collecting, conditioning, and handling a sample from a flowing natural gas stream at or above its dew point temperature and that represents the composition of the vapor-phase portion of the source fluid. This standard considers spot, composite, continuous, online, and mobile sampling systems and does not include sampling of liquid or multiphase streams. Pages: 110

8th Edition | September 2022
Product Number: H14.108 | Price: $338.00

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 (ANSI/API *MPMS* Ch. 14.3.1-2012) (AGA Report No. 3, Part 1) (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

4th Edition | September 2012 | Reaffirmed: September 2017
Product Number: H1403014 | Price: $225.00

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) (includes Errata 1 dated March 2017 and Errata 2 dated January 2019)

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 | Reaffirmed: August 2024
Product Number: H1403025 | Price: $233.00

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

4th Edition | June 2021
Product Number: H1403034 | Price: $274.00

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Chapter 14.3.4
Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids—Concentric, Square-edged Orifice Meters Part 4—Background, Development, Implementation Procedure, and Example Calculations
(AGA Report No. 3, 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: 112

4th Edition | October 2019 | Product Number: H1403044 | Price: $225.00

Chapter 14.4
Converting Mass of Natural Gas Liquids and Vapors to Equivalent Liquid Volumes
(GPA 8173-17)

Prescribes a method for calculating liquid volumes at equilibrium pressures and at temperatures of 60 °F, 15 °C, and 20 °C from the mass of a natural gas fluid (liquid or vapor) measured at operating conditions, in conjunction with a representative compositional analysis and published values for each component's molar mass and absolute density. Pages: 24

2nd Edition | June 2017 | Product Number: H140402 | Price: $81.00

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

3rd Edition | January 2009 | Reaffirmed: November 2020
Product Number: H140503 | Price: $91.00

Chapter 14.7
Mass Measurement of Natural Gas Liquids and Other Hydrocarbons
(GPA 8182-18)

Serves as a reference for the selection, design, installation, operation, and maintenance of single-phase dynamic liquid mass measurement systems that operate in the 350 to 688 kg/m^3 (0.350 to 0.689 relative density at 60 °F) density range. The mass measurement systems within the scope of this document include inferred mass measurement, where volume at flowing conditions is combined with density at similar conditions to result in measured mass, as well as Coriolis mass measurement. Liquids with density below 350 and above 688 kg/m^3 (below 0.350 and above 0.689 relative density at 60 °F) and cryogenic fluids (colder than approximately –50 °F) are excluded from the scope of this document, but the principles described herein may apply to such streams. Sampling equipment and techniques are covered including standards for analytical methods used to determine the composition of the sampled product. Equations of state and correlations used to calculate the density of the product are discussed. The standard used to convert mass to equivalent liquid volumes of components is also discussed. Pages: 16

5th Edition | February 2018 | Reaffirmed: July 2023
Product Number: H140705 | Price: $88.00

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: 75

2nd Edition | December 2021
Product Number: H140102 | Price: $155.00

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Chapter 14.12
Measurement of Gas by Vortex Meters

Addresses the following: (a) provides generic information on full-bore vortex shedding flowmeters, including glossary, and sets of engineering equations useful in specifying performance; (b) describes vortex shedding flowmeters in which alternating vortices are shed from one or more bluff bodies installed in a closed conduit; (c) describes how the vortex shedding frequency is used to determine the velocity to infer the volume, mass, and/or energy flow rate and the total gas flow through the meter over a specific time interval; (d) applies only to single phase gas flows in closed conduit that are steady or vary slowly in time. For fiscal measurement, the output of the flow rate shall be within the acceptable limits of steady state flow rate; (e) describes the physical components of vortex shedding flowmeters and identifies need for inspection, certification, and material traceability; (f) addresses the effect of gas properties, installation, and process conditions that may affect the measurement uncertainty and describes guidelines for reducing or eliminating their influences; (g) defines the method for calculating uncertainty of the flow rate measurement; (h) defines the meter output requirements and necessary information pertaining to the meter output for the purpose of fiscal measurement of gas; and (i) provides calibration and/or performance verification guidance for the field application. Pages: 35

1st Edition | March 2017 | Product Number: H140121 | Price: $108.00

Chapter 14.13
Simplified Metering System Design and Performance-Based Methodology for Non-Custody Gas Measurement

Provides guidance in the following areas to allow the user to achieve a targeted uncertainty of measurement: selection of flow meter type: differential pressure, displacement, ultrasonic, Coriolis, vortex, turbine, thermal, and others; associated instrumentation for measuring fluid properties and flowing conditions, such as pressure and temperature transmitters, 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. Pages: 77

1st Edition | October 2022 | Product Number: H14.1301 | Price: $173.00

Chapter 14.14
Venturi Metering of Natural Gas and Other Related Hydrocarbon Fluids

Provides engineering equations, uncertainty estimations, installation requirements, and standardized implementation recommendations for the calculation of flow rate of single-phase fluids, liquid or gas, through concentric differential-pressure-producing Venturi meters. Pages: 27

1st Edition | March 2023 | Product Number: H14.1401 | Price: $113.00

Chapter 15
Guidelines for the Use of Petroleum Industry-Specific International System (SI) Units

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 SI units not covered in ASTM/IEEE SI-10. 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 other, similar process industries. Pages: 44

4th Edition | June 2019 | Reaffirmed: June 2024
Product Number: H15004 | Price: $157.00

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 Cargo 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. The purchase of this document includes Excel® spreadsheets of the Sample Forms in Annex A (excluding "Voyage Analysis Report," which is available in API *MPMS* 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: 55

7th Edition | February 2022 | Product Number: H170107 | Price: $206.00

Chapter 17.1 *
Guidelines for Marine Cargo Inspection—Spanish

Spanish translation of Ch. 17.1.

7th Edition | February 2022 | Product Number: H170107S | Price: $206.00

Chapter 17.2
Measurement of Cargoes On Board Tank Vessels

The determination of the quantity and quality of cargo on board marine tank vessels is frequently complex. It is necessary to accurately gauge, ascertain the temperature of, collect samples of, and calculate the amount of all materials contained in the vessel's lines, cargo tanks, and slop tanks. Other spaces on the vessel may also contain cargo, such as ballast tanks, double bottoms, cofferdams, and numerous other nondesignated cargo spaces, all of which have to be checked, and any volumes contained in them calculated. Measurement accountability (quantity and quality) has to further take into account conditions such as, but not limited to, OBQ/ROB, line fullness, preloading tank inspection, closed measurement and sampling systems, and special procedures for chemical and gas cargoes. Reconciliation of the foregoing may be required if gains or losses exceed expected tolerances. The detailed requirements for performing all of these actions are contained in numerous *MPMS* standards. This publication identifies the methods for performing these procedures on crude oils; petroleum products; chemical cargoes; LPG and LNG, normally carried on board marine tank vessels; and guides the user to the appropriate standard/guidance document within the *MPMS* suite of standards. Pages: 47

3rd Edition | January 2023 | Product Number: H170203 | Price: $176.00

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 | Reaffirmed: July 2021
Product Number: H170302 | Price: $150.00

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

Spanish translation of Ch. 17.3.

2nd Edition | December 2016 | Reaffirmed: July 2021
Product Number: H170302S | Price: $150.00

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 pumpability. Refer to Ch. 3. Pages: 25

2nd Edition | September 2016
Product Number: H170402 | Price: $137.00

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

Spanish translation of Ch. 17.4.

2nd Edition | September 2016
Product Number: H170402S | Price: $137.00

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 a spreadsheet for determining voyage analysis and reconciliation of cargo quantities. Pages: 48

4th Edition | July 2019 | Product Number: H170504 | Price: $193.00

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. While this standard primarily addresses pipelines between vessels and marine terminals, it can also be applied to pipelines involved in shore-to-shore transfers. It includes descriptions of methods and procedures that apply to crude oil and petroleum products. Pages: 18

3rd Edition | September 2022
Product Number: H17.603 | Price: $195.00

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 | Reaffirmed: January 2022
Product Number: H170802 | Price: $134.00

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

Spanish translation of Ch. 17.8.

2nd Edition | August 2016 | Reaffirmed: January 2022
Product Number: H170802S | Price: $134.00

Chapter 17.9
Vessel Experience Factor (VEF)

Provides a recommended practice for the calculation and application of a vessel experience factor (VEF). This standard provides guidelines for data compilation, data maintenance, data validation, and recommendations on the appropriate use of a VEF involving marine vessels.

It also provides instruction for parcel tankers, compartmental VEFs, and vessel-to-vessel transfers. The methods are applicable to liquid bulk cargoes including crude oil, petroleum products, chemicals, and liquid petroleum gases. Pages: 30

3rd Edition | July 2019 | Product Number: H170903 | Price: $224.00

Chapter 17.10.1/ISO 10976:2015
Refrigerated Light Hydrocarbon Fluids—Measurement of Cargoes on Board Marine LNG Carriers
(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, vapor 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: 64

2nd Edition | June 2021 | Product Number: HH171012 | Price: $206.00

Chapter 17.10.2
Measurement of Cargoes On Board Marine Gas Carriers, Part 2—Liquefied Petroleum and Chemical Gases
(includes Errata 1 dated March 2021)

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: $187.00

Chapter 17.11 ■
Measurement and Sampling of Liquid Hydrocarbon Cargoes 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. Pages: 30

3rd Edition | January 2024 | Product Number: H17.1103 | Price: $125.00

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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, HM51. Pages: 66

2nd Edition | August 2015 | Product Number: H170122 | Price: $202.00

Chapter 17.12 *
Procedures for Bulk Liquid Chemical Cargo Inspections—Spanish

Spanish translation of Ch. 17.12.

2nd Edition | August 2015 | Product Number: H170122S | Price: $202.00

Chapter 17.14.1
Measurement of Bulk Cargoes by Draft Survey, Part 1: Ocean-Going Vessels

Describes the procedure for determining the transferred quantity of non-liquid petroleum products loaded onto or discharged from ocean-going vessels by draft survey.

This procedure is not an alternative where effective static or dynamic liquid measurement methods can be used. Pages: 38

1st Edition | October 2019 | Product Number: H1714101 | Price: $193.00

Chapter 17.14.2
Measurement of Bulk Cargoes by Draft Survey, Part 2: Inland Barges

Describes the procedure for determining the transferred quantity of non-liquid petroleum products loaded onto or discharged from inland barges by draft survey.

This procedure is not an alternative where effective static or dynamic liquid measurement methods can be used. Pages: 29

1st Edition | October 2019 | Product Number: H1714201 | Price: $181.00

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 Lease Tanks by Truck

Contains procedures that are organized into a recommended sequence of steps for manually gauging and determining the quantity and quality of crude oil being gathered from lease tanks by truck. These measurements and tests are performed by crude oil truck drivers (COTDs) and other parties who are responsible for the custody transfer and for recording the results of the measurements and tests on the run tickets. These procedures apply to the custody transfer from lease storage tanks to the transporting truck. Pages: 24

3rd Edition | May 2018 | Reaffirmed: September 2023
Product Number: H18013 | Price: $155.00

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 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: $155.00

Chapter 18.2 *
Custody Transfer of Crude Oil from Lease Tanks Using Alternative Measurement Methods—Spanish

Spanish translation of Ch. 18.2.

1st Edition | July 2016 | Product Number: H180201S | Price: $155.00

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.

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Chapter 19.1
Evaporative Loss from Fixed-Roof Tanks
(previously Publ 2518)

Contains methodologies for estimating the total evaporative losses of hydrocarbons from fixed-roof tanks. The methodologies provide loss estimates for general equipment types based on laboratory, test-tank, and field-tank data.

Types of fixed-roof tanks and roof fittings described are for information only. The equations estimate average annual losses from uninsulated fixed-roof tanks for various liquid stocks, stock vapor pressures, tank sizes, meteorological conditions, and operating conditions. The following special cases are addressed.

- Horizontal tanks.
- Higher volatility stocks (true vapor pressure greater than 0.1 psia).
- Vent settings higher than 0.03 pounds (0.5 oz) per square inch.

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 which have an internal floating roof. Ch. 19.2 and TR 2569 address these.
- To estimate losses from fixed-roof tanks which have either roof or shell insulation.
- To estimate losses from cleaning fixed-roof tanks. TR 2568 addresses this. Pages: 38

5th Edition | June 2017 | Reaffirmed: July 2022
Product Number: H190105 | Price: $193.00

Chapter 19.1D
Documentation File for API Manual of Petroleum Measurement Standards Chapter 19.1—Evaporative Loss from Fixed-Roof Tanks
(previously Bulletin 2518)
(includes Errata 1 dated June 1994)

Presents information on the development of theoretical equations; comparisons with test data; a sensitivity analysis of the loss equation; and other pertinent information that was developed during the preparation of Ch. 19.1. Pages: 190

1st Edition | March 1993 | Product Number: H30553 | Price: $185.00

Chapter 19.2
Evaporative Loss from Floating-Roof Tanks
(previously Publ 2517 and Publ 2519)

Contains methodologies for estimating the total evaporative losses of hydrocarbons from external floating-roof tanks (EFRTs), freely vented internal floating-roof tanks (IFRTs), and domed external floating-roof tanks (domed EFRTs). The methodologies provide loss estimates for general equipment types based on laboratory, test-tank, and field-tank data. Types of floating roofs, rim-seal systems, and deck fittings are described for information only.

The equations estimate average annual losses from floating-roof tanks for various types of tank construction, floating-roof construction, rim-seal systems, and deck fittings, as well as for various liquid stocks, stock vapor pressures, tank sizes, and wind speeds (EFRTs).

The equations were developed for:

- stocks with a true vapor pressure greater than approximately 0.1 psia,
- average wind speeds ranging from 0 miles per hour (mph) to 15 mph (EFRTs), and
- tank diameters greater than 20 ft.

The estimation techniques become more approximate when these conditions are not met.

When this standard is used to estimate losses from non-freely vented (closed vent) internal or domed external floating-roof tanks (tanks vented only through a pressure-vacuum relief vent, blanketed with an inert gas, vented to a vapor processing unit, or otherwise restricted from being freely vented), refer to the methodology in TR 2569.

The equations are not intended to be used in the following applications.

- To estimate losses from unstable or boiling stocks (i.e. 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 tanks in which the materials used in the rim seal, deck fittings, or deck seams have either deteriorated or been significantly permeated by the stored stock.
- To estimate losses from storage tanks that do not have a floating roof.
- To estimate losses from landing floating roofs (TR 2567 addresses this).
- To estimate losses from cleaning storage tanks (TR 2568 addresses this).

The 3rd Edition of Ch. 19.4 was published following a revision that was carried out concurrently with revisions to Ch. 19.1, published as the 4th Edition, and Ch. 19.2, published as the 3rd Edition. Primary changes are 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: 110

4th Edition | August 2020 | Product Number: H190204 | Price: $241.00

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Chapter 19.3, Part A
Wind Tunnel Test Method for the Measurement of Deck-Fitting Loss Factors for External Floating-Roof Tanks

Describes the procedures to establish evaporative loss factors for deck fittings on external floating-roof tanks. The test method involves measuring the weight loss of a test assembly over time. The standard specifies the test apparatus, instruments, test procedures, and calculation procedures to be used. It also addresses the variables to be measured, format for reporting the test values, and their associated uncertainty. Pages: 27

1st Edition | June 1997 | Reaffirmed: February 2023
Product Number: H1903A | Price: $133.00

Chapter 19.3, Part B
Air Concentration Test Method—Rim-Seal Loss Factors for Floating-Roof Tanks

Describes the procedures to establish evaporative rim-seal loss factors for rim seals used on external floating-roof tanks. The test method involves passing a controlled flow rate of air through a test chamber that contains a test liquid and a test rim seal, and measuring the concentration of the test liquid vapor in the air streams entering and leaving the test chamber. The standard specifies the test apparatus, instruments, test procedures, and calculation procedures to be used. It also addresses the variables to be measured, format for reporting the test values, and their associated uncertainty. Pages: 30

1st Edition | August 1997 | Reaffirmed: February 2023
Product Number: H1903B | Price: $133.00

Chapter 19.3, Part C
Weight Loss Test Method for the Measurement of Rim-Seal Loss Factors for Internal Floating-Roof Tanks

Provides a uniform method for measuring evaporative loss from rim seals used on aboveground storage tanks. This information can be utilized to establish product specific loss factors in terms of loss rate and seal gap area. Pages: 29

1st Edition | July 1998 | Reaffirmed: May 2023
Product Number: H1903C | Price: $133.00

Chapter 19.3, Part D
Fugitive Emission Test Method for the Measurement of Deck-Seam Loss Factors for Internal Floating-Roof Tanks

Establishes a uniform method for measuring evaporative deck-seam loss factors and deck-joint loss factors of mechanically joined deck seams that are used on internal floating-roof tanks. These deck-seam loss factors and deck-joint loss factors are to be determined in terms of their loss rate at specified pressure differences across the deck seam or deck joint for certification purposes. Pages: 31

1st Edition | June 2001 | Reaffirmed: July 2023
Product Number: H1903D | Price: $133.00

Chapter 19.3, Part E
Weight Loss Test Method for the Measurement of Deck-Fitting Loss Factors for Internal Floating-Roof Tanks

Describes the test methods to be used to establish evaporative loss factors for deck fittings on internal floating-roof tanks. This chapter specifies the test apparatus, instruments, test procedures, and calculation procedures to be used. The standard also addresses the requirements for reporting test report values. Pages: 30

1st Edition | May 1997 | Reaffirmed: February 2023
Product Number: H1903E | Price: $133.00

Chapter 19.3, Part H
Specification for Establishing Evaporative Loss Factors for Floating-Roof Tank Devices

Illustrates how other standards of the API *MPMS* Ch. 19.3 series are integrated into an overall loss factor development program to enable the user to develop a loss factor for a given floating-roof device. This standard presents procedures for the evaluations to be performed under such a program, including preparation for protocol testing of individual devices, monitoring of the tests, and analysis and reporting of test results for the purposes of establishing evaporative loss factors. Pages: 69

2nd Edition | April 2022 | Product Number: H1903H02 | Price: $167.00

Chapter 19.4
Evaporative Loss Reference Information and Speciation Methodology

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 many 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 and Ch. 19.2, and Ch. 19.5. Pages: 135

4th Edition | October 2023 | Product Number: H190404 | Price: $262.00

Chapter 19.5
Atmospheric Hydrocarbon Emissions from Marine Vessel and Land Based Transfer Operations

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. Pages: 64

2nd Edition | July 2023 | Product Number: H190502 | Price: $231.00

Chapter 19.6.1
Evaporative Loss from Storage Tank Floating-Roof Landings (formerly TR 2567)

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: 38

1st Edition | February 2017 | Reaffirmed: December 2022
Product Number: H1906011 | Price: $155.00

■ 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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Chapter 19.6.2
Evaporative Loss from the Cleaning of Storage Tanks

Provides guidance for estimating emissions that result from forced ventilation of storage tanks such as may occur while 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 forced ventilation. This standard does not address:

- the fate of vapors after they have left the tank (other than accounting for the efficiency of a control device, as discussed in Section 8);
- 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. Pages: 88

1st Edition | September 2019 | Product Number: H1906021 | Price: $181.00

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: $171.00

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: $243.00

TR 2568
Evaporative Loss from the Cleaning of Storage Tanks

Provides guidance for estimating emissions that result from removing the liquid heel (free-standing stock liquid) and cleaning the remaining deposits of stock liquid mixed with residue and water (sludge) from the bottoms of aboveground storage tanks. The emissions addressed in this report are those that leave the tank during the tank cleaning process. This report does not address:

- the fate of vapors after the have left the tank (other accounting for the efficiency of the control device),
- the fate of sludge after it has left the tank (or emissions that may occur during sludge treatment or disposal), or
- emissions that may be expelled by the vacuum pump of a vacuum truck or suction pump, if such devices are used in the tank cleaning process.

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

1st Edition | November 2007 | Product Number: H25680 | Price: $132.00

TR 2569
Evaporative Loss from Closed-Vent Internal Floating-Roof Storage Tanks

Addresses evaporative loss from internal floating-roof tanks (IFRTs) with closed vents. When the vents in the fixed roof of an IFRT are closed, rather than open, estimation of emissions is shown to be highly complex. This subject is not covered in other API standards such as 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: $132.00

TR 2574
Field Testing Protocol for Characterization of Total Gaseous Nonmethane Organics (TGNMO), Methane, and Ethane in Air-Vapor Mixture During Filling of a Cargo Vessel with Crude Oil

Provides a standardized testing methodology for quantifying total gaseous nonmethane organics (TGNMO), methane, and ethane, in the air-vapor mixture that is expelled from cargo compartments during filing with crude oil. It utilizes a modified version of Federal Reference Method 25 (FRM 25) to characterize the concentration of TGNMO, methane, and ethane. While the field testing in support of this protocol was performed only for the loading of crude oil into barges, the method could be suitable for loading of any volatile organic liquid into any type of vessel or compartment from which vapors are exhausted through a single vent opening where the field sampling can take place. Pages: 56

1st Edition | August 2016 | Product Number: H257401 | Price: $130.00

TR 2576
Short-Term Evaporative Loss Estimation from Atmospheric Storage Tanks

Provides methodology on how to estimate short-term individual tank and facility-wide emissions. The methodology in this technical report can be used for purposes such as preparing permit applications and air dispersion modeling. The technical report does not provide guidance on how to run the actual air dispersion model. Pages: 18

1st Edition | July 2016 | Product Number: H257601 | Price: $137.00

Chapter 20
Production Measurement and Allocation of Oil and Natural Gas

Chapter 20.1
Allocation Measurement
(includes Addendum 1 dated January 2013, Addendum 2 dated November 2016, and Addendum 3 dated December 2017)

Provides design and operating guidelines for liquid and gas allocation measurement systems. Included are recommendations for metering, static measurement, sampling, proving, calibrating, and calculating procedures. Pages: 67

1st Edition | September 1993 | Reaffirmed: June 2024
Product Number: H30701 | Price: $135.00

Chapter 20.2
Production Allocation Measurement Using Single-Phase Devices

Covers the application of production allocation (determination of flow quantities and rates of oil, gas, water, and other constituents) using single-phase measurement devices in combination with a two- or three-phase production separator.

This standard is applicable to single-phase measurement techniques upstream of the custody transfer points where custody transfer conditions are not possible. The standard presents single-phase flow measurement used in the allocation process and located downstream of the first stage of separation on a production facility.

This standard addresses common allocation single-phase flow measurement devices for liquid hydrocarbons, water, and gas including ancillary flow measurement systems such as fuel, flare, and recirculation.

This standard discusses configuration and operation of flow measurement equipment, fluid properties, production processing, associated flow conditions, and their effects on the quality of the flow measurement results. This standard discusses the possible impacts on these devices during inefficient and/or ineffective separation.

This document provides guidance with respect to the major factors that could contribute to measurement uncertainty for single-phase devices used in production allocation. It is not intended to prescribe a particular meter type or allocation method. Allocation methodologies are addressed in Ch. 20.1. Pages: 33

1st Edition | November 2016 | Product Number H200201 | Price: $154.00

Chapter 20.2 *
Production Allocation Measurement Using Single-Phase Devices—Spanish

Spanish translation of Ch. 20.2.

1st Edition | November 2016 | Product Number H200201S | Price: $154.00

Chapter 20.3 ■
Measurement of Multiphase Flow

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. 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. Pages: 62

2nd Edition | February 2024 | Product Number: G20.302 | Price: $301.00

Chapter 20.5
Recommended Practice for Application of Production Well Testing in Measurement and Allocation
(includes Errata 1 dated August 2023)

Establishes a framework to conduct and apply production well testing for well rate determination in measurement and allocation. Production well testing addressed in this document refers to measurement of gas, oil, and water quantities from a single well during a specified length of time under controlled operational conditions. The intent of this document is to provide operators with a consistent and transparent approach for conducting, applying, and managing production well testing within an upstream measurement and allocation system. It is not intended to prescribe a particular production well test method, or particular application of production well test data use in allocation.

This document provides recommendations and guidelines for the application of production well testing in production measurement and allocation. The recommendations and guidelines apply to conducting a production well test, calculating production well test volumes and rates, and the application of production well test data for use in measurement and allocation. This includes production well testing preparation, initiation, measurement, validation, and volume and rate calculations for separator, multiphase flow meter, and tank production well test systems. Additionally, this document addresses the proration of production well test results for use in allocation, the application of production well tests for validation and update of well flow models and virtual flow metering, and the adjustment of gas well continuous measurement results with production well test data.

This document also provides recommendations and guidelines for the application of well flow modeling and virtual flow metering in production measurement and allocation.

Allocation methodologies are addressed in Ch. 20.1. Pages: 123

1st Edition | December 2017 | Reaffirmed: March 2023
Product Number: H200501 | Price: $231.00

Draft Standard
Application of Hydrocarbon Phase Behavior Modeling in Upstream Measurement and Allocation Systems

Provides requirements and guidelines for 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.

This document establishes a framework to develop, implement, and manage the application of hydrocarbon phase behavior modeling. The applied phase behavior modeling addressed in this document refers to PSM incorporating EOS description of the phase behavior, or pressure, volume, temperature (PVT) properties, of the fluids within the modeled process. The intent of this document is to provide operators with a consistent and transparent approach for applying and managing an EOS-based PSM within an upstream measurement and allocation system. It is not intended to prescribe a particular mathematical phase estimation (i.e. EOS), process simulation (i.e. PSM), or allocation method. Allocation methodologies are addressed in Ch. 20.1. Pages: 47

1st Edition | August 2016 | Product Number: H200401D | Price: $98.00

RP 85
Use of Subsea Wet-Gas Flowmeters in Allocation Measurement Systems
(includes Addendum 1 dated January 2013)

Presents a recommended allocation methodology that best fits the application and that equitably accommodates variances in the uncertainty level between meters in the system. It is intended to advise the user on various aspects of the use of subsea wet-gas flowmeters in allocation measurement systems. Marinization, operation, abnormal operation, and meter testing are important topics included here, but foremost, this document proposes techniques to be used in the allocation of total production to individual contributing streams. Pages: 64

1st Edition | March 2003 | Reaffirmed: October 2013
2-Year Extension: October 2018 | Product Number: G08501 | Price: $134.00

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RP 85 *
Use of Subsea Wet-Gas Flowmeters in Allocation Measurement Systems—Russian
(includes Addendum 1 dated January 2013)

Russian translation of RP 85.

1st Edition | March 2003 | Reaffirmed: October 2013
Product Number: G08501R | Price: $134.00

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

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

Provides design and operating guidelines for sampling, sample handling, and analysis for high water content streams, up to 50 % water on a volumetric basis. As a guide, this RP targets a relative accuracy of 5 % of reading up to a maximum of 50 % water content as a qualifier for various methods described herein. For example, the corresponding absolute accuracy for a 10 % water content stream is ±0.5 % and for 20 % water content is ±1.0 %. Pages: 19

1st Edition | August 2007 | Reaffirmed: October 2022
Product Number: G08701 | Price: $113.00

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
Flow Measurement Using Electronic Metering Systems—Electronic Gas Measurement
(ANSI/API *MPMS* Ch. 21.1-2011) (AGA Report No. 13)

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 | Reaffirmed: June 2021
2-Year Extension: December 2018
Product Number: H210102 | Price: $204.00

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

1st Edition | June 1998 | Reaffirmed: October 2016
Product Number: H21021 | Price: $237.00

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 Ch. 21.2 and the methods and procedures are as described in 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 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.

1st Edition | August 2000 | Reaffirmed: October 2016
Product Number: H2102A | Price: $66.00

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)
(includes Addendum 1 dated November 2018 and Addendum 2 dated February 2022)

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: $109.00

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Chapter 22.2
Testing Protocols—Differential Pressure Flow Measurement Devices

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: 52

2nd Edition | April 2017 | Reaffirmed: February 2022
Product Number: H220202 | Price: $129.00

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: $122.00

Chapter 22.4
Testing Protocol for Pressure, Differential Pressure, and Temperature Measuring Devices

Documents the method for testing the performance characteristics specific to pressure, differential pressure, and temperature sensors and transmitters used in petroleum measurement. The testing protocol includes a listing of parameters affecting the performance of the devices, a description of the tests required, requirements for the test facility, a data reporting format, and an uncertainty determination methodology. Pages: 44

1st Edition | July 2018 | Product Number: H220401 | Price: $93.00

Chapter 22.5 ■
Testing Protocols—Flow Computational Device
(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. Pages: 38

1st Edition | March 2024 | Product Number: H22.501 | Price: $112.00

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: $122.00

Chapter 22.7
Testing Protocol for Multiphase Meter

Provides the minimum requirements for documenting performance testing of an inline multiphase flow meter under controlled flowing conditions in a flow loop facility. Completion of the testing protocol is not a calibration and does not replace field testing and validation. This testing protocol documents the method for testing the performance characteristics of multiphase flow meters used in production allocation. The testing protocol includes a listing of parameters affecting the performance of the devices, a description of the tests required, requirements for the test facility, a data reporting format, and an uncertainty determination. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM 77. Pages: 23

1st Edition | January 2023 | Product Number: H22.701 | Price: $72.00

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 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: $110.00

Chapter 23.1 *■
Reconciliation of Liquid Pipeline Quantities—Spanish
(supersedes Std 2560)

Spanish translation of Ch. 23.1.

1st Edition | June 2016 | Product Number: H230101S | Price: $110.00

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Chapter 23.2
Reconciliation of Liquid Tank Car(s) Quantities

Provide methodologies and processes to monitor liquid tank car movements' quantity loss/gain (L/G) ratios, level, and/or quality differences for tank car measurement systems. This document does not establish an industry standard for L/G ratios or level, but under normal operating conditions, the standard will assist the user to identify L/G of any tank car system. It will assist to determine:

- ratio or level deviations,
- patterns or trends,
- liquid quality.

This document will also make available operational and statistically based tools to:

- identify when a system exhibits a deviation from its normal operating conditions,
- guidelines for identifying the causes of the deviation from its normal operating perimeters. Pages: 48

1st Edition | August 2020 | Product Number: H230202 | Price: $138.00

TR 2503 ■
Properties of Metals and Alloys for Use in Measurement Equipment

Consolidates the industry available data for the thermal expansion coefficients and the modulus of elasticity of the typical metals used in the API *MPMS* suite of documents. This document does not develop or calculate any of these properties. Pages: 17

1st Edition | April 2024 | Product Number: H250301 | Price: $80.00

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: $138.00

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 | March 2011 | Product Number: H257101 | Price: $154.00

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 measuring the volume/mass of process fuel gas or feedstock, and the *API Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Natural Gas Industry* can be reference for guidance on the calculation of emissions.

TR 2572 provides guidance and a methodology for the determination of carbon content from hydrocarbon-based petroleum and petrochemical products, and the uncertainty of the average carbon content as calculated from multiple samples taken during a reporting period. This method is intended to make use of industry-accepted mixture property data and test methods with no new or modified test methods introduced in this document. The method is applicable to carbon-content-based reporting or trading for all gaseous and liquid hydrocarbons.

This TR provides references and supplemental information on applicable industry practices based on the published resources, existing industry standards, industry-accepted physical constants, or properties of hydrocarbons for measurement, sampling, sampling frequency, and analysis of hydrocarbon samples. Pages: 24

1st Edition | May 2013 | Product Number: H257201 | Price: $125.00

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: $71.00

TR 2577
Performance of Full-Bore Vortex Meters for Measurement of Liquid Flows

Provides documentation of performance characteristics of full-bore liquid vortex meters for measuring liquid hydrocarbon flows of different API gravity under the field operating conditions and under a controlled environment in a laboratory test facility with water as the proving fluid, limited laboratory proving facility test results using water as the calibration fluid of several and 2-in. (50 mm) and 4-in. (100 mm) commercially available full-bore vortex meters that are typically installed for non-custody transfer liquid installations, and typical performance of full-bore 4-in. (100-mm) liquid vortex meters for liquid hydrocarbon measurement and to provide guidance in selecting liquid vortex meters for custody transfer measurement. Pages: 30

1st Edition | July 2018 | Product Number: H257701 | Price: $89.00

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TR 2578
Flow Conditioner Installation and Effects on Turbine Meters

Provides a summary of flow conditioning testing performed on turbine meters in liquid hydrocarbons. Initial testing was conducted in water and those findings were included as an addendum to Ch. 5.3 in 2009, subsequent testing in hydrocarbon liquids was carried out through July 2016.

Phase II testing focused on operational effects, specifically the relationship of strainer design, strainer basket disturbances, flow conditioning, and their effects on the flow meter deviations in hydrocarbon applications (viscosities, densities, and Reynolds number). Pages: 16

1st Edition | October 2017 | Product Number: H257801 | Price: $81.00

TR 2579
Liquid Hydrocarbon Measurement Uncertainty Calculations

Provides guidelines for the calculation of uncertainty for field stored and transported hydrocarbon liquids. Special emphasis is placed on the measurement uncertainty of crude oils measured at tanks, by lease automatic custody transfer (LACT), and alternative measurement systems. This document provides a methodology for calculating the uncertainty in the measurement of liquid hydrocarbons by flow measurement systems. Specifically, uncertainty performance expressions are developed for positive displacement and Coriolis meter types under API *Manual of Petroleum Measurement Standards* (*MPMS*) Chapter 5 for measuring hydrocarbons by volume. This includes ancillary devices, processes, and measurements used to calculate a net standard volume (NSV) such as pressure, temperature, density, and sediment and water (S&W). Pages: 39

1st Edition | September 2020
Product Number: H257901 | Price: $214.00

TR 2581 ■
Wet Gas Sampling

Presents a study that seeks to quantify measurement uncertainty associated with using dry gas sampling methods to sample wet gas streams, and to provide recommendations for future wet gas sampling test programs. This report summarizes the wet gas testing methodology, test setup, test results, conclusions, lessons learned, and recommendations. Pages: 49

1st Edition | May 2024 | Product Number: H258101 | Price: $120.00

TR 2582 ■
Vapor Pressure of Heavy Petroleum Liquids for Estimating Emissions

Provides methodology to predict the vapor pressure for heavy products over a range of temperatures by evaluating the results of simulated distillation tests in process simulation software. Pages: 37

1st Edition | November 2024 | Product Number: H258201 | Price: $132.00

■ 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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NOTE Free publications with an asterisk are subject to a $10.00 handling charge for each total order, plus actual shipping charges.

GENERAL

Publ 1593
Gasoline Marketing in the United States Today

Provides information on motor fuel and gasoline consumption, U.S. motor fuel distribution, the U.S. gasoline pricing system, motor gasoline prices and taxes, the number/configuration of retail gasoline outlets, and employment/productivity in the retail gasoline distribution industry. Pages: 77

3rd Edition | May 1992 | Product Number: A15930 | Price: $143.00

Publ 1673
Compilation of Air Emission for Petroleum Distribution Dispensing Facilities

Compiles the most widely accepted, available emission factors and emission estimation techniques for developing air emission estimates from evaporative loss sources of petroleum products at marketing and distribution facilities. These losses can occur from transfer and storage operations and fugitive equipment leaks and spillage. Pages: 29

2nd Edition | July 2009 | Product Number: A16732 | Price: $101.00

AVIATION

RP 1543
Documentation, Monitoring and Laboratory Testing of Aviation Fuel During Shipment from Refinery to Airport

Aviation fuels pass through a variety of storage and handling facilities, from refinery to airport. As aviation fuels are stored and transported in storage and transportation systems where contact with non-aviation products may occur, a fuel quality monitoring program is required, in addition to equipment, operating, inspection and maintenance standards. The purpose of this practice is to ensure the fuel remains on specification. This recommended practice (RP) was written to provide guidance on the development of an aviation fuel monitoring and testing program (fuel quality monitoring program) for aviation fuel from point of manufacture to delivery to the airport. "Proper handling" entails documenting and testing aviation fuel quality as product is transported throughout the supply chain to maintain the original product specification. Pages: 25

1st Edition | July 2009 | Reaffirmed: April 2019
Product Number: A154301 | Price: $75.00

RP 1595
Design, Construction, Operation, Maintenance, and Inspection of Aviation Pre-Airfield Storage Terminals

Contains basic requirements for the design, construction, operation, and maintenance of pre-airfield storage terminals located directly upstream of the airport, hereafter referred to as "pre-airfield storage terminals." This recommended practice 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 | Reaffirmed: April 2019
Product Number: C159502 | Price: $289.00

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

EI 1529
Aviation Fuelling Hose

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

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

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

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

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

EI 1584
Four-Inch Aviation Hydrant System Components and Arrangements

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

EI 1590
Specifications and Qualification Procedures for Aviation Fuel Microfilters

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

EI 1596
Design and Construction of Aviation Fuel Filter Vessels

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

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

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

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

MARKETING OPERATIONS

RP 1525 ◆
Bulk Oil Testing, Handling, and Storage Guidelines

Provides recommended equipment and procedures for the proper handling of incoming and outgoing shipments of lubricants to prevent contamination and spillage, and to protect product quality. The guidelines cover receipt, storage, packaging, and shipment of finished lubricants in bulk or packaged goods ranging from Intermediate Bulk Containers (IBCs) to pails. A log (whether electronic or hardcopy) detailing incoming and outgoing shipments is recommended and may be mandatory in some jurisdictions. Pages: 37

2nd Edition | June 2021 | Product Number: F15252

You may download a PDF of this document from https://www.api.org/products-and-services/engine-oil/documents/1525-guidelines

API 1525A
Bulk Engine Oil Chain of Custody and Quality Documentation

Provides procedures for managing bulk engine oil chain of custody to ensure oil quality from the point of manufacture to installation in the end user's engine. The procedures specifically address the following key topics: Bulk Engine Oil Provider (BEOP) practices; the ordering of oils meeting API 1509; chain-of-custody documentation that identifies bulk engine oil throughout the supply system; and requirements for informing consumers about the types of engine oil available for installation and requirements for notification (written and/or electronic) and labeling of the oil installed in mobile equipment engines. Pages: 19

2nd Edition | November 2021 | Product Number: F1525A2

You may download a PDF of this document from https://www.api.org/products-and-services/engine-oil/documents/api-1525a

RP 1604
Closure of Underground Petroleum Storage Tanks

Provides operating procedures that may be used for the abandonment, removal, storage, temporarily-out-service, and sale of used underground tanks that have contained gasoline or other flammable liquids. Pages: 22

4th Edition | February 2021 | Product Number: A16044 | Price: $103.00

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

6th Edition | April 2011 | Reaffirmed: May 2020
Product Number: A16156 | Price: $255.00

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

5th Edition | May 1993 | Reaffirmed: May 2020
Product Number: A16210 | Price: $103.00

RP 1626
Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Filling Stations
(includes Errata 1 dated February 2011)

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

2nd Edition | August 2010 | Reaffirmed: May 2020
Product Number: A16262 | Price: $193.00

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

5th Edition | June 2001 | Reaffirmed: May 2020
Product Number: A16315 | Price: $108.00

RP 1637
Using the API Color-Symbol System to Identify Equipment, Vehicles, and Transfer Points for Petroleum Fuels and Related Products at Dispensing and Storage Facilities and Distribution Terminals

Describes a system for marking equipment used to store and handle bulk petroleum, alcohol-blended petroleum and biodiesel products. The marking system described in this recommended practice does not cover aviation fuels. Marking systems for aviation fuels are described in API/IP Std 1542. Pages: 22

4th Edition | April 2020 | Product Number: A16374 | Price: $95.00

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

1st Edition | July 2003 | Reaffirmed: May 2020
Product Number: A16391 | Price: $108.00

RP 1640
Product Quality in Light Product Storage and Handling Operations

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 recommended practice also covers the minimum equipment standards and operating procedures for the receipt, storage, and 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. Pages: 85

2nd Edition | February 2021 | Product Number: A164002 | Price: $259.00

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 M85, but also includes alcohols and ethers because they may be present at terminals and bulk plants for blending purposes. Pages: 12

1st Edition | February 1996 | Product Number: A16421 | Price: $76.00

RP 1646
Safe Work Practices for Contractors Working at Retail Petroleum/ Convenience Facilities

Provides the recommended minimum safety procedures for working at retail petroleum/convenience facilities and is a key component of the API WorkSafe Program. It also details how to develop a task specific Job Safety Analysis that should be completed before any work may begin. This document also provides the user with a general awareness of safety issues associated with maintenance and construction work at retail petroleum/ convenience facilities, including service stations. It also highlights many of the Federal OSHA requirements that may apply to maintenance and construction work in the retail petroleum/convenience business. Pages: 84

2nd Edition | May 2017 | Reaffirmed: September 2022
Product Number: A164602 | Price: $182.00

RP 1646 *
Safe Work Practices for Contractors Working at Retail Petroleum/ Convenience Facilities—Spanish

Spanish translation of RP 1646.

2nd Edition | May 2017 | Reaffirmed: September 2022
Product Number: A164602S | Price: $182.00

Std 2610
Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities

Guides the management of terminals and tanks in a manner that protects the environment and the safety of workers and the public. This standard is intended for petroleum terminal and tank facilities associated with marketing, refining, pipeline, and other similar facilities. This standard may be used as a resource and management guide by those responsible for such facilities and by those working on their behalf. This standard is a compilation of industry knowledge, information, and management practices for all relevant aspects of terminal and tank operations aggregated into an overview document comprising best practices. Pages: 100

3rd Edition | September 2018 | Product Number: C26103 | Price: $222.00

USED OIL

A Guidebook for Implementing Curbside and Drop-Off Used Motor Oil Collection Programs

Designed to help municipal managers and regulators evaluate the types of available programs (either curbside or drop-off programs, including examples of both), and how to effectively implement these used oil recycling programs. It is based on national surveys of existing programs throughout the country and includes examples of budgets, procedures, equipment, and model programs that are currently underway. Pages: 47

1st Edition | February 1992 | Product Number: B20002 | Price: Free

Publ 1835 ◆
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: $65.00

TANK TRUCK OPERATIONS

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

8th Edition | January 2003 | Reaffirmed: February 2011
2-Year Extension: January 2018
Product Number: A10048 | Price: $138.00

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RP 1007
Loading and Unloading of MC 306/DOT 406 Cargo Tank Motor Vehicles

Ensuring the safe and efficient loading and delivery of petroleum products to retail service stations and bulk facilities is the primary goal for all companies that transport product. This document is a guideline for use by the truck driver and persons responsible for loading and unloading of MC306/DOT406 cargo tanks. It identifies specific steps to ensure that product can be loaded into tank trucks and unloaded into both underground and aboveground storage tanks in a safe and efficient manner that protects the environment. It is intended to be used in conjunction with existing driver training programs and procedures. Pages: 24

1st Edition | March 2001 | Reaffirmed: February 2011
2-Year Extension: January 2018
Product Number: A10071 | Price: $42.00

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

Provides minimum guidelines for developing an emergency response plan for incidents involving hazardous liquid hydrocarbons, such as gasoline and crude oil, transported in MC 306/DOT 406 and MC 307/DOT 407 aluminum cargo tanks, and for coordinating and cooperating with local, state, and federal officials. Covers response plan priorities, personnel training, special equipment, media relations, environmental relations, and post-response activities. The appendixes outline a highway emergency response plan and suggest a procedure for removing liquid hydrocarbons from overturned cargo tanks and righting the tank vehicles. Pages: 21

3rd Edition | November 1997 | Reaffirmed: February 2011
2-Year Extension: January 2018
Product Number: A11123 | Price: $82.00

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.

Single copies free on request from API [eolcs@api.org or (202)-682-8516]

API 1509 ◆
Engine Oil Licensing and Certification System

Describes the API Engine Oil Licensing and Certification System (EOLCS), a voluntary licensing and certification program designed to define, certify, and monitor engine oil performance deemed necessary for satisfactory equipment life and performance by vehicle and engine manufacturers.

22nd Edition | February 2022 | For a free copy of this document, please visit https://www.api.org/products-and-services/engine-oil/documents/api-1509-documents

API 1509 *
Engine Oil Licensing and Certification System—Chinese

Chinese translation of API 1509.

21st Edition | February 2022 | For a free copy of this document, please visit https://www.api.org/products-and-services/engine-oil/documents/api-1509-documents

API 1509 *
Engine Oil Licensing and Certification System—Portuguese

Portuguese translation of API 1509.

21st Edition | February 2022 | For a free copy of this document, please visit https://www.api.org/products-and-services/engine-oil/documents/api-1509-documents

API 1509 *
Engine Oil Licensing and Certification System—Spanish

Spanish translation of API 1509.

21st Edition | February 2022 | For a free copy of this document, please visit https://www.api.org/products-and-services/engine-oil/documents/api-1509-documents

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, https://www.api.org/products-and-services/engine-oil/documents/publication-1520

DIESEL FUEL

Publ 1571
Diesel Fuel—Questions and Answers for Highway and Off-Highway Use

Provides answers to some of the frequent questions asked about diesel fuel. Included are explanations of the quality features of diesel fuel and their significance, descriptions of diesel fuel classifications, discussions of additives normally used and their purposes, and explanations of factors that can affect performance. Pages: 20

4th Edition | January 1996 | Product Number: F15714 | Price: $140.00

HEALTH, ENVIRONMENT, AND SAFETY: GENERAL

Std 2350
Overfill Protection for Storage Tanks in Petroleum Facilities
(includes Errata 1 dated April 2021)
(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.

*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.

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: 75

5th Edition | September 2020
Product Number: K235005 | Price: $154.00

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: $94.00

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: $120.00

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: $103.00

HEALTH, ENVIRONMENT, AND SAFETY: SOIL AND GROUNDWATER

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: $64.00

Publ 1628B
Risk-Based Decision Making

Discusses risk-based decision making approaches used for the assessment of hazardous conditions. Also presents information that can be utilized to focus remedial measures and funds on petroleum hydrocarbon release sites while being protective of human health and the environment, and to facilitate timely closure of hydrocarbon-impacted sites. Pages: 13

1st Edition | July 1996 | Product Number: A1628B | Price: $64.00

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: $64.00

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: $64.00

Publ 1628E
Operation and Maintenance Considerations for Hydrocarbon Remediation Systems

Discusses concepts regarding operation and maintenance procedures necessary to achieve and maintain optimal performance of petroleum hydrocarbon remediation systems. Pages: 23

1st Edition | July 1996 | Product Number: A1628E | Price: $64.00

Publ 1629
Guide for Assessing and Remediating Petroleum Hydrocarbons in Soils

This publication provides information regarding the site and release characteristics relevant to, and methods for assessing and remediating, soils contaminated with petroleum hydrocarbons released from underground or aboveground storage tank systems and operations. Developed to complement Publ 1628, which focuses primarily on assessing and remediating petroleum releases that may impact groundwater. Pages: 81

1st Edition | October 1993 | Product Number: A16290 | Price: $187.00

To purchase individual API standards, visit apiwebstore.org

SECURITY

Std 1164
Pipeline Control Systems Cybersecurity
(includes Errata 1 dated August 2021)

Provides requirements and guidance for managing cyber risk associated with industrial automation and control (IAC) environments to achieve security, integrity, and resiliency objectives. This is accomplished through proper isolation of IAC environments from non-IAC environments to help IAC operational continuity. This standard is tailored for the oil and natural gas (ONG) pipeline industry, which includes, but is not limited to, natural gas and hazardous liquid transmission pipeline systems, natural gas distribution pipeline systems, liquefied natural gas (LNG) facilities, propane air facilities, and others involved in these industries. This standard was developed to provide an actionable approach to protect IAC essential functions by managing cybersecurity risk to IAC environments. IAC environments can include, but are not limited to, supervisory control and data acquisition (SCADA), local control, and industrial internet of things (IIoT) solutions. This standard should be used in the context of developing, implementing, maintaining, and improving an IAC cybersecurity program, which includes the policies, processes, and procedural and technical controls for IAC cyber environments. Pages: 142

3rd Edition | August 2021 | Product Number: D11043 | Price: $227.00

■ 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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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: 46

1st Edition | September 2014 | Reaffirmed: December 2022
Product Number: A30001 | Price: $155.00

PIPELINE PUBLIC EDUCATION AND AWARENESS

API Guidelines for Right-of-Way Activities
Brochure

The liquid petroleum pipeline industry has developed these guidelines to improve understanding and increase awareness of the nature of underground pipelines that transport oil, petroleum products, natural gas liquids, and other hazardous liquids and how to conduct land development and use activity near pipeline rights of way.

The guidelines are intended for use by anyone who is involved in land development, agriculture and excavation/construction activities near a pipeline. The industry's goal is to protect public safety of the people who live and work along pipeline rights of way, protect the environment along rights of way, and maintain the integrity of the pipeline so that petroleum products can be delivered to customers safely and without interruption.

A pipeline right-of-way (ROW) is property in which a pipeline company and a landowner both have a legal interest. Each has a right to be there, although each has a different type of use for the land. Pipeline companies are granted permission from private landowners to transport petroleum products across their private lands. That permission is documented in a written agreement called an easement, and it is obtained though purchase, license, or by agreement with the landowner. In cases where the land is owned by the government—whether local, state or federal—similar arrangements for easements, licenses or occupancy agreements are obtained.

A pipeline requires regular observation, integrity assessment and maintenance to maintain the safety of its operations. Part of that task is to ensure that the pipeline ROW is kept clear of trees, structures and other encroachments that might interfere with the safe operation of the pipeline and the pipeline company's access to the line.

The pipeline industry hopes that these guidelines will help both pipeline operators and people working and living along pipeline rights of way to better understand their respective responsibilities for maintaining the safety of this vital, but invisible, transportation system.

1st Edition | August 2018 | Product Number: DOGP04
Price: $14.00 ($68.00 for set of five brochures)

PIPELINE OPERATIONS PUBLICATIONS

RP 80
Definition of Onshore Gas Gathering Lines
(includes Addendum 1 dated January 2023)

Developed by an industry coalition that included representatives from over 20 petroleum industry associations, this recommended practice 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: 47

2nd Edition | March 2020 | Product Number: G80002 | Price: $134.00

RP 1102
Steel Pipelines Crossing Railroads and Highways
(includes Errata 1 dated November 2008, Errata 2 dated May 2010, Errata 3 dated September 2012, Errata 4 dated February 2014, and Errata 5 dated March 2014)

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 crossed by railroad or highway construction. This practice should not be applied retroactively. Neither should it apply to pipelines under contract for construction on or prior to the effective date of this edition. Neither should it be applied to directionally drilled crossings or to pipelines installed in utility tunnels. Pages: 64

7th Edition | December 2007 | Reaffirmed: June 2024
Product Number: D11021 | Price: $144.00

Std 1104
Welding of Pipelines and Related Facilities
(includes Errata 1 dated September 2023)

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, and 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. Pages: 174

22nd Edition | July 2021| Product Number: D110422 | Price: $470.00

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Std 1104 *■
Welding of Pipelines and Related Facilities—Chinese
(includes Errata 1 dated September 2023)

Chinese translation of Std 1104.

22nd Edition | July 2021 | Product Number: D110422C | Price: $470.00

Std 1104 *
Welding of Pipelines and Related Facilities—Russian
(includes Errata 1 dated September 2023)

Russian translation of Std 1104.

22nd Edition | July 2021 | Product Number: D110422R | Price: $470.00

RP 1109
Line Markers and Signage for Hazardous Liquid Pipelines and Facilities

Addresses the permanent marking of liquid petroleum pipeline transportation facilities. It covers the design, message, installation, placement, inspection, and maintenance of markers and signs on pipeline facilities located onshore and at inland waterway crossings. Markers and signs indicate the presence of a pipeline facility and warn of the potential hazards associated with its presence and operation. The markers and signs may contain information to be used by the public when reporting emergencies and seeking assistance in determining the precise location of a buried pipeline.

The provisions of this 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: 24

5th Edition | October 2017 | Product Number: D11095 | Price: $122.00

RP 1110
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). Pages: 37

7th Edition | December 2022
Product Number: D111007 | Price: $118.00

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: 78

5th Edition | September 2015 | Reaffirmed: January 2021
Product Number: D11115 | Price: $175.00

RP 1115
Design and Operation of Solution-Mined Salt Caverns Used for Liquid Hydrocarbon Storage

Provides guidance on the design and operation of solution-mined underground hydrocarbon liquid or liquefied petroleum gas storage facilities. It is intended for cavern engineers, supervisors, and all persons involved in liquid 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 liquid hydrocarbon underground storage design and operation are covered, including site selection, cavern development, cavern hydraulics, brine facilities, wellhead and hanging strings, cavern testing, and cavern abandonment. A section on risk management is included. Pages: 112

2nd Edition | November 2018 | Product Number: D11152 | Price: $195.00

RP 1117
Recommended Practice for Movement in In-Service Pipelines
(includes Errata 1 dated December 2008 and Errata 2 dated August 2009)

Covers the design, execution, inspection, and safety of a pipeline-lowering or other movement operation conducted while the pipeline is in service. (In this document, the terms lowering and movement can be used interchangeably.) This recommended practice presents general guidelines for conducting a pipeline-movement operation without taking the pipeline out of service. It also presents equations for estimating the induced stresses. To promote the safety of the movement operation, it describes stress limits and procedures. Additionally, it outlines recommendations to protect the pipeline against damage. The practicality and safety of trench types, support systems, and lowering or other methods are considered. Inspection procedures and limitations are presented. Pages: 46

3rd Edition | July 2008 | Reaffirmed: March 2024
Product Number: D11173 | Price: $164.00

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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 liquid pipelines. These systems provide tools that assist controllers in detecting commodity releases that are within the sensitivity of an algorithm. CPM system provide an alarm and display other related data to the controllers to aid in decision-making. The controllers would undertake an immediate investigation, confirm the reason for the alarm, and initiate an operational response to the hydraulic anomaly when the alarm represents an irregular operating condition, abnormal operating condition, or a commodity release. This RP is intended for controllers and operators, CPM system developers and engineers, and others interested in CPM system design, implementation, and operation. Pages: 44

2nd Edition | April 2022 | Product Number: D011302 | Price: $140.00

RP 1133
Managing Hydrotechnical Hazards for Pipelines Located Onshore or Within Coastal Areas

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: 94

2nd Edition | December 2017 | Product Number: D11332 | Price: $201.00

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: $204.00

RP 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 order to reduce 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 incidents; examine the likelihood and potential severity of 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 recommended practice (RP) is specifically designed to provide the operator with a description of industry-proven practices in pipeline integrity management.

The RP is largely targeted to onshore pipelines along the right-of-way, but the process and approach can be applied to pipeline facilities, including pipeline stations, terminals, and delivery facilities associated with pipeline systems. Pages: 137

3rd Edition | February 2019 | Reaffirmed: March 2024
Product Number: D116003 | Price: $259.00

RP 1161
Pipeline Operator Qualification (OQ)

Provides guidance for developing and maintaining an operator qualification (OQ) program. This document is comprised of the RP along with normative and non-mandatory, informative annexes. This RP is applicable for all pipelines, both onshore and offshore, subject to 49 *CFR* Part 192 and/or Part 195. References to 49 *CFR* Part 192 are applicable to gas-transmission-only tasks, and references to 49 *CFR* Part 195 are applicable to liquid-only tasks. Operators may choose to use all, part, or none of this document as applicable to their operations. Pages: 284

5th Edition | November 2021 | Product Number: D11615 | Price: $247.00

RP 1162
Public Awareness Programs for Pipeline Operators
(includes Errata 1 dated February 2023)

Addresses the development, implementation, evaluation, and documentation of pipeline public awareness programs associated with systems in the United States for distribution, regulated transmission, gathering pipelines, and underground storage that are required under federal or state pipeline safety regulations to have a public awareness program. It provides minimum requirements and offers guidance to operators to develop public awareness programs that take into account the similarities and differences in pipeline types, release characteristics, stakeholder audiences, operator activities, and other factors that can influence the program's development and implementation. This document provides operators with public awareness program elements and illustrates the process for establishing, implementing, measuring, and adjusting a program, in alignment with the Plan–Do–Check–Act (PDCA) process for managing programs. This recommended practice addresses certain operational changes requiring additional communication based on the introduction of new hazards. Pages: 108

3rd Edition | August 2022 | Product Number: D116203 | Price: $165.00

Std 1163
In-Line Inspection Systems Qualification

Covers the qualification, selection, reporting, verification, validation, and use of in-line inspection (ILI) systems for onshore and offshore steel 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. Pages: 113

3rd Edition | September 2021 | Product Number: D11632 | Price: $163.00

Std 1164
Pipeline Control Systems Cybersecurity
(includes Errata 1 dated August 2021)

Provides requirements and guidance for managing cyber risk associated with industrial automation and control (IAC) environments to achieve security, integrity, and resiliency objectives. This is accomplished through proper isolation of IAC environments from non-IAC environments to help IAC operational continuity. This standard is tailored for the oil and natural gas (ONG) pipeline industry, which includes, but is not limited to, natural gas and hazardous liquid transmission pipeline systems, natural gas distribution pipeline systems, liquefied natural gas (LNG) facilities, propane air facilities, and others involved in these industries. This standard was developed to provide an actionable approach to protect IAC essential functions by managing cybersecurity risk to IAC environments. IAC environments can include, but are not limited to, supervisory control and data acquisition (SCADA), local control, and industrial internet of things (IIoT) solutions. This standard should be used in the context of developing, implementing, maintaining, and improving an IAC cybersecurity program, which includes the policies, processes, and procedural and technical controls for IAC cyber environments. Pages: 142

3rd Edition | August 2021 | Product Number: D11043 | Price: $227.00

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RP 1165
Pipeline SCADA Displays

Focuses on the design and implementation of displays used for the display, monitoring, and control of information on pipeline supervisory control and data acquisition (SCADA) systems. The primary purpose is to promote the success of the controller to safely operate pipeline systems and to document industry practices that provide guidance to a pipeline company or operator who wants to select a new SCADA system, or update or expand an existing SCADA system, and for guidance throughout the SCADA system display lifecycle. The pipeline industry and stakeholders have determined that well-designed displays can contribute to safe operations and prevent or mitigate pipeline incidents. Using established human factors considerations in display design can promote the safety performance of a pipeline operator. Pages: 148

2nd Edition | December 2022
Product Number: D116502 | Price: $158.00

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: $131.00

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: 48

2nd Edition | June 2016 | Reaffirmed: October 2021
Product Number: D116702 | Price: $155.00

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: 28

2nd Edition | February 2015 | Reaffirmed: October 2021
Product Number: D11682 | Price: $113.00

RP 1168 *
Pipeline Control Room Management—Portuguese

Portuguese translation of RP 1168.

2nd Edition | February 2015 | Reaffirmed: October 2021
Product Number: D11682P | Price: $113.00

RP 1169
Pipeline Construction Inspection

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: 149

2nd Edition | March 2020 | Product Number: D11692 | Price: $225.00

RP 1169 *
Pipeline Construction Inspection—Chinese

Chinese translation of RP 1169.

2nd Edition | March 2020 | Product Number: D11692 | Price: $225.00

RP 1170
Design and Operation of Solution-Mined Salt Caverns Used for Natural Gas Storage

Provides the functional recommendations for salt cavern facilities used for natural gas storage service and covers facility geomechanical assessments, cavern well design and drilling, risk management, solution mining techniques and operations, including monitoring and maintenance practices, site security and safety, procedures, training, and abandonment. It provides a comprehensive set of design guidelines, recognizing 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 RP includes the cavern well system (wellhead, wellbore, and cavern) from the emergency shutdown (ESD) valve down to the cavern and facilities having significant impact to safety and integrity of the cavern system. Pages: 118

2nd Edition | November 2022
Product Number: D117002 | Price: $225.00

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RP 1171

Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs

(includes Errata 1 dated September 2023)

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 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. Pages: 72

2nd Edition | November 2022
Product Number: D117102 | Price: $225.00

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: 30

1st Edition | April 2014 | Reaffirmed: April 2000
Product Number: D11721 | Price: $107.00

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 and 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: 42

1st Edition | July 2015 | Reaffirmed: April 2023
Product Number: D117301 | Price: $107.00

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 194 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: $116.00

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. This RP is an industry consensus document revised by hazardous liquid pipeline operators, leak detection manufacturers, consultants, and others. RP 1175 focuses on using a risk-based approach to each operator's LDP. Reviewing the main body of this document and following the guidance set forth assists in creating an inherently risk mitigating LDP management system. RP 1175 represents industry best practices in managing an LDP. All leak detection systems (LDSs) used by a pipeline operator should be managed in a coordinated manner. The 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 LDSs, and therefore contains relatively little technical detail. As with RP 1130, RP 1175 is intended for single-phase pipelines only; however, the approach may be applicable to pipelines that are not single phase. Pages: 86

2nd Edition | April 2022 | Product Number: D11752 | Price: $199.00

RP 1176

Recommended Practice for Assessment and Management of Cracking in Pipelines

(includes Errata 1 dated February 2021)

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: 144

1st Edition | July 2016 | Reaffirmed: March 2024
Product Number: D117601 | Price: $208.00

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RP 1177
Recommended Practice for Steel Pipeline Construction Quality Management Systems

Establishes minimum Quality Management System (QMS) processes for organizations that own, operate, construct, or provide construction-related services for onshore carbon and low-alloy steel pipelines used in the transportation of hazardous liquids, carbon dioxide, and gas.

This recommended practice specifies the elements of a QMS to manage the construction process systematically from design verification, materials manufacturing, procurement, construction, inspection, and testing to initiation of operations. Pages: 68

1st Edition | November 2017 | Product Number: D110701 | Price: $147.00

Bull 1178 ■
Integrity Data Management and Integration

Provides a compendium of methodologies and considerations for integrating the underlying data used to support integrity management. Any one approach, let alone the entirety of the document, may not be appropriate or applicable in all circumstances. The document reviews possible approaches for consideration by operators in the context of their specific circumstances. The primary focus of this bulletin is the methodologies and processes used to spatially integrate and normalize the data to support the application of comparative techniques used in interpreting integrity data, with particular emphasis on in-line inspection (ILI) data. Pages: 71

2nd Edition | November 2024 | Product Number: D11782 | Price: $129.00

TR 1179
Hydrostatic Testing as an Integrity Management Tool

Provides guidelines related to hydrostatic testing as a tool for integrity management in gas and liquids pipelines. It specifically focuses on program design and key parameters for consideration in hydrostatic test programs, as well as potential detrimental effects of hydrostatic testing. Several case studies supplement the guidelines provided. Pages: 64

1st Edition | May 2019 | Product Number: D11791 | Price: $142.00

RP 1181
Pipeline Operational Status Determination

Provides guidance for operations, inspection, and maintenance activities based on the operational status of a pipeline. This establishes:

- four statuses: precommissioned, active/in-service, idled, and abandoned;
- operations, inspections, and maintenance recommendations for various pipeline operational statuses;
- pipeline status documentation requirements;
- recommendations regarding safe transition between pipeline statuses.

For the purposes of this document, the word "pipeline" refers to transmission and regulated gathering pipelines and pipeline systems, although the principles may be applied to nonregulated gathering and flow lines. Pages: 17

1st Edition | October 2019 | Product Number: D11811 | Price: $79.00

RP 1182
Construction, Operation, and Maintenance of Large Diameter Rural Gas Gathering Lines

Contains provisions relating to the design, construction, testing, corrosion control, operation, and maintenance of onshore gas gathering lines as defined in API 80. The requirements in the RP are applicable to pipeline > 12.75 in. outside diameter in Class 1 locations (3.1.4) or Class 2 locations (3.1.5) that are not regulated onshore gas gathering lines as defined in 49 *CFR* 192.8. Pages: 30

1st Edition | March 2020| Product Number: D11821 | Price: $79.00

RP 1183
Assessment and Management of Pipeline Dents
(includes Errata 1 dated January 2021 and Addendum 1 dated May 2024)

Applicable to any pipeline system used to transport hazardous liquid or natural gas. This RP includes detailed technical discussion on dent formation, strain and fatigue, and failure modes and mechanisms. These details are provided to give pipeline operators the information and knowledge necessary to make informed integrity management decisions regarding the management of dents on their systems. This RP describes preventive and mitigative measures that pipeline operators can apply to manage dents after detection. The in-service response of dents to a range of loading conditions is discussed in detail. Pages: 138

1st Edition | November 2020 | Product Number: D11831 | Price: $214.00

RP 1184
Pipeline Facilities Construction Inspection

Covers the basic requirements needed to perform inspection activities safely and effectively during onshore transmission pipeline facility construction. Areas of specialty inspection are noted and are beyond the scope of this document. This content can be applied to construction associated with existing facilities. This recommended practice is not intended to be fully comprehensive of all systems that may be located within a pipeline transportation facility. Users of this recommended practice include operators and those individuals either engaged in facility construction inspection or seeking to become certified inspectors. Operators and facility pipeline inspection service companies may also use this document to develop their inspection processes and responsibilities for inspectors, and to develop and enhance their inspector training programs. This recommended practice was based on *The Practical Guide for Facilities Construction Inspectors*, developed in partnership by the INGAA Foundation and the CEPA Foundation, and supports United Nations Sustainable Development Goal 9 for resilient infrastructure. Pages: 183

1st Edition | October 2021 | Product Number: D11841 | Price: $165.00

RP 1185 ■
Pipeline Public Engagement

Provides guidance to hazardous liquids and gas transmission and gathering pipeline operators, the general public, stakeholders, governments, and rights holders for effective stakeholder engagement. The goal of this document is to provide pipeline operators with a scalable and flexible framework to review an existing engagement program or develop and implement a new one. Developing or improving a program can enhance the effectiveness of engagement. The RP also provides guidance on operationalizing environmental justice in pipeline public engagement practices. Pages: 65

1st Edition | March 2024 | Product Number: D118501 | Price: $144.00

RP 1187 ■
Pipeline Integrity Management of Landslide Hazards

Provides recommendations for the management of landslide hazards for operating onshore welded steel pipelines. Landslide hazard management may include both consideration of active features and anticipating or avoiding features such as in design processes, route selection, and/or planning of mitigative measures. Pages: 127

1st Edition | August 2024 | Product Number: G118701 | Price: $160.00

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RP 1188
Hazardous Liquid Pipeline Facilities Integrity Management
(includes Addendum 1 dated December 2023)

Covers the integrity management of hazardous liquid pipeline facilities. This RP provides guidance on high-consequence area impact determinations; data integration; threat identification; risk assessment; inspection and reinspection; preventive and mitigative measures (P&MM); and performance measures. Facilities include terminal and pipeline station piping systems within terminal and pipeline facility boundaries and includes off-plot piping. Off-plot piping includes, but is not limited to, piping between facilities, piping that comes from or goes to a refinery or other type facility, or piping that may cross a road, ditch, or other property outside the confines of a terminal facility. This RP covers the integrity management of all pressure-containing components directly used in the transport or storage of hazardous liquids within a liquids pipeline facility. Piping for transportation of hazardous liquids, such as but not limited to crude oil, highly volatile liquids (HVLs), gasoline, diesel, biofuels, lubricating oils, jet fuel, and aviation fuel are covered by the scope of this document. Pages: 51

1st Edition | January 2022 | Product Number: D11881 | Price: $119.00

TR 1190 ■
Crack ILI Response: Maximum Depth and Failure Pressure Ratio

Justifies the failure pressure ratio (FPR) and depth elements of reasonable and prudent crack ILI response criteria, to be applied in combination with other best practices of API 1176 and consideration of advancements in ultrasonic crack ILI technologies and performance. Pages: 19

1st Edition | February 2024 | Product Number: D11901 | Price: $69.00

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
Please order this document from PRCI: https://www.prci.org

Std 1104
Welding of Pipelines and Related Facilities
(includes Errata 1 dated September 2023)

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, and 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. Pages: 174

22nd Edition | July 2021 | Product Number: D110422 | Price: $470.00

Std 1104 *■
Welding of Pipelines and Related Facilities—Chinese
(includes Errata 1 dated September 2023)

Chinese translation of Std 1104.

22nd Edition | July 2021 | Product Number: D110422C | Price: $470.00

Std 1104 *
Welding of Pipelines and Related Facilities—Russian
(includes Errata 1 dated September 2023)

Russian translation of Std 1104.

22nd Edition | July 2021 | Product Number: D110422R | Price: $470.00

TANK TRUCK OPERATIONS

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

8th Edition | January 2003 | Reaffirmed: February 2011
2-Year Extension: January 2018
Product Number: A10048 | Price: $138.00

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RP 1007
Loading and Unloading of MC 306/DOT 406 Cargo Tank Motor Vehicles

Ensuring the safe and efficient loading and delivery of petroleum products to retail service stations and bulk facilities is the primary goal for all companies that transport product. This document is a guideline for use by the truck driver and persons responsible for loading and unloading of MC306/DOT406 cargo tanks. It identifies specific steps to ensure that product can be loaded into tank trucks and unloaded into both underground and aboveground storage tanks in a safe and efficient manner that protects the environment. It is intended to be used in conjunction with existing driver training programs and procedures. Pages: 24

1st Edition | March 2001 | Reaffirmed: February 2011
2-Year Extension: January 2018
Product Number: A10071 | Price: $42.00

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

Provides minimum guidelines for developing an emergency response plan for incidents involving hazardous liquid hydrocarbons, such as gasoline and crude oil, transported in MC 306/DOT 406 and MC 307/DOT 407 aluminum cargo tanks, and for coordinating and cooperating with local, state, and federal officials. Covers response plan priorities, personnel training, special equipment, media relations, environmental relations, and post-response activities. The appendixes outline a highway emergency response plan and suggest a procedure for removing liquid hydrocarbons from overturned cargo tanks and righting the tank vehicles. Pages: 21

3rd Edition | November 1997 | Reaffirmed: February 2011
2-Year Extension: January 2018
Product Number: A11123 | Price: $82.00

SECURITY

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 | Reaffirmed: February 2022
Product Number: K78001 | Price: $236.00

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 supersede the requirements of any regulated facility but may be used as a reference document. Pages: 82

1st Edition | September 2016 | Product Number: K78101 | Price: $180.00

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INSPECTION OF REFINERY EQUIPMENT

API 510 ◆

Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration
(includes Errata 1 dated March 2023)

Covers the in-service inspection, repair, alteration, and rerating activities for pressure vessels and the pressure-relieving devices (PRDs) protecting these vessels. This inspection code applies to all hydrocarbon and chemical process vessels that have been placed in service; however, it could also be applied to process vessels in other industries at owner-operator discretion. This includes: vessels constructed in accordance with an applicable construction code [e.g., ASME *Boiler and Pressure Vessel Code* (*BPVC*)]; where a pressure vessel has been constructed to the American Society of Mechanical Engineers (ASME) Section VIII Code, API 510 is intended to apply to Divisions 1 and 2 and not Division 3; vessels constructed without a construction code (noncode vessels); vessels constructed and approved as jurisdictional special based upon jurisdiction acceptance of particular design, fabrication, inspection, testing, and installation; nonstandard vessels. Pages: 83

11th Edition | October 2022 | Product Number: C51011 | Price: $307.00

API 510 *■

Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration—Japanese
(includes Errata 1 dated March 2023)

Japanese translation of API 510.

11th Edition | October 2022 | Product Number: C51011J | Price: $307.00

API 570 ◆■

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

Covers inspection, rating, repair, and alteration procedures for metallic piping systems and their associated pressure-relieving devices (PRDs) that have been placed in-service. The intent of this code is to specify the in-service inspection and condition-monitoring program, as well as repair guidance that is needed to determine and maintain the ongoing integrity of piping systems. Pages: 88

5th Edition | February 2024 | Product Number: C57005 | Price: $229.00

RP 571 ◆

Damage Mechanisms Affecting Fixed Equipment in the Refining Industry

Provides background information on damage that can occur to equipment in the refining process. It is intended to supplement Risk-Based Inspection (RP 580 and Publ 581) and Fitness-for-Service (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: 376

3rd Edition | March 2020 | Product Number: C57103 | Price: $450.00

RP 571 *■

Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Chinese

Chinese translation of RP 571.

3rd Edition | March 2020 | Product Number: C57103C | Price: $450.00

RP 571 *■

Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Japanese

Japanese translation of RP 571.

3rd Edition | March 2020 | Product Number: C57103J | Price: $450.00

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. It describes inspection practices for the various types of pressure vessels (e.g. towers, exchanger, air-cooled heat exchanger, reactors, and spheres) used in the hydrocarbon and chemical process industry. This recommended practice addresses vessel components, inspection planning processes, inspection intervals, methods of inspection and assessment, methods of repair, records, and reports. Pages: 163

5th Edition | November 2023 | Product Number: C57205 | Price: $292.00

RP 573 ◆

Inspection of Fired Boilers and Heaters

Covers 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: 129

4th Edition | January 2021 | Product Number: C57304 | Price: $195.00

RP 574 ◆■

Inspection Practices for Piping System Components

Supplements API 570 by providing piping inspectors with information that can improve their skills and increase their 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. Pages: 141

5th Edition | February 2024 | Product Number: C57405 | Price: $266.00

RP 575 ◆■

Inspection Practices for Atmospheric and Low-Pressure Storage Tanks

Provides useful information and recommended practices for the maintenance and inspection of atmospheric and low-pressure storage tanks. Although these maintenance and inspection guidelines may apply to other types of tanks, these practices are intended primarily for existing tanks that were designed and constructed to API aboveground storage tank standards or specifications. This recommended practice is intended to supplement API 653 (applicable for all tanks) and API 12R1 (as applicable for the API 12 series tanks storing production liquids) that provide minimum requirements for maintaining the integrity of storage tanks after they have been placed in service. Pages: 118

5th Edition | September 2024 | Product Number: C57505 | Price: $265.00

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RP 576 ◆■
Inspection of Pressure-Relieving Devices

Describes the inspection and repair practices for self-actuated pressure-relieving devices commonly used in the oil/gas and petrochemical industries. As a guide to the inspection and repair of these devices in the owner-operator's plant, it is intended to ensure their proper performance. This publication covers self-actuated devices such as direct-acting spring-loaded valves, pilot-operated pressure-relief valves, rupture disks, pin-actuated devices, and weight-loaded pressure vacuum vents. Pages: 85

5th Edition | September 2024 | Product Number: C57605 | Price: $266.00

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: 194

3rd Edition | October 2020 | Product Number: C57703 | Price: $308.00

RP 578 ◆
Material Verification Program for New and Existing Assets

Provides recommended practices for an owner/operator to develop and implement a material verification program (MVP) as part of an asset integrity program. The MVP uses positive material identification (PMI) and other testing and administrative methods to verify that the nominal composition of an asset, an asset component, or weldment (or any other tested item) is consistent with the selected or specified construction materials. A well-designed and well-implemented MVP is an important management system used to minimize the potential for release of hazardous substances due to nonconforming materials of construction. Pages: 28

4th Edition | February 2023 | Product Number: C57804 | Price: $242.00

API 579-1/ASME FFS-1
Fitness-For-Service

Provides guidance for conducting fitness-for-service assessments using methodologies specifically prepared for pressurized equipment. Fitness-for-service assessments are quantitative engineering evaluations that are performed to demonstrate the structural integrity of in-service components that may contain a flaw or damage, or that may be operating under a specific condition that might cause a failure. 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 fitness-for-service assessments are currently recognized and referenced by API codes and standards (510, 570, and 653), and by NB-23 (National Board Inspection Code) as suitable means for evaluating the structural integrity of pressure vessels, piping systems, and storage tanks where inspection has revealed some level of degradation and/or flaws in the equipment. Pages: 1478

4th Edition | December 2021
Product Number: C57904| Price: $1,460.00

API 579-2/ASME PTB-14-2023 ■
Fitness-For-Service Example Problems Manual

Supersedes API 579-2, 1st Edition/ASME FFS-2, which has been redesignated by ASME as ASME PTB-14. It is provided to illustrate the calculations used in the assessment procedures in API 579-1/ASME FFS-1, which was published in December 2021. Pages: 664

2nd Edition | May 2024 | Product Number: C57922 | Price: $224.00

RP 580 ◆
Elements of a Risk-Based Inspection Program

Provides users with the basic minimum and recommended elements for developing, implementing, and maintaining a risk-based inspection (RBI) program. It also provides guidance to owner-users, operators, and designers of pressure-containing equipment for developing and implementing an inspection program. These guidelines include means for assessing an inspection program and its plan. The approach emphasizes safe and reliable operation through risk-prioritized inspection. A spectrum of complementary risk analysis approaches (qualitative through fully quantitative) can be considered as part of the inspection planning process. RBI guideline issues covered include an introduction to the concepts and principles of RBI for risk management; and individual sections that describe the steps in applying these principles within the framework of the RBI process. Pages: 99

4th Edition | August 2023 | Product Number: C58004 | Price: $363.00

RP 581
Risk-Based Inspection Methodology
(includes Addendum 1 dated April 2019 and Addendum 2 dated October 2020)

Provides quantitative procedures to establish an inspection program using risk-based methods for pressurized fixed equipment including pressure vessel, 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: $1,007.00

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

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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-retaining equipment; tanks and attachment welds; nonremovable internals for process equipment; structural items attached and related to process equipment; and other equipment or component items when referenced by an applicable purchase document. Pages: 78

4th Edition | May 2023 | Product Number: C58204 | Price: $166.00

RP 583 ◆
Corrosion Under Insulation and Fireproofing

Covers 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. Pages: 106

2nd Edition | March 2021 | Product Number: C58302 | Price: $231.00

RP 583 *■
Corrosion Under Insulation and Fireproofing—Japanese

Japanese translation of RP 583.

2nd Edition | March 2021 | Product Number: C58302J | Price: $231.00

RP 584 ◆
Integrity Operating Windows

Explains the importance of integrity operating windows (IOWs) for process safety management and to guide users in how to establish and implement an IOW program for process facilities. It is the intent of the document to provide the user with information and guidance on the work process for the development and implementation of IOWs to help strengthen the mechanical integrity (MI) program for each process unit. This edition includes a new Annex D, Barriers to Successful IOW Implementation, as a way to assist in improving industry safety and sustainability. Pages: 69

2nd Edition | December 2021 | Product Number: C58402 | Price: $160.00

RP 585 ◆
Pressure Equipment Integrity Incident Investigation

Provides owner-operators with practices for developing, implementing, sustaining, and enhancing an investigation program for pressure equipment integrity (PEI) incidents. This document describes characteristics of how an effective investigation could be structured so organizations can learn from PEI failures, near-misses, or discoveries. Pages: 52

2nd Edition | April 2021 | Product Number: C58502 | Price: $170.00

Bull 587
Guidance for the Development of Ultrasonic Examiner Qualification Programs

Provides owner/users with guidelines for developing basic in-house qualification programs to identify industry-qualified UT angle beam examiners that are equivalent to those possessing an ultrasonic angle beam qualification from API (e.g. API QUTE/QUSE Detection and Sizing Tests) for inspection of pressure equipment and piping as required by API 510 and API 570. The availability of high-quality and accurate ultrasonic testing (UT) data is often the cornerstone for weld and base metal discontinuities detection and sizing for equipment integrity assessments. As a result, API has implemented several certification programs to assist in defining the minimum criteria for assessing the performance of UT technicians. Pages: 31

1st Edition | May 2021 | Product Number: C58701 | Price: $108.00

RP 588
Recommended Practice for Source Inspection and Quality Surveillance of Fixed Equipment

Summarizes the basic body of knowledge that the source inspector typically needs to know to perform as a source inspector for fixed equipment. A secondary purpose is to assist candidates intending to take the API Source Inspection Examination to become certified source inspectors. This recommended practice (RP) outlines the fundamentals of source inspection and may be useful to all personnel conducting such activities to perform their jobs in a competent and ethical manner.

This RP covers the process of specifying the necessary quality surveillance of materials, equipment, and fabrications being supplied for use in the oil, petrochemical, and gas Industry, including upstream, midstream, and downstream segments. This RP may be used as the basis for providing a systematic approach to risk-based source inspection in order to provide confidence that materials and equipment being purchased meet the minimum requirements as specified in the project documents and contractual agreements. Pages: 72

1st Edition | July 2019 | Product Number: C58801 | Price: $212.00

Std 653 ◆
Tank Inspection, Repair, Alteration, and Reconstruction
(includes Addendum 1 dated April 2018, Addendum 2 dated May 2020, Addendum 3 dated November 2023, and Errata 1 dated March 2020)

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

5th Edition | November 2014 | Product Number: C65305 | Price: $293.00

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Std 653 *
Tank Inspection, Repair, Alteration, and Reconstruction—Chinese
(includes Addendum 1 dated April 2018, Addendum 2 dated May 2020, Addendum 3 dated November 2023, and Errata 1 dated March 2020)

Chinese translation of Std 653.

5th Edition | November 2014 | Product Number: C65305C | Price: $293.00

Std 653 *
Tank Inspection, Repair, Alteration, and Reconstruction—Portuguese
(includes Addendum 1 dated April 2018, Addendum 2 dated May 2020, Addendum 3 dated November 2023, and Errata 1 dated March 2020)

Portuguese translation of Std 653.

5th Edition | November 2014 | Product Number: C65305P | Price: $293.00

MECHANICAL EQUIPMENT STANDARDS FOR REFINERY SERVICE

Std 610
Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries

Specifies requirements for centrifugal pumps, including pumps running in reverse as hydraulic power recovery turbines, for use in petroleum, petrochemical, and gas industry process services. This document is applicable to overhung pumps, between bearings pumps, and vertically suspended pumps. This document also provides requirements applicable to specific types of pumps. Illustrations are provided of the various specific pump types and the designations assigned to each specific pump type. Pages: 233

12th Edition | January 2021 | Product Number: C61012 | Price: $200.00

Std 611
General-Purpose Steam Turbines for Petroleum, Chemical, and Gas Industry Services

Covers the minimum requirements for general-purpose steam turbines. These requirements include basic design, materials, related lubrication systems, controls, auxiliary equipment, and accessories for use in the petroleum, chemical, and gas industry services. This standard includes only general-purpose turbines. General-purpose turbines are horizontal or vertical turbines used to drive equipment that is usually spared or is in noncritical service. They are generally used where steam conditions will not exceed a pressure of 48 bar (700 psig) and a temperature of 400 °C (750 °F). Pages: 150

6th Edition | June 2022 | Product Number: C61106 | Price: $200.00

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: 199

8th Edition | November 2020 | Product Number: C61208 | Price: $301.00

Std 613
Special Purpose Gear Units for Petroleum, Chemical and Gas Industry Services
(ANSI/API Std 613)

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. This standard is primarily intended for gear units that are in continuous service without installed spare equipment. Pages: 124

6th Edition | July 2021 | Product Number: C61306 | Price: $288.00

Std 614
Lubrication, Shaft-Sealing, and Control-Oil Systems and Auxiliaries

Covers the minimum requirements for lubrication systems, oil-type shaft-sealing systems, oil-control systems, and auxiliaries, excluding dry gas seal systems and fuel systems. These systems can serve individual equipment such as compressors, gears, pumps, and drivers or complete trains. Pages: 246

6th Edition | February 2022 | Product Number: CX61405 | Price: $402.00

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 is either discussed directly in this standard or referred to in this standard through references to other publications. Specifically, gas turbine units that are capable of firing gas or liquid or both are covered by this standard. This standard covers both industrial and aeroderivative gas turbines. Pages: 286

6th Edition | September 2022 | Product Number: C61606 | Price: $280.00

Std 617
Axial and Centrifugal Compressors and Expander-Compressors

Specifies minimum requirements and gives recommendations for axial compressors, single-shaft and integrally geared process centrifugal compressors, and expander-compressors for special-purpose applications that handle gas or process air in the petroleum, chemical, and gas industries. Pages: 348

9th Edition | April 2022 | Product Number: C61709 | Price: $328.00

Std 618 ■
Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services

Covers the minimum requirements for reciprocating compressors and their drivers for use 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 low- to moderate-speed machines. Also included are related lubrication systems, controls, instrumentation, intercoolers, aftercoolers, pulsation suppression devices, and other auxiliary equipment. Pages: 190

6th Edition | May 2024 | Product Number: C61806 | Price: $229.00

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Std 619/ISO 10440-1:2007
Rotary-Type Positive Displacement Compressors for Petroleum, Petrochemical and Natural Gas Industries
(includes Errata 1 to datasheets dated August 2018)

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 | Reaffirmed: January 2023
Product Number: CX61905 | Price: $268.00

Std 619/ISO 10440-1:2007 *
Rotary-Type Positive Displacement Compressors for Petroleum, Petrochemical and Natural Gas Industries—Russian
(includes Errata 1 to datasheets dated August 2018)

Russian translation of Std 619/ISO 10440-1:2007.

5th Edition | December 2010 | Reaffirmed: January 2023
Product Number: CX61905R | Price: $268.00

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

5th Edition | November 2014 | Reaffirmed: May 2022
Product Number: C67005 | Price: $243.00

Std 670 *
Machinery Protection Systems—Russian

Russian translation of Std 670.

5th Edition | November 2014 | Product Number: C67005R | Price: $243.00

Std 671
Special Purpose Couplings for Petroleum, Chemical, and Gas Industry Services
(includes Errata 1 dated June 2024)

Specifies the requirements for couplings for the transmission of power between the rotating shafts of two machines in special-purpose applications in the petroleum, petrochemical and natural gas industries. Such applications are typically in large and/or high speed machines, in services that can be required to operate continuously for extended periods, are often unspared and are critical to the continued operation of the installation. By agreement, it can be used for other applications or services.

Couplings covered are designed to accommodate parallel (or lateral) offset, angular misalignment and axial displacement of the shafts without imposing unacceptable mechanical loading on the coupled machines. It is applicable to gear, metallic flexible element, quill shaft and torsionally resilient type couplings. Torsional damping and resilient type couplings are detailed in Annex A; gear-type couplings are detailed in Annex B and quill shaft style coupling are detailed in Annex C. Also covers the design, materials of construction, manufacturing quality, inspection and testing special purpose couplings. Pages: 103

5th Edition | August 2020 | Product Number: C67105 | Price: $291.00

Std 672
Packaged, Integrally Geared Centrifugal Air Compressors for Petroleum, Chemical, and Gas Industry Services

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: 125

5th Edition | August 2019 | Product Number: C67205 | Price: $379.00

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: $212.00

Std 673 *
Centrifugal Fans for Petroleum, Chemical, and Gas Industry Services—Russian

Russian translation of Std 673.

3rd Edition | December 2014
Product Number: C67303R | Price: $212.00

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

3rd Edition | December 2010 | Reaffirmed: November 2016
2-Year Extension: November 2015
Product Number: C67403 | Price: $231.00

Std 674 *
Positive Displacement Pumps—Reciprocating—Russian
(includes Errata 1 dated May 2014 and Errata 2 dated April 2015)

Russian translation of Std 674.

3rd Edition | December 2010 | Reaffirmed: November 2016
Product Number: C67403R | Price: $231.00

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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 plunger design. Rotary positive displacement pumps are not included. Diaphragm pumps that use direct mechanical actuation are also excluded.

NOTE See Std 674 for positive displacement reciprocating pumps and Std 670 for positive displacement rotary pumps.

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 | Reaffirmed: July 2021
Product Number: C67503 | Price: $158.00

Std 675 *
Positive Displacement Pumps—Controlled Volume for Petroleum, Chemical, and Gas Industry Services—Russian
(includes Errata 1 dated June 2014 and Errata 2 dated April 2015)

Russian translation of Std 675.

3rd Edition | November 2012 | Reaffirmed: July 2021
Product Number: C67503R | Price: $158.00

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: 101

4th Edition | February 2022 | Product Number: C67604 | Price: $204.00

Std 677
General-Purpose, Extruder, and Epicyclic Gear Units for Petroleum, Chemical, and Gas Industry Services

Covers the minimum requirements for general-purpose, enclosed single and multistage gear units incorporating parallel shaft spur, and helical gears for use in the petroleum, chemical, and gas industry services. General-purpose and extruder gears manufactured according to this standard are limited to pitch line velocities that do not exceed 60 m/s (12,000 ft/min). Pages: 188

4th Edition | September 2021 | Product Number: C67704 | Price: $223.00

Std 681
Liquid Ring Compressors and Vacuum Pumps in 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: 151

2nd Edition | July 2021 | Product Number: C68102 | Price: $200.00

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, 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 | Reaffirmed: May 2022
Product Number: C68204 | Price: $317.00

Std 682 *
Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps—Chinese

Chinese translation of Std 682.

4th Edition | May 2014 | Reaffirmed: May 2022
Product Number: C68204C | Price: $317.00

Std 682 *
Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps—Russian

Russian translation of Std 682.

4th Edition | May 2014 | Reaffirmed: May 2022
Product Number: C68204R | Price: $317.00

TR 684-1
API Standard Paragraphs Rotordynamic Tutorial: Lateral Critical Speeds, Unbalance Response, Stability, Train Torsionals, and Rotor Balancing

Describes, discusses, and clarifies the section of the API Standard Paragraphs that outlines the complete rotordynamics acceptance program. The acceptance program was designed by API to ensure mechanical reliability of equipment. This document is an introduction to the major aspects of rotating equipment vibrations that are addressed during a typical lateral dynamics analysis. Pages: 538

1st Edition | November 2019 | Product Number: C684101 | Price: $296.00

Std 685
Sealless Centrifugal Pumps for Petroleum, Petrochemical, and Gas Industry Process Service

Covers the minimum requirements for sealless centrifugal pumps for use in petroleum, heavy-duty petrochemical, and gas industry services. It is applicable to single-stage overhung pumps of two classifications, magnetic drive pumps (MDPs) and canned motor pumps (CMPs). Sections 2 through 8 and Section 10 cover requirements applicable to both classifications. Section 9 is divided into two subsections and covers requirements unique to each classification. Pages: 197

3rd Edition | July 2022 | Product Number: C68503 | Price: $280.00

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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

2nd Edition | December 2009 | Reaffirmed: July 2024
Product Number: C68602 | Price: $232.00

RP 687
Special-Purpose Rotating Equipment Repairs
(includes Errata 1 dated May 2024)

Covers the recommendations for the inspection and repair of special-purpose rotating equipment assemblies and components (rotors, bearings, couplings, and stationary components) used in petroleum, chemical, and gas industry services. Pages: 671

2nd Edition | October 2023 | Product Number: C68702 | Price: $345.00

Std 688
Pulsation and Vibration Control for Positive Displacement Machinery Systems for Petroleum, Chemical, and Natural Gas Industry Services
(includes Errata 1 dated March 2024)

Covers the minimum requirements for pulsation and vibration control for positive displacement (PD) machinery systems used in the petroleum, chemical, and natural gas industry services. The specific machinery addressed includes reciprocating compressors; rotary-type PD compressors; PD pumps—reciprocating; PD pumps—controlled volume; and PD pumps—rotary. Pages 157

2nd Edition | October 2023 | Product Number: C68802 | Price: $200.00

RP 691
Risk-Based Machinery Management

Defines the minimum requirements for the management of health, safety, and environmental (HSE) risks across the machinery life cycle. It shall be applied to the subset of operating-company- and/or vendor-defined high-risk machinery. Pages: 198

1st Edition | June 2017 | Product Number: C69101 | Price: $202.00

Std 692
Dry Gas Sealing Systems for Axial, Centrifugal, and Rotary Screw Compressors and Expanders

Covers the minimum dry gas sealing system requirements in association with axial, centrifugal, and rotary screw compressors and expanders for use in the petroleum, chemical, and gas industry services as described in API 617 and API 619. Pages: 258

1st Edition | June 2018 | Product Number: C69201 | Price: $204.00

RP 697
Pump Repair

Covers the minimum recommendations for the inspection and repair of API 610 pumps types OH1 through OH5 and BB1 through BB5. This document covers the entire process of field inspection, modifications, inspection, upgrades, repair and/or new component manufacturer, reassembly of the pump casing and rotor in the shop, and the reinstallation and start-up of the pump in the field. Pages 750

2nd Edition | April 2023 | Product Number: C69701 | Price: $362.00

EQUIPMENT DATASHEETS

Electronically formatted mechanical equipment standards datasheets are now available in electronic format (Excel spreadsheets):

All of the following datasheets are available for single user at $65.00 each or for intranet licensing at $317.00 each.

Std 610, 12th Edition	Std 619, 5th Edition	Std 673, 3rd Edition
Std 611, 6th Edition	Std 660, 9th Edition	Std 674, 3rd Edition
Std 612, 8th Edition	Std 661, 7th Edition	Std 675, 3rd Edition
Std 613, 6th Edition	Std 663, 2nd Edition	Std 676, 4th Edition
Std 614, 6th Edition	Std 664, 1st Edition	Std 677, 4th Edition
Std 616, 6th Edition	Std 670, 5th Edition	Std 681, 2nd Edition
Std 617, 9th Edition	Std 671, 5th Edition	Std 682, 4th Edition
Std 618, 5th Edition	Std 672, 5th Edition	Std 685, 3rd Edition

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Electronic versions of the residual unbalance worksheets that appear in mechanical equipment standards (Excel) along with instructions (Word).

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STORAGE TANKS

Impact of Gasoline Blended with Ethanol on the Long-Term Structural Integrity of Liquid Petroleum Storage Systems and Components

Summarizes the results of a literature review conducted for 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: $71.00
Appendix A—Literature Review | Price $138.00

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Spec 12B ◆
Specification for Bolted Tanks for Storage of Production Liquids
(includes Errata 1 dated November 2024)

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 with internal pressures approximating atmospheric pressure. 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. Pages: 30

17th Edition | December 2020
Product Number: G12B17 | Price: $164.00

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

Covers material, design, fabrication, and testing requirements for vertical, cylindrical, aboveground, closed top, welded steel storage tanks with internal pressures approximately atmospheric at various sizes and capacities ranging from 500 to 10,000 barrels. This specification is designed to provide the oil production industry with tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. This specification is for the convenience of purchasers and manufacturers in ordering and fabricating tanks. Pages: 29

12th Edition | June 2017 | Effective Date: December 1, 2017
Product Number: G12D12 | Price: $132.00

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

Covers new shop-fabricated vertical, cylindrical, aboveground, welded steel storage tanks in the standard sizes and capacities. It defines the material, design, fabrication, and testing requirements, as well as identifying the acceptable internal pressures given in Table 1. This specification is designed to provide the oil production industry with tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. This specification is for the convenience of purchasers and manufacturers in ordering and fabricating tanks. Pages: 37

14th Edition | October 2024 | Effective Date: April 30, 2025
Product Number: G12F14 | Price: $186.00

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: $148.00

Std 12R1
Installation, Operation, Maintenance, Inspection, and Repair of Tanks in Production Service
(includes Addendum 1 dated June 2021)

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: 53

6th Edition | March 2020 | Product Number: G12R16 | Price: $190.00

Std 620
Design and Construction of Large, Welded, Low-Pressure Storage Tanks
(includes Addendum 1 dated November 2014, Addendum 2 dated April 2018, and Addendum 3 dated September 2021)

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 revolution, 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: 288

12th Edition | October 2013 | Product Number: C62012 | Price: $540.00

Std 620 *
Design and Construction of Large, Welded, Low-Pressure Storage Tanks—Chinese
(includes Addendum 1 dated November 2014, Addendum 2 dated April 2018, and Addendum 3 dated September 2021)

Chinese translation of Std 620.

12th Edition | October 2013 | Product Number: C62012C | Price: $540.00

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Std 625
Tank Systems for Refrigerated Liquefied Gas Storage
(includes Addendum 1 dated July 2013, Addendum 2 dated November 2014, Addendum 3 dated June 2018, and Addendum 4 dated September 2021)

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. Stored product 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: $289.00

Std 650 ◆
Welded Tanks for Oil Storage
(includes Errata 1 dated January 2021)

Establishes minimum requirements for material, design, fabrication, erection, and testing for vertical, cylindrical, aboveground, closed- and open-top, welded carbon, or stainless steel storage tanks in various sizes and capacities for internal pressures approximating atmospheric pressure (internal pressures not exceeding the weight of the roof plates), but a higher internal pressure is permitted when addition requirements are met. This standard applies only to tanks whose entire bottom is uniformly supported and to tanks in non-refrigerated service that have a maximum design temperature of 93 °C (200 °F) or less. Pages: 514

13th Edition | March 2020 | Product Number: C65013 | Price: $682.00

RP 651 ◆■
Cathodic Protection of Aboveground Petroleum Storage Tanks

Presents procedures and practices for achieving effective corrosion control on aboveground storage tank bottoms through the use of cathodic protection. This RP contains provisions for the application of cathodic protection to existing and new aboveground storage tanks. Corrosion control methods based on chemical control of the environment or the use of protective coatings are not covered in detail. When cathodic protection is used for aboveground storage tank applications, it is the intent of this RP to provide information and guidance specific to aboveground metallic storage tanks in hydrocarbon service. Certain practices recommended herein may also be applicable to tanks in other services. Pages: 60

5th Edition | August 2024 | Product Number: G65105| Price: $160.00

RP 652 ◆
Linings of Aboveground Petroleum Storage Tank Bottoms

Provides guidance on achieving effective corrosion control by the application of tank bottom linings in aboveground storage tanks in hydrocarbon service. It contains information pertinent to the selection of lining materials, surface preparation, lining application, cure, and inspection of tank bottom linings for existing and new storage tanks. In many cases, tank bottom linings have proven to be an effective method of preventing internal corrosion of steel tank bottoms.

Provides information and guidance specific to aboveground steel storage tanks in hydrocarbon service. Certain practices recommended herein may also applicable to tanks in other services. This recommended practice is intended to serve only as a guide and detailed tank bottom lining specifications are not included.

This recommended practice does not designate specific tank bottom linings for every situation because of the wide variety of service environments. Pages: 40

5th Edition | May 2020 | Product Number: C65205 | Price: $187.00

Std 653 ◆
Tank Inspection, Repair, Alteration, and Reconstruction
(includes Addendum 1 dated April 2018, Addendum 2 dated May 2020, and Errata 1 dated March 2020)

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

5th Edition | November 2014 | Product Number: C65305 | Price: $293.00

Std 653 *
Tank Inspection, Repair, Alteration, and Reconstruction—Chinese
(includes Addendum 1 dated April 2018, Addendum 2 dated May 2020, and Errata 1 dated March 2020)

Chinese translation of Std 653.

5th Edition | November 2014 | Product Number: C65305C | Price: $293.00

Std 653 *
Tank Inspection, Repair, Alteration, and Reconstruction—Portuguese
(includes Addendum 1 dated April 2018, Addendum 2 dated May 2020, and Errata 1 dated March 2020)

Portuguese translation of Std 653.

5th Edition | November 2014 | Product Number: C65305P | Price: $293.00

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TR 654
Aboveground Storage Tank Caulking or Sealing the Bottom Edge Projection to the Foundation

Provides guidance to owner/operators that have tanks that are set on a foundation system with the goal to protect the asset from deterioration by minimizing corrosion and foundation deterioration and allowing for proper support of the tank shell. The asset includes the tank itself, as well as the foundation system.

This document does not require that caulking or sealants be installed at the bottom edge projection and the foundation of aboveground storage tanks. It provides guidance in situations in which caulking or sealants may be advantageous and should be considered.

This technical report applies to situations where an owner/operator is considering caulk or sealant in this area, or if any regulatory agency requires or recommends that an owner/operator installs some type of caulk or sealant. This document will also consider how to inspect existing caulk and sealant, including maintenance procedures, and includes a suggested inspection schedule. Pages: 23

1st Edition | May 2019 | Product Number: C65401 | Price: $140.00

TR 655
Vapor Corrosion Inhibitors for Storage Tanks

Provides details on utilizing vapor corrosion inhibitors (VCIs) for protection of the soil side of tank bottoms. Pages: 28

1st Edition | April 2021 | Product Number: C65501 | Price: $82.00

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: $146.00

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: $133.00

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: $199.00

Std 2015 ◆ ■
Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks

Applies to stationary atmospheric low-pressure [up to and including 103 kPA (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. Pages: 152

9th Edition | August 2024 | Product Number: K201509 | Price: $293.00

RP 2026 ◆
Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service

Addresses the hazards associated with access/egress onto external and internal floating roofs of in-service petroleum storage tanks and identifies some of the most common practices and procedures for safely accomplishing this activity. This RP is intended primarily for those persons who are required to perform inspection, service, maintenance, or repair activities that involve descent onto floating roofs of in-service petroleum tanks. Pages: 28

4th Edition | July 2022 | Product Number: K202604 | Price: $126.00

RP 2027 ■
Ignition Hazards and Safe Work Practices for Abrasive Blasting of Atmospheric Storage Tanks in Hydrocarbon Service

Provides safe work practices for the prevention and control of vapor, ignition, and other potential hazards during abrasive blasting of aboveground storage tanks in liquid hydrocarbon service at atmospheric pressure. It is generally recognized in the petroleum industry that the preferable method is to empty, vapor-free, and clean aboveground petroleum storage tanks before starting abrasive blasting work. However, this may not be practical or even possible and may increase the risk of an undesirable hazard or incident in some situations. It is, therefore, necessary to understand the potential ignition and safety hazards when planning abrasive blasting and to implement the appropriate safeguards before starting this work. Pages: 27

5th Edition | September 2024
Product Number: C202705 | Price: $162.00

RP 2207 ◆
Preparing Tank Bottoms for Hot Work

Addresses only the safety aspects of hot work performed 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. RP 2009 provides more in-depth information on safe hot work practices, and its requirements are not duplicated here. Pages: 28

8th Edition | April 2022 | Product Number: K22078 | Price: $140.00

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: 52

9th Edition | August 2020 | Product Number: C25109 | Price: $151.00

■ This publication is a new entry in this catalog.

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

Std 2610
Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities

Guides the management of terminals and tanks in a manner that protects the environment and the safety of workers and the public. This standard is intended for petroleum terminal and tank facilities associated with marketing, refining, pipeline, and other similar facilities. This standard may be used as a resource and management guide by those responsible for such facilities and by those working on their behalf. This standard is a compilation of industry knowledge, information, and management practices for all relevant aspects of terminal and tank operations aggregated into an overview document comprising best practices. Pages: 100

3rd Edition | September 2018 | Product Number: C26103 | Price: $222.00

PRESSURE-RELIEVING SYSTEMS FOR REFINERY SERVICE

Std 520, Part I
Sizing, Selection, and Installation of Pressure-Relieving Devices—Part I—Sizing and Selection
(includes Errata 1 dated May 2023)

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: 172

10th Edition | October 2020 | Product Number: C520110 | Price: $463.00

Std 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: 69

7th Edition | October 2020 | Product Number: C5200207 | Price: $355.00

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: 247

7th Edition | June 2020 | Product Number: C52107 | Price: $395.00

TR 522
Technical Report on Pressure-Relief System Calculations
(includes Errata 1 dated October 2023)

Provides equations and examples for performing relief system calculations. Users are responsible for performing their own calculations and using appropriate references for equations. This report contains a variety of calculation examples for equations and methods found in API publications on pressure-relief systems. Pages: 22

1st Edition | April 2022 | Product Number: C52201 | Price: $75.00

Std 526
Flanged Steel Pressure-Relief Valves

Purchase specification for flanged steel pressure-relief valves. Basic requirements are given for direct spring-loaded pressure-relief valves and pilot-operated pressure-relief valves as follows: orifice designation and area; valve size and pressure rating, inlet and outlet; materials; pressure-temperature limits; center-to-face dimensions, inlet and outlet. Nameplate nomenclature and requirements for stamping are detailed in Annex A. Pages: 160

8th Edition | August 2023 | Product Number: C52608 | Price: $252.00

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: 13

5th Edition | July 2020 | Product Number: C52705 | Price: $130.00

To purchase individual API standards, visit apiwebstore.org

RP 576 ◆■
Inspection of Pressure-Relieving Devices

Describes the inspection and repair practices for self-actuated pressure-relieving devices commonly used in the oil/gas and petrochemical industries. As a guide to the inspection and repair of these devices in the owner-operator's plant, it is intended to ensure their proper performance. This publication covers self-actuated devices such as direct-acting spring-loaded valves, pilot-operated pressure-relief valves, rupture disks, pin-actuated devices, and weight-loaded pressure vacuum vents. Pages: 85

5th Edition | September 2024 | Product Number: C57605 | Price: $266.00

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 | Reaffirmed: April 2000
Product Number: C20007 | Price: $279.00

PIPING COMPONENT 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 piping systems and their associated pressure-relieving devices (PRDs) that have been placed in-service. The intent of this code is to specify the in-service inspection and condition-monitoring program, as well as repair guidance that is needed to determine and maintain the ongoing integrity of piping systems. Pages: 88

5th Edition | February 2024 | Product Number: C57005 | Price: $229.00

RP 574 ◆■
Inspection Practices for Piping System Components

Supplements API 570 by providing piping inspectors with information that can improve their skills and increase their 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. Pages: 141

5th Edition | February 2024 | Product Number: C57405 | Price: $266.00

RP 578 ◆
Material Verification Program for New and Existing Assets

Provides recommended practices for an owner/operator to develop and implement a material verification program (MVP) as part of an asset integrity program. The MVP uses positive material identification (PMI) and other testing and administrative methods to verify that the nominal composition of an asset, an asset component, or weldment (or any other tested item) is consistent with the selected or specified construction materials. A well-designed and well-implemented MVP is an important management system used to minimize the potential for release of hazardous substances due to nonconforming materials of construction. Pages: 28

4th Edition | February 2023 | Product Number: C57804 | Price: $242.00

RP 591
Process Valve Qualification Procedure

Provides recommendations for evaluation of a manufacturer's valve construction and quality management system for the purpose of determining a manufacturer's capability to provide new valves manufactured in accordance with applicable standards listed. Testing per this recommended practice that does not have an established requirement in the applicable standard is for information only. Pages: 32

6th Edition | April 2019 | Product Number: C59106 | Price: $137.00

Std 594 ◆
Check Valves: Flanged, Lug, Wafer, and Butt-Welding

Covers the design, materials, face-to-face dimensions, pressure-temperature ratings, inspection, examination, and testing requirements for two types of check valves. Pages: 33

9th Edition | February 2022 | Effective Date: August 2022
Product Number: C59409 | Price: $162.00

Std 598
Valve Inspection and Testing

Covers inspection, examination, supplementary examinations, and pressure test requirements for resilient-seated, nonmetallic-seated (e.g. ceramic), and metal-to-metal-seated valves of the gate, globe, plug, ball, check, and butterfly types. This standard supplements the API standards that reference it, but it may also be applied to other types of valves by agreement between the purchaser and the valve manufacturer. See Annex A for information to be specified by the purchaser. Pages: 24

11th Edition | February 2023 | Product Number: C59811 | Price: $116.00

Std 599 ◆
Metal Plug Valves—Flanged, Threaded, and Welding Ends

Covers steel, nickel base, and other alloy plug valves with flanged or butt-welding ends and ductile iron plug valves with flanged ends in sizes NPS $^{1}/_{2}$ through NPS 24 and threaded or socket-welding ends for sizes NPS $^{1}/_{2}$ through NPS 2. Valve bodies conforming to ASME B16.34 may have one flange and one butt-welding end, or one threaded and one socket welding end. Pages: 26

8th Edition | March 2020 | Product Number: C59908 | Price: $132.00

Std 600 ◆
Steel Gate Valves—Flanged and Butt-Welding Ends, Bolted Bonnets (includes Errata 1 dated April 2024)

Specifies the requirements for a heavy-duty series of bolted bonnet steel gate valves for petroleum refinery and related applications where corrosion, erosion, and other service conditions would indicate a need for full port openings, heavy wall sections, and large stem diameters. Pages: 42

14th Edition | May 2021| Product Number: C60014 | Price: $167.00

* 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.

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

To purchase individual API standards, visit apiwebstore.org

Std 602 ◆
Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries

Specifies the requirements for a series of compact gate, globe, and check valves for petroleum and natural gas industry applications. It covers valves of the nominal pipe sizes DN: 8, 10, 15, 20, 25, 32, 40, 50, 65, 80, and 100; corresponding to nominal pipe sizes NPS: 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, and 4; and applies to pressure class designations: 150, 300, 600, 800, and 1500. Pages: 72

11th Edition | May 2022 | Effective Date: November 1, 2022
Product Number: C60211 | Price: $168.00

Std 603 ◆
Corrosion-Resistant, Bolted Bonnet Gate Valves—Flanged and Butt-Welding Ends

Specifies the requirements for corrosion-resistant bolted bonnet gate valves meeting the requirements of ASME B16.34, Standard Class, for valves having flanged or butt-weld ends in sizes NPS ½ through 24, corresponding to nominal pipe sizes in ASME B36.10M, and Classes 150, 300, and 600.

This standard covers the 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: 9

9th Edition | September 2018 | Product Number: C60309 | Price: $118.00

Std 607
Fire Test for Quarter-Turn Valves and Valves Equipped with Nonmetallic Seats

Specifies fire testing requirements and method for confirming the pressure-containing capability of quarter-turn valves with nonmetallic or metallic seat(s) and other operated 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: 26

8th Edition | October 2022 | Product Number: C60708 | Price: $120.00

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 or socket-welding ends for NPS 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: 32

6th Edition | January 2020 | Product Number: C60806 | Price: $155.00

Std 609 ◆
Butterfly Valves: Double-Flanged, Lug- and Wafer-Type, and Butt-Welding Ends

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. Pages: 34

9th Edition | April 2021 | Product Number: C60909 | Price: $130.00

RP 615
Valve Selection Guide

Aids in selection of valves for the hydrocarbon processing industry (HPI) and may also assist in the selection of valves for other industrial processes, such as power or general industry process applications. 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 RP. Pages: 55

3rd Edition | August 2022 | Product Number: C61503 | Price: $119.00

RP 621
Reconditioning of Metallic Gate, Globe, and Check Valves

Provides guidelines for reconditioning heavy wall (API 600 and API 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: 54

5th Edition | October 2022 | Product Number: C62105 | Price: $186.00

Std 622
Type Testing of Process Valve Packing for Fugitive Emissions
(includes Addendum 1 dated March 2022)

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: 37

3rd Edition | October 2018 | Product Number: C62203 | Price: $192.00

Std 623
Steel Globe Valves—Flanged and Butt-Welding Ends, Bolted Bonnets
(includes Errata 1 dated April 2024)

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. Pages: 39

2nd Edition | January 2021 | Product Number: C62302 | Price: $108.00

Std 624
Type Testing of Rising Stem Valves Equipped with Graphite Packing for Fugitive Emissions
(includes Errata 1 dated May 2023)

Specifies the requirements and acceptance criteria (100 ppmv) for fugitive emission type testing of rising and rising-rotating stem valves equipped with packing previously tested in accordance with API 622. Packing shall be suitable for use at service temperatures –29 °C to 538 °C (–20 °F to 1000 °F). The type testing requirements contained herein are based upon elements of EPA Method 21. Valves larger than NPS 24 or valves greater than class 1500 are outside the scope of this standard. Pages: 27

2nd Edition | February 2023 | Product Number: C62402 | Price: $109.00

To purchase individual API standards, visit apiwebstore.org

Std 641
Type Testing of Quarter-Turn Valves for Fugitive Emissions

Specifies the requirements and acceptance criteria for fugitive emission type testing of quarter-turn valves. Valves larger than NPS 60 and valves greater than ASME B16.34 class 1500 are outside the scope of this standard. Valves with a pressure rating at ambient temperature less than 6.89 barg (100 psig) are outside the scope of this standard. For all valves rated greater than or equal to 400 °C (750 °F), an additional high temperature test may be performed in accordance with Annex C or when specified by the purchaser. Pages: 26

2nd Edition | October 2023 | Product Number: C64102 | Price: $97.00

ELECTRICAL INSTALLATIONS AND EQUIPMENT

RP 500
Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1, and Division 2

Provides guidelines for classifying locations Class I, Division 1 and Class I, Division 2 at petroleum facilities for the selection and installation of electrical equipment. Basic definitions given in the 2023 edition of NFPA 70, *National Electrical Code (NEC)*, have been followed in developing this recommended practice. Pages: 183

4th Edition | June 2023 | Product Number: C50004 | Price: $337.00

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

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 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: 177

2nd Edition | August 2018 | Product Number: C50502 | Price: $246.00

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 | Reaffirmed: May 2021
Product Number: C54105 | Price: $236.00

Std 541 *
Form-Wound Squirrel Cage Induction Motors—375 kW (500 Horsepower) and Larger—Russian

Russian translation of Std 541.

5th Edition | December 2014 | Reaffirmed: May 2021
Product Number: C54105R | Price: $236.00

Std 546
Brushless Synchronous Machines—500 kVA and Larger

Covers the minimum requirements for form-wound and bar-wound brushless synchronous machines 500 kVA and larger for use in petroleum, chemical, and other industrial applications. This standard includes synchronous motors and generators with two different rotor designs: salient-pole type rotors with solid or laminated poles; and cylindrical type rotors with solid or laminated construction. Pages: 269

4th Edition | April 2022 | Product Number: C54604 | Price: $258.00

Std 547 ◆
General Purpose Form-Wound Squirrel Cage Induction Motors—185 kW (250 hp) Through 2240 kW (3000 hp)

Covers the requirements for form-wound induction motors for use in general-purpose petroleum, chemical, and other industrial severe duty applications. These motors:

- are rated 250 hp (185 kW) through 3000 hp (2250 kW) for 4, 6, and 8 pole speeds,
- are rated less than 800 hp (600 kW) for two-pole (3000 or 3600 RPM) motors of totally-enclosed construction,
- are rated less than 1250 hp (930 kW) for two-pole motors of WP-II type enclosures,
- drive centrifugal loads,
- drive loads having inertia values within those listed in NEMA MG 1 Part 20),
- are not induction generators. Pages: 62

2nd Edition | May 2017 | Effective Date: November 1, 2017
Reaffirmed: October 2022 | Product Number: C54702 | Price: $147.00

HEAT TRANSFER EQUIPMENT STANDARDS FOR REFINERY SERVICE

Std 530
Calculation of Heater-Tube Thickness in Petroleum Refineries (includes Addendum 1 dated July 2019 and Addendum 2 dated December 2021)

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: $360.00

Std 534 ■
Heat Recovery Steam Generators for Combustion Turbine Exhaust Applications

Specifies minimum requirements and provides guidance for the design, materials, fabrication, inspection, testing, preparation for shipment, and erection of heat recovery steam generators (HRSGs) downstream of combustion turbines in oil and gas application. The scope of this standard covers water tube drum type HRSG with typical operating conditions up to 14000 kPa(g) (2030 psig) and 565 °C (1050 °F) and using a natural circulation evaporator system. Pages: 166

3rd Edition | May 2024 | Product Number: C53402 | Price: $121.00

Std 535 ■
Burners for Fired Heaters in General Refinery Services

Provides requirements and direction for the selection, specification, materials, and testing of burners for fired heaters in general refinery services designed in accordance with API 560. Details of fired heater and related equipment designs are considered only where they interact with the burner selection. Pages: 70

4th Edition | July 2024 | Product Number: C53504 | Price: $220.00

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

Std 536
Post-Combustion NOx Control for Equipment in General Refinery and Petrochemical Services

Specifies requirements and provides guidance for the selection, design specification, mechanical description, operation, maintenance, and test procedures for post-combustion NOx control equipment and related mechanical systems and components used for fired equipment in petrochemical and general refinery service.

This document covers the following methods of post combustion NOx reduction for both new and retrofit applications:

- Selective Non-catalytic Reduction (SNCR), and
- Selective Catalytic Reduction (SCR).

This standard is primarily intended for direct application to fired process heaters, reformers, industrial, and power boilers in petrochemical and general refinery services. The same fundamental NOx control technologies and systems may also be applied to Fluid Catalytic Cracking Units (FCCUs), incinerators, gas turbine exhaust, and other exhaust gas process systems however SCRs may require additional considerations beyond the scope of this standard to address unique aspects, such as high particulate content and corrosive chemicals, in the flue gas stream.

This document does not cover:

- Reduced NOx formation through combustion controls and design techniques such as low NOx burners, flue gas recirculation (FGR), and staged combustion; and
- Non-selective Catalytic Reduction (NSCR) for the control of NOx and other pollutant emissions. Pages: 117

3rd Edition | September 2017 | Reaffirmed: October 2022
Product Number: C53603 | Price: $208.00

Std 537 ■
Flare Details for Petroleum, Petrochemical, and Natural Gas Industries

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 petroleum, petrochemical, and natural gas industries. Although this standard is primarily intended for onshore facilities, guidance related to offshore applications is included. Pages: 242

4th Edition | November 2024 | Product Number: C53704 | Price: $305.00

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 | Reaffirmed: April 2021
Product Number: C53801 | Price: $378.00

Std 560
Fired Heaters for General Refinery Service
(includes Addendum 1 dated May 2021 and Addendum 2 dated December 2023)

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: $416.00

Std 565
Thermal Reactors for Sulfur Recovery Units in General Refinery Services

Provides recognized industry requirements and guidance for the design, specification, fundamental operation, instrumentation, control, safeguarding, and maintenance of sulfur recovery unit (SRU) thermal reactors used in general refinery services. The scope of this standard includes application in both air-only and oxygen-enriched modified-Claus process operations. Pages: 160

1st Edition | June 2022 | Product Number: C56501 | Price: $207.00

RP 573 ◆
Inspection of Fired Boilers and Heaters

Covers 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: 129

4th Edition | January 2021 | Product Number: C57304 | Price: $195.00

Std 660
Shell-and-Tube Heat Exchangers
(includes Addendum 1 dated August 2020)

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: $230.00

Std 660 *
Shell-and-Tube Heat Exchangers—Russian
(includes Addendum 1 dated August 2020)

Russian translation of Std 660.

9th Edition | March 2015 | Product Number: C66009R | Price: $230.00

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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 | Reaffirmed: July 2024
Product Number: C66107 | Price: $311.00

Std 661 *
Petroleum, Petrochemical, and Natural Gas Industries—Air-Cooled Heat Exchangers for General Refinery Service—Russian
(ANSI/API Std 661)

Russian translation of Std 661.

7th Edition | July 2013 | Reaffirmed: July 2024
Product Number: C66107R | Price: $311.00

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 heat exchangers. Pages: 67

2nd Edition | August 2022 | Product Number: C66302 | Price: $239.00

Std 664
Spiral Plate Heat Exchangers
(includes Errata 1 dated February 2021)

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 | Reaffirmed: July 2024
Product Number: C66401 | Price: $217.00

Std 667
Plate-and-Frame Heat Exchangers
(formerly Std 662, Part 1)

Gives requirements and recommendations for the mechanical design, materials selection, fabrication, inspection, testing, and preparation for shipment of plate-and-frame heat exchangers for use in petroleum, petrochemical, and natural gas industries. Pages: 55

1st Edition | March 2022 | Product Number: C66701 | Price: $115.00

Std 668
Brazed Aluminum Plate-Fin Heat Exchangers

Gives requirements and recommendations for the mechanical design, materials selection, fabrication, inspection, testing, and preparation for shipment of brazed aluminum plate-fin heat exchangers for use in the petroleum, petrochemical, and natural gas industries. This edition is a revision of the First Edition of Std 662, Part 2. Pages: 49

1st Edition | November 2018 | Product Number: C66801 | Price: $175.00

Std 669
Heat Recovery Systems

Provides guidelines for heat transfer equipment used in waste heat recovery systems in the petroleum, petrochemical, and natural gas industries. Details of related equipment designs are included only where these are necessary to ensure proper design and operation and safe interaction with the heat recovery system. It indicates areas that need attention and offers information and descriptions of various types of heat transfer equipment available to aid in the selection of the appropriate heat recovery system. Pages: 84

1st Edition | June 2022 | Product Number: C66901 | Price: $157.00

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 | Reaffirmed: April 2024
Product Number: C55102 | Price: $196.00

RP 551 *
Process Measurement Instrumentation—Russian

Russian translation of RP 551.

2nd Edition | February 2016 | Reaffirmed: April 2024
Product Number: C55102R | Price: $196.00

RP 552
Transmission Systems

Reviews the recommended practices for the installation of electronic and pneumatic measurement and control-signal transmission systems. It does not discuss leased wire, radio, and telemetering transmission. Pages: 39

1st Edition | October 1994 | Reaffirmed: November 2022
2-Year Extension: November 2012
Product Number: C55201 | Price: $203.00

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: $180.00

RP 553 *
Refinery Valves and Accessories for Control and Safety Instrumented Systems—Russian

Russian translation of RP 553.

2nd Edition | October 2012 | Product Number: C55302R | Price: $180.00

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

RP 554, Part 1
Process Control Systems, Part 1—Process Control Systems Functions and Functional Specification Development

Addresses the processes required to successfully implement process control systems (PCSs) for oil and gas production, refinery, and petrochemical services. The major topics addressed in Part 1 are 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: 53

3rd Edition | April 2021 | Product Number: C55403 | Price: $174.00

RP 554, Part 2
Process Control Systems, Part 2—Process Control System Design

addresses the processes required to successfully implement process control systems (PCSs) for oil and gas production, refinery, and petrochemical services. The major topics addressed are: Part 1: The basic functions that a PCS may need to perform, and recommended methodologies for determining the functional and integration requirements for a particular application; Part 2: Practices to select and design the installation for hardware and software required to meet the functional and integration requirements; and Part 3: Project organization, skills, and management required to execute a process control project and then to own and operate a PCS. The general scope of the material covers general industrial process control topics that are applicable to oil and gas production, refineries, and petrochemical facilities. Pages: 78

2nd Edition | August 2023 | Product Number: C554202 | Price: $174.00

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 oil and gas production, refinery, and petrochemical services. The major topic addressed is he project organization, skills, and management required to first execute a process control project and then to own and operate a PCS. Pages: 48

2nd Edition | January 2021 | Product Number: C554302 | Price: $132.00

API 555
Process Analyzers

Addresses the considerations in the application of analyzers and associated systems, installation, and maintenance. Process monitors that measure and transmit information about chemical composition, physical properties, or chemical properties are known as process analyzer systems. Process analyzers are now used widely in the refining industry for

- monitoring and controlling product quality,
- implementing advanced control strategies in improving process operations,
- enhancing area safety, and
- continuous emission monitoring and environmental measurement of air and water quality. Pages: 314

3rd Edition | June 2013 | Reaffirmed: June 2020
Product Number: C55503 | Price: $236.00

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 | Reaffirmed: April 2024
Product Number: C55602 | Price: $190.00

RP 556 *
Instrumentation, Control, and Protective Systems for Gas Fired Heaters—Russian

Russian translation of RP 556.

2nd Edition | April 2011 | Reaffirmed: April 2024
Product Number: C55602R | Price: $190.00

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 | Reaffirmed: April 2024
Product Number: C55702 | Price: $137.00

TECHNICAL DATA BOOK PETROLEUM REFINING

Electronic Version of the API Technical Data Book

Improve the overall design and operations in today's highly complex petroleum refinery process systems with the API Technical Database. Version 1.0 of the API Technical Database replaces the printed format of the popular API Tech Data Books with a modern Windows interface that is so unique it is patented. This single screen approach provides access to the latest API physical property estimation methods and the software is critically reviewed and approved by the API Technical Data Committee. Included is a database of property data for nearly 900 components, characterization of petroleum fractions, and petroleum fraction distillation interconversions. Users can quickly determine petroleum fraction physical property data such as critical properties, vapor pressure, density, liquid enthalpy, gas enthalpy, heat of vaporization, liquid heat capacity, gas heat capacity, surface tension, liquid viscosity, gas viscosity, liquid thermal conductivity, gas thermal conductivity, and heat of combustion. Temperature-dependent properties can be tabulated and graphed over any range, and distillation interconversions are displayed graphically. This data can then be exported for use in simulation and engineering software programs.

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TECHNICAL DATA BOOK PETROLEUM REFINING: RELATED ITEMS

Reports Issued by Research Project 49
1951

API Research Project 49, Reference Clay Minerals, issued a series of eight reports, as follows:

No. 1, Glossary of Mineral Names

No. 2, Reference Clay Localities-United States

No. 3, Differential Thermal Analysis of Reference Clay Mineral Specimens

No. 4, Reference Clay-Europe

No. 5, Occurrence and Microscopic Examination of Reference Clay Mineral Specimens

No. 6, Electron Micrographs of Reference Clay Minerals

No. 7, Analytical Data on Reference Clay Minerals

No. 8, Infrared Spectra of Clay Minerals

TR 997
Comprehensive Report of API Crude Oil Characterization Measurements

A consortium of API member companies has sponsored a research program consisting of a series of projects on the characterization of crude oils. The goal of this program was to obtain complete sets of assay and thermophysical property data on a few widely varying crude oil refining and refining facilities. This report provides descriptions of the test procedures, discussions of their accuracy, and comprehensive compilation of the data for the crude oils measured under this program. Pages: 129

1st Edition | August 2000 | Product Number: C99701 | Price: $228.00

CHARACTERIZATION AND THERMODYNAMICS

API Monograph Series

Each publication discusses the properties of solid, liquid, and gaseous phases of one or a few closely related, industrially important compounds in a compact, convenient, and systematic form. In addition to the basic physical properties, each publication covers density, molar volume, vapor pressure, enthalpy of vaporization, surface tension, thermodynamic properties, viscosity, thermal conductivity, references to properties of mixtures, and spectrographic data.

Publ 705, Tetralin, 1978

Publ 706, cis- and trans-Decalin, 1978

Publ 707, Naphthalene, 1978

Publ 708, Anthacene and Phenanthrene 9, 1979

Publ 709, Four-Ring Condensed Aromatic Compounds, 1979

Publ 710, Pyridine and Phenylpyridines, 1979

Publ 711, Quinoline, 1979

Publ 712, Isoquinoline, 1979

Publ 713, Indanols, 1980

Publ 714, Indan and Indene, 1980

Publ 715, Acenaphthylene, Acenaphthene, Fluorene, and Fluoranthene, 1981

Publ 716, Carbazole, 9-Methylcarbazole, and Acridine, 1981

Publ 717, Thiphene, 2,3- and 2,5-Dihydrothiophene, and Tetrahydrothiophene, 1981

Publ 718, Aniline, 1982

Publ 719, Indole, 1982

Publ 720, 2-, 3-, and 4-Methylaniline, 1983

Publ 721, Benzofuran, Dibenzofuran, and Benzonaphthofurans, 1983

Publ 722, Isopropylbenzene, and 1-Methyl-2-, -3-, and -4-Isopropylbenzene, 1984

Publ 723, tert-Butyl methyl ether, 1984

Publ 724, 1- and 2-Methylnaphthalene and Dibenzanthracenes, 1985

Thermodynamic Properties and Characterization of Petroleum Fractions

February 1988

MATERIALS ENGINEERING PUBLICATIONS

API Coke Drum Survey 1996
Final Report

In 1996 a survey was sent by the API Subcommittee on Inspection, Coke Drum Task Group, to companies operating coke drums in the United States and abroad. This was the third survey of similar nature conducted by API. Fifty-four surveys were returned representing 17 operating companies and a total of 145 drums. The purpose of the survey was to collect data covering a broad range of issues including: 1. General Information; 2. Design; 3. Operating Information; 4. Inspection Practices; 5. Deterioration Experience; and 6. Repair Procedures.

Three of the six areas, Operation Information, Inspection Practices and Deterioration Experience, were not covered in previous industry surveys. Additionally, this survey requested more detailed information than previous surveys. Pages: 61

October 2003 | Product Number: C096C1 | Price: $134.00

Impact of Gasoline Blended with Ethanol on the Long-Term Structural Integrity of Liquid Petroleum Storage Systems and Components

Summarizes the results of a literature review conducted for the American Petroleum Institute on the impact of gasoline blended with ethanol on the long-term structural integrity of liquid petroleum storage systems and components. It is anticipated that the use of ethanol in motor fuels will continue to increase. This has generated interest about the potential long-term structural effects of ethanol on liquid petroleum storage systems, including underground storage tanks (USTs), underground piping, and associated components. The objective of the literature review is to determine the state of industry knowledge and research on the effects of ethanol/gasoline blends on the long-term structural integrity of UST systems and components. This review is intended to assist decision-makers on further research requirements and needed changes or supplements to existing standards for underground storage system components used for storing and dispensing gasoline blended with ethanol. Appendix A may be purchased separately as an electronic database file. The database synopsis' and bibliographic information for all articles reviewed for the project. The report is organized by article index number. Reference numbers cited in this report refer to the article index number.

January 2003 | Executive Summary | Price: $71.00
Appendix A—Literature Review | Price: $138.00

RP 571 ◆
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry

Provides background information on damage that can occur to equipment in the refining process. It is intended to supplement Risk-Based Inspection (RP 580 and Publ 581) and Fitness-for-Service (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: 376

3rd Edition | March 2020 | Product Number: C57103 | Price: $450.00

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RP 571 *■
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Chinese

Chinese translation of RP 571.

3rd Edition | March 2020 | Product Number: C57103C | Price: $450.00

RP 571 *■
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Japanese

Japanese translation of RP 571.

3rd Edition | March 2020 | Product Number: C57103J | Price: $450.00

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-retaining equipment; tanks and attachment welds; nonremovable internals for process equipment; structural items attached and related to process equipment; and other equipment or component items when referenced by an applicable purchase document. Pages: 78

4th Edition | May 2023 | Product Number: C58204 | Price: $166.00

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: C932A0 | Price: $164.00

RP 932-B
Design, Materials, Fabrication, Operation, and Inspection Guidelines for Corrosion Control in Hydroprocessing Reactor Effluent Air Cooler (REAC) Systems

Provides guidance to engineering and plant personnel on equipment and piping design, material selection, fabrication, operation, and inspection practices to manage corrosion and fouling in the wet sections of hydroprocessing reactor effluent systems. The reactor effluent system includes the equipment and piping subject to ammonium salting, NH4HS corrosion, and associated fouling. This system usually begins at the last feed/effluent exchanger or first water injection point and continues through the cold high-pressure separator (1, 2, and 3 separator designs) or cold high- and low-pressure separators (4 and 5 separator designs). The reactor effluent system specifically excludes the stripper, fractionator, and final separation sections. However, guidance in this document may be applicable to ammonium salt corrosion mitigation in those areas, as well. The majority of these systems have an air cooler; however, some systems utilize only shell and tube heat exchangers. Reactor effluent systems are prone to fouling and corrosion by ammonium bisulfide (NH_4HS) and ammonium chloride (NH_4Cl) salts.

This recommended practice is applicable to process streams in which NH_4Cl and NH_4HS salts can form and deposit in equipment and piping or dissolve in water to form aqueous solutions of these salts. Included in this practice are: details of deterioration mechanisms; methods to assess and monitor the corrosivity of systems; details on materials selection, design, and fabrication of equipment for new and revamped processes; considerations in equipment repairs; and details of an inspection plan. Pages: 70

3rd Edition | June 2019 | Product Number: C932B03 | Price: $335.00

TR 932-C
Use of Duplex Stainless Steels in Hydroprocessing Reactor Effluent Air Coolers (REACs)

Covers results of a survey of the petroleum refining industry concerning the use of duplex stainless steel (DSS) in hydroprocessing reactor effluent air cooler (REAC) systems. The API Committee on Refining Equipment Subcommittee on Corrosion and Materials (SCCM) commissioned this survey after several industry reports of weldment cracking failures with DSS REAC system components, including REAC header boxes, tube-to-tubesheet welds, and associated piping. REAC component weldment cracking has been addressed in SCCM documents, including TR 932-B and TR 938-C, in published conference papers, and in a report issued by the Materials Technology Institute (MTI). Pages: 48

1st Edition | August 2022 | Product Number: C932C01 | Price: $125.00

RP 934-A
Materials and Fabrication of 2 $^1/_4$Cr-1Mo, 2 $^1/_4$Cr-1Mo-$^1/_4$V, 3Cr-1Mo, and 3Cr-1Mo-$^1/_4$V Steel Heavy Wall Pressure Vessels for High-Temperature, High-Pressure Hydrogen Service
(includes Errata 1 dated September 2021)

Covers materials and fabrication requirements for new 2¼Cr and 3Cr steel heavy wall pressure vessels for high-temperature, high-pressure hydrogen service. For this recommended practice (RP), "heavy wall" is defined as a shell thickness of 4 in. (100 mm) or greater, and high-temperature is considered to be operating temperatures of 650 °F (345 °C) and above. This RP applies to vessels that are designed, fabricated, certified, and documented in accordance with ASME Section VIII, Division 2, including Paragraph 3.4, Supplemental Requirements for Cr-Mo Steels, and ASME Code Case 2151, as applicable.

Materials covered by this RP are conventional steels including standard 2¼Cr-1Mo and 3Cr-1Mo steels, and advanced steels which include 2¼Cr-1Mo-¼V, 3Cr-1Mo-¼V-Ti-B, and 3Cr-1Mo-¼V-Nb-Ca steels. This document may be used as a reference document for the fabrication of vessels made of enhanced steels (steels with mechanical properties increased by special heat treatments such as ASME SA-542, Grade B, Class 4) at the purchaser's discretion. However, no attempt has been made to cover specific requirements for the enhanced steels and they may be different than the requirements for vanadium grade. Pages: 57

3rd Edition | January 2019 | Product Number: C934A03 | Price: $198.00

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 steels intended for service in petroleum refining, petrochemical, or chemical facilities. These materials are primarily used in high-temperature, high-pressure services that contain hydrogen. The document provides typical practices to be followed during fabrication, based upon experience and the knowledge gained from actual problems that have occurred during the fabrication of vanadium-modified Cr-Mo steels. Pages: 44

2nd Edition | January 2022 | Product Number: C934B02 | Price: $183.00

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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 (440 °C)

Covers materials and fabrication requirements for new 1¼Cr-Mo 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 Section VIII, Division 1 or Division 2. This document may also be used as a resource for equipment fabricated of 1Cr-½Mo Steel. This document may also be used as a resource 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, "heavy wall" is defined as a shell thickness 2 in. (50 mm) or greater, but less than or equal to 4 in. (100 mm) at the time of mill heat treatment.

Although outside of its scope, this document can be used as a resource for vessels down to 1 in. (25 mm) or lower in shell thickness, with changes defined by the purchaser. Pages: 25

2nd Edition | February 2019 | Reaffirmed: July 2024
Product Number: C934C02 | Price: $143.00

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 petroleum industry and 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 service conditions (e.g., high temperature and/or high pressure hydrogen), which require heavy walls and cause in service deterioration. As such, the steels are subject to special requirements, such as notch toughness, elevated temperature tensile properties, hardness, fabrication heat treatments, etc., which may limit the maximum thickness to be able to meet the desired properties. Corrosion protection by stainless steel weld overlay or cladding may also be required.

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 1/4/1Cr-1/2Mo steels. Whereas RP 934-A continues to provide materials and fabrication requirements for new 2 1/4/3Cr-1Mo and 2 1/4/3Cr-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 1/4/1Cr-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 1/4/1Cr-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 1/4/1Cr-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: $146.00

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)

Includes materials and fabrication requirements for new 1¼Cr-½Mo and 1Cr-½Mo steel pressure vessels, including heat exchanger shells and channels for elevated temperature service. It applies to vessels that are designed, fabricated, and documented in accordance with ASME Code Section VIII, Division 1, or Division 2 (hereafter referred to as "Code"). This document may also be used as a resource when planning to modify existing pressure vessels. The interior surfaces of these pressure vessels and heat exchangers (i.e. the surfaces exposed to the process) may or may not have an austenitic stainless steel (SS), ferritic SS, or nickel alloy weld overlay or cladding to provide additional corrosion resistance.

This RP is primarily intended for wall thicknesses less than 4 in. (100 mm), and a preferred option for thicker components is to use 2¼Cr-1Mo alloys. This RP is applicable to shell thicknesses greater than 1 in. (25 mm). Although outside of the scope, this document can be used as a resource for vessels down to lower shell thicknesses with changes defined by the purchaser. Pages: 27

2nd Edition | January 2018 | | Reaffirmed: July 2024
Product Number: C934E02 | Price: $175.00

TR 934-F, Part 1

Impact of Hydrogen Embrittlement on Minimum Pressurization Temperature for Thick-Wall Cr-Mo Steel Reactors in High-Pressure H_2 Service—Initial Technical Basis for RP 934-F

In support of API Recommended Practice 934-F [*Guidance for Establishing a Minimum Pressurization Temperature (MPT) for Heavy Wall Reactors in High Temperature Hydrogen Service During Startups and Shutdowns*, not yet published], the objective of this study is to establish the technical basis for determining a minimum pressurization temperature necessary to avoid Internal Hydrogen Assisted Cracking (IHAC) of weld metal and base plate of temper embrittled 2¼Cr-1Mo steel in high pressure H_2 service. The threshold condition for the onset of subcritical crack propagation—and its dependencies on dissolved hydrogen concentration, temperature, and steel purity/temper embrittlement—are targeted as particularly important to pressure vessel safe operations. A second objective is to improve the underlying database for fracture mechanics fitness-for-service (FFS) modeling of IHAC. Both analyses are built on the conservative rising-displacement threshold stress intensity factor for IHAC (KIH).

This investigation has accomplished 5 tasks, leading to conclusions that are sufficient to establish RP 934-F on MPT to conservatively avoid IHAC in 2¼Cr-1Mo steel.

Task 1—Summarize and clarify the technical approach, assumptions, data, and modeling results used in Phase II JIP research to quantitatively establish the H concentration and temperature dependencies of the threshold stress intensity, KIH, for IHAC and the concentration dependence of MPT for moderate-impurity 2¼Cr-1Mo steel.

Task 2—Validate the Phase II correlation of KIH and critical temperature vs H concentration, based on new analyses of post-Phase-II IHAC data.

Task 3.0—Enhance the Phase II analysis of KIH vs crack tip H concentration, and thus MPT, by describing the interaction between temper embrittlement and IHAC using JIP Phase I data so as to predict the influence of modern steel purity.

Task 4.0—Build on the hydrogen-damage-mechanism-based master correlation between KIH and crack tip stress field/microstructure-trapped H to develop a H concentration similitude parameter that is useful in engineering analysis of thick-wall reactor FFS and MPT.

Task 5.0—Validate the empirically based trends and predictions of the effects of temperature and steel purity on the threshold stress intensity through consideration of state-of-the art theory and micromechanical modeling of IHAC. Pages: 118

1st Edition | September 2017
Product Number: C934F101 | Price: $231.00

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TR 934-F, Part 2
Literature Review of Fracture Mechanics-Based Experimental Data for Internal Hydrogen-Assisted Cracking of Vanadium-Modified 2-¼Cr-1Mo Steel

Documents a critical assessment of the existing literature on IHAC of V-modified Cr-Mo steels for use in interpreting the results of the present laboratory work and so as to establish a definitive characterization of the H cracking resistance of this steel class. Since these modern Cr-Mo-V steels are of relatively high purity, and thus retain a low FATT after laboratory simulation of in-service temper embrittlement, the database for 2¼Cr-1Mo provides a context for assessment of the IHAC performance of V-modified grades. Hydrogen cracking of less pure V-modified Cr-Mo steels was not considered in this review. The content that follows is chronologically organized into initial and more modern works, as justified by improvement in test execution, data analysis, and reporting, as well as the evolution from laboratory to commercial scale heats of Cr-Mo-V. Pages: 46

1st Edition | August 2017 | Product Number: C934F201 | Price: $154.00

TR 934-F, Part 3
Subcritical Cracking of Modern 2¼Cr-1Mo-¼V Steel Due to Dissolved Internal Hydrogen and H_2 Environment, Research Report

Conveys the results of API-sponsored research to: (a) quantitatively characterize the internal hydrogen assisted cracking (IHAC) resistance of modern 2¼Cr-1Mo-¼V steel, in both base metal and weld metal product forms and including the effect of stressing temperature, (b) scope the hydrogen environment assisted cracking (HEAC) resistance of 2¼Cr-1Mo-¼V base metal, (c) understand the mechanism(s) for the IHAC and HEAC behaviors of Cr-Mo and Cr-Mo-V steels, centered on H interactions with microstructure-scale trap sites, and (d) assess application of data and understanding of IHAC and HEAC to determine the role of subcritical H-assisted cracking on a minimum pressurization temperature estimate relevant to thick-wall hydro-treating reactor vessels. Pages: 170

1st Edition | December 2017 | Product Number: C934F01 | Price: $217.00

TR 934-F, Part 4
The Effects of Hydrogen for Establishing a Minimum Pressurization Temperature (MPT) for Heavy Wall Steel Reactor Vessels

Hydrogen, dissolved in the thick wall of a steel pressure vessel during steady-state operation in elevated temperature, high-pressure H2, can cause both slow-subcritical crack advance as well as unstable-catastrophic fracture during shutdown and startup. This behavior is defined in Section 2. It follows that modern fracture-mechanics assessments of the minimum pressurization temperature (MPT) and fitness for service (FFS) must include the deleterious effect of H on both subcritical and unstable internal hydrogen assisted cracking (IHAC). Two approaches are in draft stage to develop standard procedures that address this need; an API 934-F recommended practice and a WRC Bulletin 562 basis for ASME/API 579. The objective of this technical report is to establish the technical basis necessary to enable and validate these best practices for quantifying the effects of hydrogen on (a) the MPT and (b) FFS of a thick wall hydroprocessing reactor. Pages: 112

1st Edition | November 2018
Product Number: C934F401 | Price: $224.00

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: $187.00

TR 934-H
Inspection, Assessment, and Repair of Heavy Wall Reactor Vessels in High-Temperature High-Pressure Hydrogen Service

Documents guidance for the inspection, assessment, and repair of heavy wall reactor vessels [nominally considered a wall thickness of 50 mm (2 in.) and greater] in high-pressure hydrogen service operating at temperatures below 455 °C (850 °F). It provides industry practices dealing with reactor vessels after construction and exposure to operating conditions. It focuses on reactor vessels fabricated from 2¼Cr-1Mo, 3Cr-1Mo, 2¼Cr-1Mo-¼V, and 3Cr-1Mo-¼V steels. It also offers some guidance for heavy wall reactor vessels fabricated from 1Cr-½Mo and 1¼Cr-½Mo steels, but specifically does not pertain to C-½Mo steel vessels. However, guidance included in this document can be used for C-½Mo steel reactor vessels at the owner's discretion and with modifications as appropriate. Since this is a technical report, it does not provide recommendations, but instead presents industry experience with case histories of repairs and recognized practices, much of which was documented as part of a Joint Industry Program (JIP) on Aging Reactor Vessels, conducted in two phases between 1995 and 2004. Pages: 77

1st Edition | May 2022 | Product Number: C934H01 | Price: $131.00

TR 934-J
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 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, repair techniques, and/or engineering assessments offered by contractors. Pages: 94

1st Edition | September 2021 | Product Number: C934J01 | Price: $132.00

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: $76.00

Std 936 ◆■
Refractory Installation Quality Control—Inspection and Testing Monolithic Refractory Linings and Materials

Provides installation quality control procedures for monolithic refractory linings and may be used to supplement owner specifications. Materials, equipment, and personnel are qualified by the methods described, and applied refractory quality is closely monitored, based on defined procedures and acceptance criteria. The responsibilities of inspection personnel who monitor and direct the quality control process are also defined. In addition, this standard provides guidance for the establishment of quality control elements necessary to achieve the defined requirements in a monolithic installation. Pages: 78

5th Edition | March 2024 | Product Number: C93605 | Price: $160.00

To purchase individual API standards, visit apiwebstore.org

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: $133.00

Publ 938-A
An Experimental Study of Causes and Repair of Cracking of 1¼Cr-$^{1}/_{2}$Mo Steel Equipment

Gives the results of an experimental study conducted to provide the petroleum industry with solutions to recurring incidents of cracking in the application of welded $1^{1}/_{4}$Cr-$^{1}/_{2}$Mo steel for hydrogen processing equipment. Pages: 220

1st Edition | May 1996 | Product Number: C93801 | Price: $178.00

Publ 938-B
Use of 9Cr-1Mo-V (Grade 91) Steel in the Oil Refining Industry

Provides guidelines on the proper specifications for base metal and welding consumables and successful fabrication, including welding and heat treatment requirements, for use of 9Cr-1Mo-V alloy steel in oil refinery services. This includes guidelines for preheat, postweld heat treatment, procedure qualification, and mechanical and nondestructive testing. It covers the basic material and metallurgical properties of 9Cr-1Mo-V steel, including a summary of the physical and mechanical properties, corrosion and oxidation resistance, indicating possible corrosion and/or mechanical failure mechanisms and how to avoid them. The appropriate base metal heat treatment is also given. This document also defines hardness limits for the base material and welds in order to avoid cracking failures due to wet sulfide stress corrosion cracking or due to other possible failure mechanisms. A discussion of both proper and improper refinery service applications for these steels is also provided. Pages: 40

1st Edition | June 2008 | Product Number: C938B01 | Price: $118.00

TR 938-C ■
Use of Duplex Stainless Steels in the Oil Refining Industry

Covers many of the "lean," "standard," "super," and "hyper" grades of duplex stainless steels (DSSs) most commonly used within refineries. These terms have not been firmly established by the industry, and their use may vary between literature references and suppliers. ISO 17781, *Petroleum, petrochemical and natural gas industries—Test methods for quality control of microstructure of ferritic/austenitic (duplex) stainless steels,* provides a fairly consistent and inclusive classification of these materials based on their chemical composition and corrosion resistance. Pages: 82

4th Edition | May 2024 | Product Number: C938C04 | Price: $224.00

Publ 939-A
Research Report on Characterization and Monitoring of Cracking in Wet H_2S Service

Demonstrates the ability to characterize and monitor various aspects of crack propagation in pressurized process equipment exposed to wet hydrogen sulfide environments. It represents one of several significant industry-wide efforts to study and to better understand this phenomenon. Pages: 136

1st Edition | October 1994 | Product Number: C93901 | Price: $170.00

Publ 939-B
Repair and Remediation Strategies for Equipment Operating in Wet H_2S Service

Presents data relative to the fabrication requirements for $2^{1}/_{4}$ 3Cr alloy steel heavy wall pressure vessels for high temperature, high pressure hydrogen services. It summarizes the results of industry experience, experimentation, and testing conducted by independent manufacturers, fabricators, and users of heavy wall pressure vessels. This recommended practice applies to equipment in refineries, petrochemical, and chemical facilities in which hydrogen or hydrogen-containing fluids are processed at elevated temperature and pressure. Pages: 236

1st Edition | June 2002 | Product Number: C939B0 | Price: $185.00

RP 939-C
Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries

Applies to hydrocarbon process streams with sulfur-containing compounds, without the presence of hydrogen, that operate at temperatures above approximately 500 °F (260 °C) up to about 1000 °F (540 °C). There is considerable debate in the industry as to the correct threshold temperature for hydrogen-free sulfidation and, in a change in this edition, the API 571 threshold of 500 °F (260 °C) is adopted herein. Experience has shown that little significant corrosion will occur at operating temperatures below 500 °F (260 °C) for hydrogen free sulfidation services without the influence of naphthenic acid corrosion. Mercaptan corrosion, particularly in condensate service, has been reported below this temperature, but is not explicitly covered in the 2nd Edition of RP 939-C. For hydrogen-containing services, the threshold temperature is set at 450 °F (230 °C).

A lower threshold limit for sulfur content is not provided because significant corrosion has occurred in the reboiler/fractionator sections of some hydroprocessing units (which do not contain hydrogen) at measured sulfur or H_2S levels as low as 1 ppm. Pages: 59

2nd Edition | January 2019 | | Reaffirmed: January 2024
Product Number: C939C02 | Price: $181.00

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: $199.00

Bull 939-E
Identification, Repair, and Mitigation of Cracking of Steel Equipment in Fuel Ethanol Service

Usage of fuel ethanol as an oxygenate additive in gasoline blends is increasing, both in the United States and internationally. This document discusses stress corrosion cracking (SCC) of carbon steel tanks, piping and equipment exposed to fuel ethanol as a consequence of being in the distribution system, at ethanol distribution facilities, or end user facilities where the fuel ethanol is eventually added to gasoline. Such equipment includes but is not limited to:

- storage tanks,
- piping and related handling equipment, and
- pipelines that are used in distribution, handling, storage, and blending of fuel ethanol.

However, data for pipelines in ethanol service is limited and caution should be used when applying guidelines from this document, which have been derived mainly from applications involving piping and tanks in ethanol storage and blending facilities. SCC of other metals and alloys is beyond the scope of this document, as is the corrosion of steel in this service. Pages: 42

2nd Edition | August 2013 | Product Number: C939E02 | Price: $174.00

■ 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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RP 941

Steels for Hydrogen Service at Elevated Temperatures and Pressures in Petroleum Refineries and Petrochemical Plants

(includes Errata 1 dated June 2016, Errata 2 dated December 2017, and Addendum 1 dated August 2020)

Summarizes the results of experimental tests and actual data acquired from operating plants to establish practical operating limits for carbon and low alloy steels in hydrogen service at elevated temperatures and pressures. The effects on the resistance of steels to hydrogen at elevated temperature and pressure that result from high stress, heat treating, chemical composition, and cladding are discussed. This recommended practice (RP) does not address the resistance of steels to hydrogen at lower temperatures [below about 400 °F (204 °C)], where atomic hydrogen enters the steel as a result of an electrochemical mechanism.

This RP applies to equipment in refineries, petrochemical facilities, and chemical facilities in which hydrogen or hydrogen-containing fluids are processed at elevated temperature and pressure. The guidelines in this RP can also be applied to hydrogenation plants such as those that manufacture ammonia, methanol, edible oils, and higher alcohols.

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

8th Edition | February 2016 | Product Number: C94108 | Price: $175.00

TR 941-A

The Technical Basis Document for API RP 941

(includes Addendum 1 dated June 2019)

Even before the first edition of API Publ 941, *Steels for Hydrogen Service at Elevated Temperatures and Pressures in Petroleum Refineries and Petrochemical Plants* appeared in 1970, there had been fundamental questions regarding the technical basis for the material performance curves contained in the document (1–6). Based upon sparse laboratory data combined with plant experience, with only a few exceptions, the curves have done an exceptionally good job at safely directing the refining industry in selecting materials based upon operating temperature, hydrogen partial pressure, and the metallurgy of the equipment being considered. Pages: 301

1st Edition | September 2008 | Product Number: C09410 | Price: $235.00

TR 942-A

Materials, Fabrication, and Repair Considerations for Hydrogen Reformer Furnace Outlet Pigtails and Manifolds

Addresses materials, fabrication, and repair issues related to hydrogen and syngas reformer furnace outlet pigtails and manifolds. High reliability of outlet pigtails 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 pigtails 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 pigtails and manifold components in service, while others have not had such problems. Pages: 53

1st Edition | June 2014 | Product Number: C942A01 | Price: $175.00

TR 942-B

Material, Fabrication, and Repair Considerations for Austenitic Alloys Subject to Embrittlement and Cracking in High Temperature 565 °C to 760 °C (1050 °F to 1400 °F) Refinery Services

Focuses on the materials, fabrication, and repair of austenitic stainless steels and nickel-iron-chromium alloys in high temperature 565 °C to 760 °C (1050 °F to 1400 °F) refinery services. Many of these alloys are subject to embrittlement and cracking after prolonged exposure to these temperatures. Susceptible equipment in the following processing units are addressed: fluid catalytic cracking units, hydrogen/syngas plants, catalytic reformers, cokers, and hydroprocessing units. This report summarizes industry experience and recommends methods to improve reliability and process safety, and increases industry awareness to high temperature embrittlement issues.

As a basis of this report, technical literature, industry experience, and published case studies were reviewed. The review included materials of construction, damage mechanisms, and component-specific fabrication and repair issues.

The scope of this report includes the following wrought austenitic alloys: Alloys 800, 800H, 800HT, and 300 series austenitic stainless steels, and corresponding welding consumables. Limits in chemical composition, microstructural requirements, and heat treating practices that mitigate susceptibility to embrittlement and cracking are identified. Potentially viable upgrades to commonly used alloys are identified where applicable.

The remainder of this report is organized as follows: Section 3, Process Units, gives a brief process overview followed by an explanation of the various damage mechanisms found in that unit. Component specific considerations and examples of in-service damage are also included. Inspection recommendations and general repair method considerations are also included. Section 4, Damage Mechanisms, contains detailed discussions of high-temperature damage mechanisms, including fundamental details of the solid state reactions, their rate of reaction, and recommended mitigation measures. Section 4 also incorporates fabrication and repair practices that can be used for cracked or embrittled equipment. Pages: 88

1st Edition | May 2017 | Effective Date: November 1, 2017
Product Number: C942B01 | Price: $215.00

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RP 945
Avoiding Environmental Cracking in Amine Units

Discusses environmental cracking problems of carbon steel equipment in amine units. This publication provides guidelines for carbon steel construction materials, including, fabrication, inspection, and repair, to help assure safe and reliable operation. The steels referred to in this document are defined by the ASTM designation system, or equivalent materials contained in other recognized codes or standards. This document is based on current engineering practices and insights from recent industry experience. Pages: 46

4th Edition | September 2022 | Product Number: C94504 | Price: $126.00

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: $196.00

RP 970
Corrosion Control Document Systems

Provides users with the basic elements for developing, implementing, and maintaining a Corrosion Control Document (CCD) for refining and, at the owner's discretion, may be applied at petrochemical and chemical process facilities. A CCD is a document or other repository or system that contains all the necessary information to understand materials damage susceptibility issues in a specific type of operating process unit at a plant site. CCDs are a valuable addition to an effective Mechanical Integrity Program. They help to identify the damage mechanism susceptibilities of pressure containing piping and equipment, factors that influence damage mechanism susceptibilities, and recommended actions to mitigate the risk of loss of containment or unplanned outages. This RP serves as the basis for tracking CCD development, implementation, and maintenance to maintain consistency and to integrate the CCD work process with other plant integrity programs, such as Management of Change (MOC), Process Hazards Analysis (PHA), and Reliability Centered Maintenance (RCM). Pages: 61

2nd Edition | April 2023 | Product Number: C97002 | Price: $225.00

Std 975
Refractory Installation Quality Control—Inspection and Testing of Refractory Brick Systems and Materials

Provides installation quality control (QC) procedures for aluminum silicate dense and insulating fire brick refractory systems and may be used to supplement owner specifications. Materials, equipment, and personnel are qualified by the methods described, and applied refractory quality is closely monitored, based on defined procedures and acceptance criteria. The responsibilities of inspection personnel who monitor and direct the QC process are also defined. Pages: 40

1st Edition | November 2021 | Product Number: C97501 | Price: $108.00

Std 976 ■
Refractory Installation Quality Control—Inspection and Testing of AES/RCF Linings and Materials

Provides installation quality control procedures and lining system design requirements for alkaline earth silicate fiber (AES)/refractory ceramic fiber (RCF) linings and may be used to supplement owner specifications. Materials, equipment, and personnel are qualified by the methods described, and applied refractory quality is closely monitored, based on defined procedures and acceptance criteria. The responsibilities of inspection personnel who monitor and direct the quality control process are also defined. Pages: 33

2nd Edition | October 2024 | Product Number: C97602 | Price: $153.00

TR 977
ASTM C704 Test Variability Reduced to Allow Further Optimization of Erosion-Resistant Refractories for Critical Oil Refining Applications

Documents the results of a joint project conducted by the API CRE Subcommittee on Refractory Materials and the ASTM C08 Committee to improve the reproducibility of the 2015 edition of ASTM C704/C704M, *Standard Test Method for Abrasion Resistance of Refractory Materials at Room Temperature*. Erosion-resistant refractories are used in many oil refining applications, such as Fluid Catalytic Cracking Units (FCCUs), to resist the wearing effects of solids particles circulating at elevated velocities in a high-temperature process environment. This technical report also reviews the drivers for continuing improvement in erosion-resistant refractories and the role of ASTM C704/C704M for the selection and installation quality control of refractories used in these installations. This report documents changes made to the setup and procedures to improve the reproducibility of the test. These changes are designed to achieve this end, while providing a rough equivalency consistent with historical data before the changes were made. These results are validated by the results of extensive international round-robin and ruggedness testing, and are reported herein. Pages: 27

1st Edition | February 2018 | Product Number: C97701 | Price: $142.00

TR 978
Monolithic Refractories: Manufacture, Properties, and Selection

Covers the installation and dryout of monolithic refractory lining materials for Hydrocarbon Processing Industry (HPI) applications. It discusses the best practice procedures and techniques used in the installation of refractory concrete, as well as those for air and heat setting plastics and ramming mixes. In addition, it addresses the need for curing and dryout procedures to achieve successful results. This instruction is consistent with API 936, which is the HPI industry standard for the installation quality control of monolithic refractories. Pages: 82

1st Edition | March 2019 | Product Number: C97801 | Price: $140.00

■ This publication is a new entry in this catalog.

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

TR 979
Applications of Refractory Lining Materials

Covers the use of refractory concrete (castables), plastics, and ramming mixes for applications for the hydrocarbon processing industry (HPI). Its content is complemented by the two other reports in this series:

- API TR 978, *Monolithic Refractories: Manufacture, Properties and Selection*;
- API TR 980, *Monolithic Refractories: Installation and Dryout*.

These technical reports update and add to the original reports written by Committee 547 of the American Concrete Institute (ACI) in 1979 and 1989. These are ACI 547.R-79, *State-of-the Art Report: Refractory Concrete*, and ACI 547.1R-89, *State-of-the Art Report: Refractory Plastics and Ramming Mixes*. TR 979 focuses specifically on the information on the applications of refractories contained in ACI 547.R-79 and ACI 547.1R-89.

The original content of these reports was focused primarily on steel- and glass-making applications, which represent the largest refractory markets. API, in tailoring the revision of this content to the HPI, has greatly expanded the text pertaining to the specialized oil-refining and petrochemical-processing applications. At the same time, API has retained and updated the information covering applications outside of the HPI (see Section 5) because of the similarities and applicability that this information has for refractory professionals in these other industries. Pages: 63

1st Edition | October 2018 | Product Number: C97901 | Price: $167.00

TR 980
Monolithic Refractories: Installation and Dryout

Covers the installation and dryout of monolithic refractory lining materials for hydrocarbon processing industry (HPI) applications. It discusses the best practice procedures and techniques used in the installation of refractory concrete, as well as those for air-and heat-setting plastics and ramming mixes. In addition, it discusses the need for curing and dryout and procedures to achieve successful results. This instruction is consistent with Std 936, which is the HPI industry standard for the installation quality control of monolithic refractories. It also serves as the body of knowledge document for the API 936 Refractory Personnel Certification Program. This report is the last in a series of three API reports covering the use of refractory concrete (castables), plastics, and ramming mixes for applications for the hydrocarbon processing industry. Its content is complemented by the two other reports in this series:

- API TR 978, *Monolithic Refractories: Manufacture, Properties and Selection*, and
- API TR 979, *Applications of Refractory Lining Materials*. Pages: 66

1st Edition | April 2018 | Product Number: G98001 | Price: $180.00

TR 981
Thermal Expansion Under Load and Creep of Refractories—An Evaluation and Comparison of Testing Methods

Documents the results of thermal expansion under load (TEUL) and creep in compression testing conducted by ASTM C832 and DIN 993-9 (same test as ISO 3187). The prime objective for this study is to determine if one or both tests should replace the ASTM C16 method. ASTM C16, modified from 1.5-hour to 100-hour hold, has been widely used to qualify brick for sulfur reaction furnace use. In addition to deformation after 100 hours, the creep tests will provide additional information of TEUL and evidence of mineralogical changes during their early life cycle in process operation. Pages: 28

1st Edition | March 2021 | Product Number: C98101 | Price: $101.00

RP 982
Inspection and Assessment of Refractory Linings

Provides recognized industry practices, requirements, and guidance for the installation, in-service inspection, and repair assessment of refractory lining installed into equipment that is used in general refinery services. Refinery equipment included in the scope of this standard includes, but may not be limited to, fluid solids units—including fluid catalytic cracker units (FCCUs), reforming units, fired heaters, incinerators, sulfur recovery units, flue gas ducts, calciners, steam-methane reformers (SMRs), cracker furnaces, boilers, hydrogen plant and transfer lines, and flue gas stacks. Pages: 71

1st Edition | October 2023 | Product Number: C98201 | Price: $174.00

PETROLEUM PRODUCTS AND PETROLEUM PRODUCT SURVEYS

API/NPRA Survey
Final Report: 1996 API/NPRA Survey of Refining Operations and Product Quality

A survey of industry refining data for the period May 1 through August 31, 1996. The report includes information on domestically produced gasoline and diesel product quality as well as aggregate domestic refining capacity and average operating data. Pages: 190

1st Edition | July 1997 | Product Number: F10001 | Price: $67.00
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Publ 4261
Alcohols and Ethers: A Technical Assessment of Their Application as Fuels and Fuel Components

Summarizes information from the technical literature on producing and applying alcohols and ethers as fuels and fuel components for the transportation sector. It assesses the technical advantages and disadvantages of alcohols and ethers with respect to hydrocarbon fuels. Since the amendment of the Clean Air Act in 1977, and subsequently in 1990, public interest in the role of oxygenates in transportation has significantly increased. This edition of 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: $176.00

Publ 4262
Methanol Vehicle Emissions

December 1990 | Product Number: F42620 | Price: $136.00

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PROCESS SAFETY STANDARDS

RP 752 ■
Management of Hazards Associated with Location of Process Plant Permanent Buildings

Provides guidance for managing the risks from process-related explosion, fire, and toxic material release hazards to personnel located in on-site buildings. This RP covers new and existing permanent buildings, as well as new and existing portable buildings (other than light wood trailers) intended for perpetual use (intended to be used for the life of the building or life of the process plant) in a specific, fixed location. Pages: 68

4th Edition | January 2024 | Product Number: C75204 | Price: $176.00

RP 753 ■
Management of Hazards Associated with Location of Process Plant Portable Buildings

Provides guidance for managing the risks from process-related explosion, fire, and toxic material release hazards to personnel located in on-site portable buildings. The document is based on the API 752 guidance for siting evaluations and the referenced documents concerning its technical aspects. For guidance on the evaluation of each hazard type, the reader should reference API 752. This document provides clarifications and alterations where necessary to address portable buildings. Pages: 66

2nd Edition | January 2024 | Product Number: C75302 | Price: $176.00

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 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. Pages: 134

3rd Edition | August 2021 | Product Number: K75403 | Price: $208.00

RP 755
Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries
(ANSI/API RP 755)

Provides guidance to all stakeholders (e.g. employees, managers, supervisors) on understanding, recognizing, and managing employee fatigue in the workplace. Should sites decide to use this document, the owners/operators shall establish policies and procedures to meet the purpose of this recommended practice.

This document was 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.

ANSI/API RP 755 applies to all employees working night shifts, rotating shifts, extended hours/days, or call outs who are 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: 17

2nd Edition | May 2019 | Product Number: K75502 | Price: $176.00

TR 755-1
Technical Support Document for ANSI/API RP 755, *Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries*

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, 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: $112.00

RP 756 ■
Management of Hazards Associated with Location of Process Plant Tents

Provides guidance for managing the risks from process-related explosion, fire, and toxic material release hazards to personnel located in on-site tents.The document is based on the API 752 guidance for siting evaluations and the refe of each hazard type, the reader should reference API 752. This document provides clarifications and alterations where necessary to address tents. Pages: 53

2nd Edition | January 2024 | Product Number: C75602 | Price: $164.00

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) to 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 process 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: $206.00

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

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HEALTH, 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 https://www.api.org

RP 751
Safe Operation of Hydrofluoric Acid Alkylation Units

Provides requirements (shall) and recommendations (should) for practices and procedures related to safety, operations, design, inspection, and maintenance to support the safe and reliable operation of hydrofluoric acid (HF) alkylation units. Topics include hazard management; operating procedures and worker protection; materials, construction, inspection, and work practices; transportation and inventory control; pressure-relief, product treatment, and utility systems; and risk mitigation. This document contains requirements and recommendations that have been found effective based on broad industry acceptance, proven effective industry practices, testing, and regulatory requirements. Pages: 181

5th Edition | August 2021 | Product Number: K75105 | Price: $223.00

Std 2350
Overfill Protection for Storage Tanks in Petroleum Facilities
(includes Errata 1 dated April 2021)
(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: 75

5th Edition | September 2020
Product Number: K235005 | Price: $154.00

HEALTH, ENVIRONMENT, AND SAFETY: SOIL AND GROUNDWATER

Publ 422
Groundwater Protection Programs for Petroleum Refining and Storage Facilities: A Guidance Document

Reflects continuing industry action and commitment to positively address groundwater protection by developing and implementing individual groundwater protection plans. Provides additional guidance to help petroleum facilities identify the types of issues that may need to be addressed in a groundwater protection plan. Intended to help refineries, terminals associated with transportation pipelines, product distribution terminals, and other downstream petroleum storage units develop groundwater protection plans that are tailored to their individual circumstances. Pages: 9

1st Edition | October 1994 | Product Number: C42201 | Price: $81.00

Publ 800
Literature Survey: Subsurface and Groundwater Protection Related to Petroleum Refinery Operations

This report is the principal product of an API-sponsored project to prepare a background basis for the development of further information on subsurface and groundwater protection at refineries. It contains an explanation of how the literature survey was conducted; annotations for pertinent articles; a discussion of applicable federal statutes and regulations; and annotations for pertinent regulatory programs under the 5 principal statutes that apply to refinery operations. Pages: 145

1st Edition | September 1988 | Product Number: C80000 | Price: $100.00

SECURITY

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 | Reaffirmed: February 2022
Product Number: K78001 | Price: $236.00

To purchase individual API standards, visit apiwebstore.org

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 supersede the requirements of any regulated facility but may be used as a reference document. Pages: 82

1st Edition | September 2016 | Product Number: K78101 | Price: $180.00

■ 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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UPSTREAM SAFETY STANDARDS

RP 54
Occupational Safety and Health for Oil and Gas Well Drilling and Servicing Operations
(includes Addendum 1 dated June 2021)

Recommends practices and procedures for promoting and maintaining safe and healthy working conditions for personnel in drilling and well servicing operations. These recommendations apply to rotary drilling rigs, well servicing rigs, and special services as they relate to operations on location. It is intended that the applicable requirements and recommendations of some sections of the standard be applied, as appropriate, to other sections. The recommendations are not intended to cover seismic drilling or water well drilling operations. These recommendations do not apply to site preparation and site remediation operations. Pages: 62

4th Edition | February 2019 | Product Number: G54004 | Price: $168.00

Std 65-2 ◆
Isolating Potential Flow Zones During Well Construction

Contains best practices for zone isolation in wells to prevent annular pressure and/or flow through or past pressure-containment barriers that are installed and verified during well construction. Well construction practices that may affect barrier sealing performance are mentioned along with methods to help ensure positive effects or to minimize any negative ones. The objectives of this guideline are two-fold. The first is to help prevent and/or control flows just prior to, during, and after primary cementing operations to install or "set" casing and liner pipe strings in wells. 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

2nd Edition | December 2010 | Reaffirmed: November 2016
Product Number: G65202 | Price: $162.00

You may download a PDF of this document from https://www.api.org/oil-and-natural-gas/wells-to-consumer/exploration-and-production/hydraulic-fracturing/65-2-isolating-potential-flow-zones

RP 65-3
Wellbore Plugging and Abandonment

Provides guidance for the design, placement, and verification of cement plugs in wells to be temporarily or permanently abandoned, as well as remediation and verification of annular barriers. Wells temporarily abandoned (suspended) are intended to be re-entered in the future. The placement of barriers may depend on whether the well is to be temporarily or permanently abandoned. Cement plug lengths are not considered in this document. Pages: 52

1st Edition | June 2021 | Product Number: G65301 | Price: $128.00

RP 67
Recommended Practice for Oilfield Explosives Safety

Applicable to chemical explosives used as an energy source to do work in oil- and gas-producing operations, and more specifically to explosives intended for use inside a wellbore. The purpose of this recommended practice (RP) is primarily to prevent the inadvertent initiation of these explosives at the wellsite but also includes some recommendations for safe and secure storage and transportation and handling, as well as requirements for design and manufacture of selected equipment.

While some chemicals intended for various nonexplosive applications can prove explosive when misused (such as lithium batteries), it is not the intent of this RP to address these materials. Pages: 85

3rd Edition | October 2019 | Product Number: G06703 | Price: $147.00

RP 74
Recommended Practice for Occupational Safety for Onshore Oil and Gas Production Operation

Recommends practices and procedures for promoting and maintaining safe working conditions for personnel engaged in onshore oil and gas production operations, including special services. Pages: 23

1st Edition | October 2001 | Reaffirmed: January 2013
Product Number: G74001 | Price: $77.00

RP 75
Safety and Environmental Management System for Offshore Operations and Assets

Provides companies engaged in offshore operations with a framework for the establishment, implementation, and maintenance of a Safety and Environmental Management System (SEMS) to manage and reduce risks associated with safety and the environment to prevent incidents and events.

This recommended practice applies, in part or whole, to companies engaged in offshore operations, from lease evaluation through decommissioning.

This document is not intended to be prescriptive or limiting on the expectations of each SEMS element; rather, it allows flexibility appropriate to the size, scope, and risk of a Company's assets and operations. It is advised that users of this document review and comply with applicable legal and regulatory requirements, and conform with applicable industry codes and standards.

Consideration may be given to using this document to help systematically manage other aspects of operations, such as security and health. Pages: 34

4th Edition | December 2019 | Product Number: G07504 | Price: $132.00

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: $37.00

To purchase individual API standards, visit apiwebstore.org

RP 75W ■
Safety and Environmental Management System for Offshore Wind Operations and Assets

Provides companies engaged in offshore operations in the offshore wind energy sector with a framework for the establishment, implementation, and maintenance of a Safety and Environmental Management System (SEMS) to manage and reduce risks associated with safety and the environment to prevent incidents and unplanned events. This recommended practice applies, in part or whole, to companies engaged in offshore operations, through the project life cycle.Pages: 32

1st Edition | July 2024 | Product Number: G75W01 | Price: $87.00

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: $71.00

MULTI-SEGMENT PUBLICATIONS

Firefighting Foam Transition Guidance

Provides the industry with suggestions and considerations for the transition from C8 legacy fluorinated foams concentrates to another type of foam concentrate [such as C6 or synthetic fluorine-free foam (SFFF)]. For each step of the MOC, a separate document is available that provides considerations and examples on how an entity may choose to execute the transition. While it is ideal to have a drop-in foam concentrate replacement with minimum changes in processes or practices to use during this transition, the MOC process plans for any changes that must be accounted for. Pages: 32

October 2020 | To obtain a copy of this report, please visit https://www.api.org/-/media/Files/Oil-and-Natural-Gas/Refining/Fire-fighting-Foam-Transition-Guidance-October-2020.pdf

RP 752 ■
Management of Hazards Associated with Location of Process Plant Permanent Buildings

Provides guidance for managing the risks from process-related explosion, fire, and toxic material release hazards to personnel located in on-site buildings. This RP covers new and existing permanent buildings, as well as new and existing portable buildings (other than light wood trailers) intended for perpetual use (intended to be used for the life of the building or life of the process plant) in a specific, fixed location. Pages: 68

4th Edition | January 2024 | Product Number: C75204 | Price: $176.00

RP 753 ■
Management of Hazards Associated with Location of Process Plant Portable Buildings

Provides guidance for managing the risks from process-related explosion, fire, and toxic material release hazards to personnel located in on-site portable buildings. The document is based on the API 752 guidance for siting evaluations and the referenced documents concerning its technical aspects. For guidance on the evaluation of each hazard type, the reader should reference API 752. This document provides clarifications and alterations where necessary to address portable buildings. Pages: 66

2nd Edition | January 2024 | Product Number: C75302 | Price: $176.00

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 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. Pages: 134

3rd Edition | August 2021 | Product Number: K75403 | Price: $208.00

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2nd Edition | May 2019 | Product Number: K75502 | Price: $176.00

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1st Edition | April 2010 | Product Number: K755101 | Price: $112.00

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1st Edition | September 2014 | Product Number: C756101 | Price: $206.00

Publ 770
A Manager's Guide to Reducing Human Errors—Improving Human Performance in the Process Industries

Intended for an audience of middle managers to senior executives who have different levels of knowledge about human factors engineering. It is designed to equip them with a basic understanding of the causes of human errors and to suggest ways for reducing human errors at individual facilities. It also describes how to incorporate human reliability analysis (HRA) into process safety management activities. Pages: 85

1st Edition | March 2001 | Product Number: K77001 | Price: $82.00

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 | Reaffirmed: February 2022
Product Number: K78001 | Price: $236.00

RP 2001
Fire Protection in Refineries
(includes Addendum 1 dated October 2024)

Provides a better understanding of refinery fire protection and the steps needed to promote the safe storage, handling, and processing of petroleum and petroleum products in refineries. A basic premise of this standard is that fire prevention provides the fundamental foundation for fire protection.

This publication 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, standards, or governmental requirements. Pages: 90

10th Edition | July 2019 | Product Number: C200110 | Price: $217.00

To purchase individual API standards, visit apiwebstore.org

RP 2003
Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents

Presents the current state of knowledge and technology in the fields of static electricity, and stray currents applicable to the prevention of hydrocarbon ignition in the petroleum industry and is based on both scientific research and practical experience. The principles discussed in this recommended practice are applicable to other operations where ignitable liquids and gases are handled. Their use should lead to improved safety practices and evaluations of existing installations and procedures. Pages: 76

8th Edition | September 2015 | Reaffirmed: March 2020
Product Number: K20038 | Price: $236.00

RP 2009
Safe Welding, Cutting, and Hot Work Practices in the Petroleum and Petrochemical Industries

Provides information to assist in the safe performance of welding, cutting, and other hot work activities to be done safely in petroleum and petrochemical operations. The understanding of potential hazards, and application of this knowledge, can help reduce the probability and severity of incidents and the risk of harmful health effects from those activities. Personnel engaged in hot work should have a comprehensive understanding of the potential hazards associated with the activity and materials involved. RP 2009 was updated to include added precautions to prevent fires and incidents during welding operations, as well as an awareness of the hazards of inhalation of welding fumes. Additionally, it includes specific guidance to evaluate procedures for certain types of work equipment in service, supports UN Sustainable Development Goal #9 for Resilient Infrastructure, and is included in the U.S. Department of Labor OSHA's resources materials for Process Safety Management. Pages: 43

8th Edition | March 2022 | Product Number: K20098 | Price: $120.00

RP 2027 ■
Ignition Hazards and Safe Work Practices for Abrasive Blasting of Atmospheric Storage Tanks in Hydrocarbon Service

Provides safe work practices for the prevention and control of vapor, ignition, and other potential hazards during abrasive blasting of aboveground storage tanks in liquid hydrocarbon service at atmospheric pressure. It is generally recognized in the petroleum industry that the preferable method is to empty, vapor-free, and clean aboveground petroleum storage tanks before starting abrasive blasting work. However, this may not be practical or even possible and may increase the risk of an undesirable hazard or incident in some situations. It is, therefore, necessary to understand the potential ignition and safety hazards when planning abrasive blasting and to implement the appropriate safeguards before starting this work. Pages: 27

5th Edition | September 2024
Product Number: C202705 | Price: $162.00

RP 2028
Flame Arresters in Piping Systems

Covers the use and limitations of flame arresters installed in piping systems in the petroleum and petrochemical industries. It provides a general overview of flame arresters currently in use and some potential concerns or limitations. Applicable combustion and flame propogation parameters are discussed including the distinction between arresting flames versus arresting detonations. Pages: 12

3rd Edition | February 2002 | Reaffirmed: December 2010
2-Year Extension: February 2015 | Product Number: K20283 | Price: $75.00

RP 2030
Application of Fixed Water Spray Systems for Fire Protection in the Petroleum and Petrochemical Industries

Provides guidance for the petroleum industry and some petrochemical industry applications (for non-water-reactive petrochemicals with physical and combustion characteristics comparable to hydrocarbons) in determining where water spray systems might be used to provide protection from fire damage for equipment and structures. Pages: 21

4th Edition | September 2014 | Product Number: K20304 | Price: $130.00

RP 2201
Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries

Provides information to assist in safely conducting hot tapping operations on equipment in service in the petroleum and petrochemical industries. No document can address all situations nor answer all potential questions; however, the understanding of potential hazards, and application of this knowledge, can help reduce the probability and severity of incidents. Pages: 27

5th Edition | June 2003 | Reaffirmed: March 2020
2-Year Extension: February 2015 | Product Number: K22015
Price: $108.00

RP 2210
Flame Arresters for Vents of Tanks Storing Petroleum Products

Discusses the benefits and detriments associated with the use of flame arresters on vents utilized on atmospheric fixed-roof tanks. Pages: 4

3rd Edition | June 2000 | Reaffirmed: March 2020
Product Number: K22103 | Price: $81.00

RP 2217A
Safe Work in Inert Confined Spaces in the Petroleum and Petrochemical Industries

Covers design, materials, face-to-face dimensions, pressure-temperature ratings, and examination, inspection, and test requirements for two types of check valves:

- Type 'A' check valves are short face-to-face and can be: wafer, lug, or double flanged; single plate or dual plate; gray iron, ductile iron, steel, nickel alloy, or other alloy designed for installation between Classes 125 and 250 cast iron flanges as specified in ASME B16.1, between Classes 150 and 300 ductile iron flanges as specified in ASME B16.42, between Classes 150 and 2500 steel flanges as specified in ASME B16.5, and between Classes 150 and 600 steel pipeline flanges as specified in MSS SP-44 or steel flanges as specified in ASME B16.47.
- Type 'B' bolted cover swing check valves are long face-to-face as defined in 5.1.2 and can be: flanged or buttwelding ends of steel, nickel alloy, or other alloy material. End flanges shall be as specified in ASME B16.5 or ends shall be butt-welding as specified in ASME B16.25. Pages: 34

5th Edition | July 2017 | Product Number: K2217A5 | Price: $180.00

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 scenarios in on-shore processing plants. Pages: 60

3rd Edition | July 2013 | Reaffirmed: March 2020
Product Number: K22183 | Price: $199.00

■ 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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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 | Reaffirmed: October 2024
Product Number: K22194 | Price: $204.00

Publ 2375
1996 Summary of U.S. Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

This annual summary reports on cases recordable in 1996 under the U.S. Bureau of Labor Statistics' recordkeeping guidelines. The survey is based on data submitted to the American Petroleum Institute by 176 oil and gas companies, employing 285,885 persons. The report includes information regarding injuries, illnesses, fatalities, lost workday cases, and incidence rates by function.

June 1997 | Product Number: K23751 | Price: $104.00

Publ 2376
1997 Summary of U.S. Occupational Injuries, Illness, and Fatalities in the Petroleum Industry

June 1998 | Product Number: K23761 | Price: $104.00

Publ 2377
1998 Summary of U.S. Occupational Injuries, Illness, and Fatalities in the Petroleum Industry

March 1999 | Product Number: K23771 | Price: $104.00

Publ 2378
1999 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

June 2000 | Product Number: K23781 | Price: $112.00

Publ 2379
2000 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2001 | Product Number: K23790 | Price: $112.00

Publ 2380
2001 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2002 | Product Number: K23801 | Price: $112.00

Publ 2381
2002 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

June 2003 | Product Number: K23811 | Price: $112.00

Publ 2382
2003 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

May 2004 | Product Number: K23821 | Price: $112.00

Publ 2383
2004 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2005 | Product Number: K23831 | Price: $112.00

Publ 2384
2005 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

This annual summary reports on cases recordable in 2005 under the US Bureau of Labor Statistics' record keeping guidelines. The survey is based on data submitted to the American Petroleum Institute by oil and gas companies. The report includes information regarding injuries, illness, and fatalities, lost workday cases, and incidence rates by function.

May 2006 | Product Number: K23841 | Price: $112.00

Publ 2385
2006 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

June 2007 | Product Number: K23851 | Price: $112.00

Publ 2386
2007 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

May 2008 | Product Number: K23861 | Price: $112.00

Publ 2387
2008 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2009 | Product Number: K23871 | Price: $112.00

Publ 2388
2009 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

Reports on cases recordable in 2009 under the U.S. Bureau of Labor Statistics' recordkeeping guidelines. The survey is based on data submitted to API by oil and gas companies. The report includes information regarding injuries, illness, and fatalities, lost workday cases, and incidence rates by function.

April 2010 | Product Number: K23881 | Price: $112.00

1989 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

January 1989 | Product Number: K19996 | Price: $64.00

1990 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

July 1991 | Product Number: K19988 | Price: $89.00

1991 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

September 1992 | Product Number: K19987 | Price: $89.00

1992 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

August 1993 | Product Number: K19986 | Price: $89.00

1993 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

June 1994 | Product Number: K19985 | Price: $104.00

1994 Summary of U.S. Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

June 1995 | Product Number: K19984 | Price: $104.00

1995 Summary of U.S. Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

May 1996 | Product Number: K19983 | Price: $104.00

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

2nd Edition | December 1996 | Reaffirmed: December 2015
Product Number: K2510A | Price: $118.00

STORAGE TANK SAFETY STANDARDS

Std 2015 ◆■

Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks

Applies to stationary atmospheric low-pressure [up to and including 103 kPA (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. Pages: 152

9th Edition | August 2024 | Product Number: K201509 | Price: $293.00

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 tank fire prevention. If fires do occur, this information can help responders optimize fire suppression techniques to reduce the severity of an incident and reduce the potential for escalation. Pages: 83

4th Edition | May 2001 | Reaffirmed: March 2020
Product Number: K20214 | Price: $166.00

RP 2026 ◆

Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service

Addresses the hazards associated with access/egress onto external and internal floating roofs of in-service petroleum storage tanks and identifies some of the most common practices and procedures for safely accomplishing this activity. This RP is intended primarily for those persons who are required to perform inspection, service, maintenance, or repair activities that involve descent onto floating roofs of in-service petroleum tanks. Pages: 28

4th Edition | July 2022 | Product Number: K202604 | Price: $126.00

RP 2207 ◆

Preparing Tank Bottoms for Hot Work

Addresses only the safety aspects of hot work performed 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. RP 2009 provides more in-depth information on safe hot work practices, and its requirements are not duplicated here. Pages: 28

8th Edition | April 2022 | Product Number: K22078 | Price: $140.00

Std 2350

Overfill Protection for Storage Tanks in Petroleum Facilities (includes Errata 1 dated April 2021) (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: 75

5th Edition | September 2020
Product Number: K235005 | Price: $154.00

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Air Research

EMISSIONS: GENERAL

Carbon Dioxide (CO_2) Emergency Response Tactical Guidance Document

This field operations guide is not an educational or decision-making tool. This guide contains a set of operational tools and references to assist in the response to a pipeline release of carbon dioxide (CO_2). The priorities for CO_2 response are people (safety of response personnel and the public); environment (prevention of environmental, human health, and welfare effects); assets (minimizing damage to structures and equipment); and relations (keep customers, community, and federal, state, and local government agencies informed). Pages: 33

1st Edition | August 2023 | You may download a PDF of this document from https://www.api.org/-/media/files/policy/carbon-capture/co2-tactical-guidance

API Guidance Document for GHG Reporting

Drives consistency of voluntary reporting by individual oil and natural gas companies of a core set of company-wide GHG indicators. This is intended to enhance comparability across company-by-company climate-related reporting in the oil and natural gas industry, in order to provide decision useful information to the financial sector, policy makers, industry customers, and other stakeholders. Pages: 40

1st Edition | March 2022 | You may download a PDF of this document from https://www.api.org/-/media/Files/Policy/ESG/GHG/Guidance-API-Template-for-Climate-related-Reporting-Initiative-March-2022.pdf

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

August 2009 | Available for download at https://www.api.org/~/media/files/ehs/climate-change/2009_ghg_compendium.ashx

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: $65.00

Publ 326
The Cost Effectiveness of VOC and NO_x 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 NO_x. 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: $160.00

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: $98.00

Publ 342 and Publ 343
Fugitive Emissions from Equipment Leaks I: Monitoring Manual and Fugitive Emissions from Equipment Leaks II: Calculation Procedures for Petroleum Industry Facilities

A number of federal, state, and local regulations are designed to control fugitive emissions of volatile organic compounds 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: $69.00
Product Number for Publ 343: J34300 | Price: $69.00

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: $80.00

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Publ 348

Air Toxics Emission Factors for Combustion Sources Using Petroleum-Based Fuels, Volume 1—Development of Emission Factors Using API/WSPA Approach

This project was performed with the cooperation of the California Air Resources Board (CARB) and Western States Petroleum Association to develop updated air toxic emission factors for combustion sources using petroleum-based fuels. The emission factors developed using the best available source testing information in this project will help 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: $109.00

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: $95.00

Publ 4703

Gas Fired Boiler—Test Report Site A: Characterization of Fine Particulate Emission Factors and Speciation Profiles from Stationary Petroleum Industry Combustion Sources

In 1997, the U.S. Environmental Protection Agency (EPA) promulgated new ambient air standards for particulate matter (PM) smaller than 2.5 micrometers in diameter (PM 2.5). Source emissions data are needed to assess the contribution of petroleum industry combustion sources to ambient PM 2.5 concentrations. This report presents particulate measurement results from a 550,000 pounds per hour steam boiler firing refinery process gas. The particulate stack measurements were made using both a dilution tunnel research test method and traditional EPA sampling methods. Pages: 119

July 2001 | Product Number: I47030 | Price: $96.00

Publ 4704

Gas Fired Heater—Test Report Site B: Characterization of Fine Particulate Emission Factors and Speciation Profiles from Stationary Petroleum Industry Combustion Sources

In 1997, the U.S. Environmental Protection Agency (EPA) promulgated new ambient air standards for particulate matter (PM) smaller than 2.5 micrometers in diameter (PM 2.5). Source emissions data are needed to assess the contribution of petroleum industry combustion sources to ambient PM 2.5 concentrations. This report presents particulate measurement results from a 114 million British thermal unit (MMBtu) per hour gas-fired refinery process heater. The particulate stack measurements were made using both a dilution tunnel research test method and traditional EPA sampling methods. Pages: 118

August 2001 | Product Number: I47040 | Price: $96.00

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 promulgated new ambient air standards for particulate matter (PM) smaller than 2.5 micrometers in diameter (PM 2.5). Source emissions data are needed to assess the contribution of petroleum industry combustion sources to ambient PM 2.5 concentrations. This report presents that the gas fired steam generator has a maximum heat input of 62.5 MMBtu/Hr with an average rate of approximately 50 MMBtu/hr. Pages: 100

July 2001 | Product Number: I47120 | Price: $90.00

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: $100.00

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 NO_x, SO_2, and CO remain in the vapor phase during and after combustion and are relatively simple to measure, particulate matter (PM) measurements are much more challenging. This is because while some PM such as fly ash or catalytic cracking catalyst fines is clearly solid material that is readily collected and measured on a sampling filter, other species that may exist in the vapor phase during combustion can later condense into aerosols downstream from the combustion zone. This can occur before or after any control devices, depending upon the temperature and composition of the combustion gases. Consequently, it has been customary to refer to PM as being composed of two PM components, filterable and condensable, the relative amounts of each depending on the stack gas composition and temperature, control devices in use at the unit, and the method for measuring PM. While measuring filterable PM is relatively straightforward (i.e. PM collected on a filter), condensable PM is a more esoteric quantity and its contribution to total PM emissions is very much dependent upon the choice of the measurement method. The U.S. Environmental Protection Agency apparently recognized this issue, and until the interest in measuring and controlling PM 2.5 emissions emerged in the 1990s, their PM sampling methods were centered on measuring only filterable PM. At the time that these methods were originally instituted, the best available pollution control devices were mainly limited to filterable PM and could not control the condensable portion of PM emissions. As interest in the health effects associated with PM emissions increased, efforts were centered on determining the contribution of the PM 2.5 fraction that was believed to most responsible for these effects and principally composed of condensable matter. This report will review the conditions leading to the formation of condensable particulate matter from stack gas components along with the methods used to measure PM emissions from refinery combustion sources. Pages: 27

September 2008 | Product Number: I47720 | Price: $68.00

■ This publication is a new entry in this catalog.

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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 bio-attenuation will occur under a variety of scenarios and provide insight into site conditions that will result in significant biodegradation. This improved understanding may be used to select site-specific attenuation factors for degradable compounds and develop soil vapor screening levels appropriate for particular combinations of source concentrations, source depth, and building characteristics, which should be defined as part of a site conceptual model. Pages: 53

April 2009 | Product Number: I47750 | Price: $117.00

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: $116.00

EMISSIONS: EXPLORATION AND PRODUCTION

Publ 4589
Fugitive Hydrocarbon Emissions from Oil and Gas Production Operations

The emission factors derived in this report indicate that fugitive emissions from production facilities are considerably lower than they were in the late 1970s. Investigators use portable detectors to screen more than 180,000 components at 20 offshore and onshore facilities. Mass emission rates from "bagged" emitters, valves, connectors, and other components, such as seals and vents, are used to develop emission factors for individual components and groups of components. A workbook included in the report provides site operators with three different options to calculate emissions from their facilities. See also Publ 4615. Pages: 263

December 1993 | Product Number: I45890 | Price: $154.00

Publ 4615
Emission Factors for Oil and Gas Production Operation

Supplements the information found in Publ 4589 and contains revised emission factors developed from 1993 API data using correlation equations established by the U.S. Environmental Protection Agency in 1994. The report contains emissions factors for five types of production operations—light crude production, heavy crude production, gas production, gas processing plants, and offshore production. It also contains profiles of speciated emissions including air toxics and assesses regional differences in fugitive emissions and control efficiency of inspection and maintenance programs. Component inventory data, screening data, and leak emission data are also included. See also Publ 4589. Pages: 56

January 1995 | Product Number: I46150 | Price: $67.00

Publ 4638
Calculation Workbook for Oil and Gas Production Equipment Fugitive Emissions

This workbook, which is the result of five years of field testing of equipment components at production facilities across the United States, is a valuable tool for petroleum producers who are interested in estimating fugitive emissions from their oil and gas production sites. Four methods of calculating fugitive emissions are presented: EPA average emission factor method, EPA screening value range emission method, EPA correlation method, and leak quantification method. Pages: 62

July 1996 | Product Number: I46380 | Price: $67.00

Publ 4661
Exploration and Production Emission Calculator II (EPEC II) User's Guide

The Exploration and Production Emission Calculator Version 2.0 (EPEC II) is a software tool that can be used to estimate emissions for exploration and production facilities. EPEC II integrates user inputs, emission calculations, and data summaries for many equipment types common to exploration and production facilities. The calculation techniques and emission factors utilized by the EPEC II software were, in most cases, established by the U.S. Environmental Protection Agency, API, and the Gas Research Institute. Published references that provide background information for the calculation methods used in EPEC II are given for each equipment type in both the software and in each section of this user's guide. Pages: 96

2nd Edition | January 2007 | Product Number: I46610 | Price: $136.00

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: $128.00

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: $535.00

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: $131.00

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: $86.00

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.

API has discontinued the sale of E&P Tanks v3.0; no new licenses for the software will be issued.

Existing customers should contact support@eptanks.com for assistance in transferring an existing E&P Tanks v3.0 license from one user to another user.

API will continue to offer support for existing customers who encounter errors inputting data into software in accordance with E&P Tanks user guide (Publication 4697).

(Note that API provides no support for earlier versions of E&P Tanks.)

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: $134.00

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: $124.00

EMISSIONS: REFINING

Validation of Heavy Gas Dispersion Models with Experimental Results of the Thorney Island Trials
Volumes I & II
June 1986

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: $76.00

Publ 4677
Fugitive Emissions from Refinery Process Drains, Volume I, Fugitive Emission Factors for Refinery Process Drains

Emissions from refinery process drains are under increasing scrutiny, particularly with regard to volatile organic compounds (VOCs) and hazardous air pollutants 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: $105.00

To purchase individual API standards, visit apiwebstore.org

Publ 4678

Fugitive Emissions from Refinery Process Drains, Volume II, Fundamentals of Fugitive Emissions from Refinery Process Drains

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: $105.00

Publ 4681

Fugitive Emissions from Refinery Process Drains, Volume III, Process Drain Emission Calculator: APIDRAIN Version 1.0

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: $446.00

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: $157.00

Publ 4723-A

Refinery Stream Composition Data—Update to Speciation Data in API 4723

Since the publication of API 4723 in 2002, new regulatory requirements have resulted in many changes in refinery processes that may have altered process stream compositions. Changing feedstocks, new process additives, and new catalysts may also have affected the concentrations of chemical species present in specific process streams.

Based on an assessment of the range and depth of more recent stream speciation data, the Petroleum Environmental Research Forum (PERF) elected to update the stream speciation profiles in API 4723 using more recent composition sampling. The updated profiles are provided in this report. PERF members believe that the newer data are more representative due to improved sampling and analytical techniques and that these newer analyses better reflect changes in refinery operations over recent years.

A large database of records was collated for the current study, representing information from 25 refineries.

The original study reported on 24 chemical species and the current study provides data on 89 species. The original study reported on 65 refinery process streams and the current project provides data on 68 process streams.

The material contained in this report will be of use in estimating the emissions of specific chemical species, preparing permit applications, and performing other environmental assessments. API, PERF, and the project participants make no claims as to the suitability or acceptability of the stream composition data reported herein for specific reporting or regulatory purposes. Pages: 278

December 2018 | Product Number: I4723A | Price: $158.00

EMISSIONS: VEHICLES

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: $141.00

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: $105.00

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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: $86.00

Publ 4622
Petroleum Industry Data Characterizing Occupational Exposures to Methyl Tertiary Butyl Ether (MTBE): 1983–1993

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: $67.00

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 ttertiary 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: $71.00

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 ICU Environmental Health and Safety. Of the 271 total samples, 63 samples were at or above the Occupational Safety and Health Administration (OSHA) action level of 2.5 $\mu g/m^3$ and 51 were at or above the OSHA permissible exposure limit of 5 $\mu g/m^3$. Pages: 12

June 2007 | Product Number: I46290 | Price: $93.00

MODELING

Publ 4546
Hazard Response Modeling Uncertainty (a Quantitative Method): Evaluation of Commonly-Used Hazardous Gas Dispersion Models—Volume 2

Contains an evaluation of a group of 14 hazardous gas dispersion models. All available measurement programs were considered for the evaluation, covering both the releases of dense gases and nondense tracer gases; eight data sets are used in the evaluation. The models are reviewed for their scientific validity. Statistical procedures and residual plots are used to characterize performance. A number of the models give predictions that reasonably match field data. Pages: 351

October 1992 | Product Number: I45460 | Price: $154.00

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: I46280 | Price: $154.00

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 $45.00, please contact the Intellectual Property Department at API, 1200 Massachusetts Avenue NW, Suite 1100, Washington, DC 20001-5571; 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: $90.00

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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: $122.00

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 O_3 episodes. Plausible alternative conditions were established to define acceptable base cases, some of which provided model performance comparable to the best achieved for the episodes. The alternative base cases used in this study produced significant differences in estimates of the air quality benefits of hypothetical emissions reductions. The study strongly recommends that current photochemical modeling practices include this type of analysis to reduce the risk of focusing on the wrong ozone precursor, underestimating control requirements, or incurring costs to implement unnecessary controls. Pages: 364

September 1994 | Product Number: I46160 | Price: $149.00

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: K19996 | Price: $64.00

1990 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

July 1991 | Product Number: K19988 | Price: $89.00

1991 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

September 1992 | Product Number: K19987 | Price: $89.00

1992 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

August 1993 | Product Number: K19986 | Price: $89.00

1993 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

June 1994 | Product Number: K19985 | Price: $104.00

1994 Summary of U.S. Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

June 1995 | Product Number: K19984 | Price: $104.00

1995 Summary of U.S. Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

May 1996 | Product Number: K19983 | Price: $104.00

Publ 2375
1996 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

June 1997 | Product Number: K23751 | Price: $104.00

Publ 2376
1997 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

June 1998 | Product Number: K23761 | Price: $104.00

Publ 2377
1998 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

March 1999 | Product Number: K23771 | Price: $104.00

Publ 2378
1999 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only

June 2000 | Product Number: K23781 | Price: $112.00

Publ 2379
2000 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only

March 2001 | Product Number: K23790 | Price: $112.00

Publ 2380
2001 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only

March 2002 | Product Number: K23801 | Price: $112.00

Publ 2381
2002 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only

June 2003 | Product Number: K23811 | Price: $112.00

Publ 2382
2003 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only

May 2005 | Product Number: K23821 | Price: $112.00

Publ 2383
2004 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only

March 2005 | Product Number: K23831 | Price: $112.00

Publ 2384
2005 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only

May 2006 | Product Number: K23841 | Price: $112.00

Publ 2385
2006 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only

June 2007 | Product Number: K23851 | Price: $112.00

Publ 2386
2007 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only

May 2008 | Product Number: K23861 | Price: $112.00

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Publ 2387
2008 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only

March 2009 | Product Number: K23871 | Price: $112.00

Publ 2388
2009 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only

April 2010 | Product Number: K23881 | Price: $112.00

Publ 4714
A Guide to Polycyclic Aromatic Hydrocarbons for the Non-Specialist

Provides an introduction to polycyclic aromatic hydrocarbons (PAHs) for persons working in the petroleum industry. It describes in general terms what PAHs are and how they are formed; PAH environmental transport, fate, and health effects; regulatory requirements related to PAHs; and analytical methods for measuring PAH concentrations in the environment. This information is of particular relevance to the petroleum industry due to the natural presence of PAHs in crude oil, the formation of PAHs during some refining processes, and the potential for production of PAHs during the combustion of petroleum products. The intended audience for this report includes environmental professionals who must address PAH regulatory issues and field personnel who are responsible for the sampling and analyses of PAHs. Pages: 36

February 2002 | Product Number: I47141 | Price: $86.00

Human Health Related Research

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: $67.00

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: $95.00

TR 403
Closed-Patch Repeated Insult Dermal Sensitization Study of TAME in Guinea Pigs

Describes a study to evaluate the allergic contact sensitization potential of tert-amyl methyl ether (TAME) in guinea pigs. Observations for mortality were made daily. Body weights were obtained and general health monitored weekly. Dermal evaluations were made approximately 24 and 48 hours after exposure. Pages: 32

February 1995 | Product Number: I00403 | Price: $67.00

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: $86.00

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: $67.00

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: $67.00

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 abberations in CHO cells. Pages: 56

December 1996 | Product Number: I00410 | Price: $95.00

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: 46

December 1996 | Product Number: I00411 | Price: $95.00

■ 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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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: $105.00

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: $86.00

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: $67.00

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: $86.00

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 scfromheduled 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: $86.00

Publ 4648

Human Neurobehavioral Study Methods: Effects of Subject Variables on Results

Behavioral tests from two consensus neurotoxicity batteries were administered to 715 subjects aged 26–45. These people had 0–18 years of education and represented the following cultural groups: European-descent majority, Native American Indian, African American, and Latin American. Differences in educational level and locale (rural vs. urban) and gender were examined. All factors affected the outcome of the behavioral tests studied. Results suggested that education and cultural group should be controlled in the design of the study rather than in the statistical analysis, and failure to do so could lead to false conclusions about the presence or absence of neurotoxic effects. Pages: 110

December 1996 | Product Number: I46480 | Price: $105.00

Publ 4689

Chemical Human Health Hazards Associated with Oil Spill Response

Contains an overview of human health hazards that could be encountered by personnel involved with spills or leaks of petroleum products. The discussion includes potential risks of basic components and products of concern. Environmental factors that may affect exposure and a brief summary of other exposure considerations are also included. Pages: 51

August 2001 | Product Number: I46890 | Price: $90.00

Publ 4743

Hazard Narrative for Tertiary-Butyl Alcohol (TBA), CAS Number 75-65-0

The purpose of this investigation was to conduct a quantitative risk assessment according to U.S. Environmental Protection Agency guidelines in which data on the mode of action by which TBA induced renal tumors in rats and thyroid tumors in mice was considered. When data from animal studies, such as the TBA bioassays, are extrapolated to humans to provide estimates of lifetime cancer risks, then potential differences in pharmacokinetics (metabolism) and pharmacodynamics (sensitivity and mode of action) between the animal species and humans is considered in the estimation of human equivalent doses and in extrapolation from high doses typically used in the animal bioassays to low doses to which humans may be potentially exposed. Pharmacokinetic, toxicity, and mode of action data for TBA were reviewed and data selected for quantitative dose-response modeling. Pages: 76

November 2005 | Product Number: I47430 | Price: $161.00

Publ 45592

Results of Toxicological Studies Conducted for the American Petroleum Institute Health and Environmental Sciences Department

Lists and provides the results through December 1994 of all toxicological studies performed on petroleum-based materials, including gasoline and gasoline streams, middle distillates, lubes, heavy fuels, solvents, shale oils, and miscellaneous products. It also provides details of the tests performed and the species tested. A three-ring binder is provided to house this edition and future updates. Pages: 190

January 1995 | Product Number: I45592 | Price: $86.00

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Natural Resource Damage Assessment

Publ 304
Evaluation of Restoration Alternatives for Natural Resources Injured by Oil Spills

Builds upon previous work in the field of oil spill impact assessment and habitat restoration to assess the technical feasibility and practicality of proactive restoration following oil spills and presents an approach for evaluating tradeoffs between natural recovery and active restoration. The scenarios developed to represent a broad spectrum of possible oil spills were based on selected case studies. The report concludes that in general, available restoration techniques are not very effective for enhancing natural recovery and may, in certain cases, cause more severe impacts than the oil spill alone. Pages: 171

1st Edition | October 1991 | Product Number: J30400 | Price: $90.00

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: $65.00

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: $151.00

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 crudes and oil products in aquatic environments. Some 748 toxicity values for fish, invertebrates, and algae are assembled into a database—OILTOX. LC50 values can be identified as well as information on taxonomic groups and toxicity endpoints of interest. Key methodological aspects of toxicity tests can be made as well as determinations of which test procedures have a significant impact on results. Users need 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: $128.00

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: $80.00

Publ 302
Waste Minimization in the Petroleum Industry: A Compendium of Practices

In early 1988, API undertook a project to develop a compendium of the waste minimization practices for several different segments of the petroleum industry. The compendium discusses a large variety of practices that can and are being utilized by the industry to reduce both the volume and toxicity of wastes. From "good housekeeping practices" for marketing facilities to the recycling of solvents, stormwater, and other traditional waste streams at refineries, the compendium illustrates the various practices available to minimize wastes in the industry. Pages: 152

November 1991 | Product Number: J30200 | Price: $98.00

Publ 303
Generation and Management of Wastes and Secondary Materials: 1989 Petroleum Refining Performance

This report is a follow-up to Publ 300 and documents the results of the 1989 Refining Solid Waste Survey. The quantitative results of the generation of the 28 waste and residual streams and their management according to the environmental management hierarchy (i.e. source reduction, recycling, treatment, and disposal) is presented. In addition, the document contains a discussion of the state of source reduction activities underway within the industry, including a quantitation of source reduction achievements on the 28 streams, and the methods used to calculate source reduction. Pages: 93

June 1992 | Product Number: J30300 | Price: $98.00

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: $160.00

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: $63.00

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*

■ This publication is a new entry in this catalog.

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

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 1990 Survey

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: $97.00

Publ 329
Generation and Management of Residual Materials: Petroleum Refining Performance 1991 Survey

This document is the fourth in a series that describes the 1991 data from API's annual survey of the types and amounts of residual materials generated and managed by the refining industry. In 1991, the industry generated 14.8 million wet tons of residual materials—the smallest quantity generated since API began this collection effort in 1987. The industry also reported that pollution prevention activities accounted for a reduction in 715,000 wet tons of materials. A trend analysis was performed on the last five years. Oil companies can use the data in this report to compare their residual generation and management practices with the rest of the industry. Pages: 172

June 1994 | Product Number: J32900 | Price: $109.00

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: $69.00

Publ 333
Generation and Management of Residual Materials

This report is the fifth in a series of reports detailing waste and residual and management practices in the refining sector. It presents the results of the 1992–1993 survey and includes information on how the industry has achieved compliance with the land disposal restrictions on 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: $109.00

Publ 336
Management of Residual Materials: 1994, Petroleum Refining Performance

This report is the sixth in a series of reports presenting the results of the API Annual Refining 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: $109.00

Publ 339
Management of Residual Materials: 1995, Petroleum Refining Performance

This report is the seventh in a series of reports presenting the results of the API Annual Refining Residual Survey. Included in the report are detailed assessments of generated quantities and management practices for 14 individual and 2 combined residual streams, trends in management practices, average costs for selected residual stream management, types of wastewater treatment systems employed at refineries, pollution prevention activities, refinery capacities, and regions in which refineries are located. The data in this report indicate a decrease of greater than 25 % 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: $109.00

Publ 345
Management of Residual Materials: 1996 Petroleum Refining Performance

This report is the eighth in a series of reports presenting the results of the API Annual Refining Residual Survey. Included in the report are detailed assessments of generated quantities and management practices for 14 residual streams representing approximately 80 % 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: $109.00

Soil and Groundwater Research

https://www.api.org/oil-and-natural-gas/environment/clean-water/ground-water

Publ 4722
Groundwater Sensitivity Toolkit—Users Guide, Version 1.0

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: $65.00

To purchase individual API standards, visit apiwebstore.org

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 https://www.api.org/oil-and-natural-gas/environment/clean-water/ground-water/bulletins

Bulletin No. 1
Summary of Processes, Human Exposures and Remediation Technologies Applicable to Low Permeability Soils
September 1996

Bulletin No. 3
Ten Frequently Asked Questions About MTBE in Water
March 1998

Bulletin No. 5
Evaluation of Sampling and Analytical Methods for Measuring Indicators of Intrinsic Bioremediation
March 1998

Bulletin No. 8
Characteristics of Dissolved Petroleum Hydrocarbon Plumes: Results from Four Studies
December 1998

Bulletin No. 9
Non-Aqueous Phase Liquid (NAPL) Mobility Limits in Soil
June 2000

Bulletin No. 10
Simulation of Transport of Methyl Tert-Butyl Ether (MTBE) to Ground-Water from Small-Volume Releases of Gasoline in the Valdose Zone
June 2000

Bulletin No. 11
Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE
August 2000

Bulletin No. 12
No-Purge Sampling: An Approach for Long-Term Monitoring
October 2000

Bulletin No. 13
Dissolution of MTBE from a Residually Trapped Gasoline Source
September 2001

Bulletin No. 14
Predicting the Effect of Hydrocarbon and Hydrocarbon-Impacted Soil on Groundwater
September 2001

Bulletin No. 15
Vadose Zone Natural Attenuation of Hydrocarbon Vapors: An Emperical 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
June 2018

Bulletin No. 19
Evaluation of Small-Volume Releases of Ethanol-Blended Gasoline at UST Sites
October 2003

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

■ 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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CONTAMINANT FATE AND TRANSPORT

Publ 4531
Chemical Fate and Impact of Oxygenates in Groundwater: Solubility of BTEX from Gasoline-Oxygenate Mixtures

Oxygenated hydrocarbon compounds may be added to gasoline mixtures to improve emission quality and octane ratings or to conserve petroleum resources, which may alter the behavior of dissolved organic compounds in groundwater following a fuel spill. This study evaluates the effects of oxygenate additives such as methanol or methyl tertiary-butyl ether 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: $67.00

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: $71.00

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: $134.00

Publ 4627
In-Situ and On-Site Biodegradation of Refined and Fuel Oils: A Review of Technical Literature 1988–1991

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: $67.00

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: $65.00

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: $105.00

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: $82.00

Publ 4674
Assessing the Significance of Subsurface Contaminant Vapor Migration to Enclosed Spaces—Site-Specific Alternative to Generic Estimates

Vapors in enclosed spaces pose two levels of concern. First, enclosed-space vapors may be found at concentrations near those that pose immediate flammability and/or health risks. These sites warrant immediate attention and response as required by most state and federal regulatory guidance. In the second class of sites, concentrations are lower and the concern is for longer term health risks. This report focuses exclusively on this second class of sites, where advection and diffusion occur through a soil layer and into an enclosed space, and time is available to adequately address the problem on a site-specific basis. The options considered in this document include the following:

- direct measurement through sampling of enclosed-space vapors,
- use of near-foundation or near-surface soil gas sampling results,
- use of site-specific homogeneous and layered soil diffusion coefficients in generic algorithms, and
- assessment of bioattenuation potential. Pages: 56

December 1998 | Product Number: I46740 | Price: $86.00

To purchase individual API standards, visit apiwebstore.org

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: $134.00

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: $76.00

Publ 4784
Quantification of Vapor Phase-Related Natural Source Zone Depletion Processes

Natural source zone depletion (NSZD) has emerged as an important concept within the realm of environmental remediation. NSZD is a term used to describe the collective, naturally occurring processes of dissolution, volatilization, and biodegradation that results in mass losses of light non-aqueous phase liquid (LNAPL) petroleum hydrocarbon constituents from the subsurface.

This document provides practical guidance on NSZD theory, application, measurement methods, and data interpretation. It is intended to be used by practitioners to help plan, design, and implement NSZD monitoring programs in support of petroleum hydrocarbon site remediation. Pages: 124

1st Edition | May 2017 | Product Number: I47840 | Price: $131.00

REMEDIAL TECHNOLOGIES

DR 225
Remediation of a Fractured Clay Till Using Air Flushing: Field Experiments at Sarnia, Ontario

This study was conducted over a three-year period at a well-characterized test site located in Canada near Sarnia, Ontario. A synthetic gasoline blend of known mass, volume, and composition was released into a test cell. Samples were collected and analyzed for gasoline range organics to establish the three-dimensional distribution of the release. Conventional air flushing technologies, soil vapor extraction and in-situ air sparging, were able to remove ~40 % of the spilled mass during the initial two months of operation. Following active remediation, primarily low-volatility compounds remained in the soil and almost no benzene or toluene remained. Based on mass balance data, a significant portion of the benzene, toluene, ethylbenzene, and xylene compounds was biodegraded. Pages: 220

October 1998 | Product Number: I00225 | Price: $105.00

Publ 4525
A Compilation of Field-Collected Cost and Treatment Effectiveness Data for the Removal of Dissolved Gasoline Components from Groundwater

Documents, summarizes, and evaluates cost and treatment effectiveness data for air stripping and carbon adsorption systems designed to remove dissolved petroleum hydrocarbons from groundwater. The compounds of primary interest were benzene, toluene, ethylbenzene, and xylene isomers (BTEX) as well as the oxygenates methyl tertiary-butyl ether and isopropyl ether. Operating data were gathered from 57 field sites throughout the United States, and treatment system profiles were generated for each site. The data will be used to assist companies in planning pump-and-treat remediation systems for removal of BTEX and oxygenates from groundwater. Pages: 240

November 1990 | Product Number: I45250 | Price: $86.00

Publ 4609
In-Situ Air Sparging: Evaluation of Petroleum Industry Sites and Considerations for Applicability, Design and Operation

Describes the important literature findings as well as the hands-on experiences of the petroleum industry at 59 air sparging sites. Design and operational data are analyzed for relationships that can be used to optimize the technology or provide a better understanding of its fundamental processes. Topics covered include: site characterization; pilot testing; system design and installation; and system operation, monitoring, and performance. Pages: 132

May 1995 | Product Number: I46090 | Price: $105.00

Publ 4631
Petroleum Contaminated Low Permeability Soil: Hydrocarbon Distribution Processes, Exposure Pathways and In-Situ Remediation Technologies

Presents a set of 10 papers on light nonaqueous phase liquids (LNAPLs) in low permeability soils. Collectively, the papers address four key areas: (1) processes affecting the migration and removal of LNAPLs; (2) exposure potential posed by clay soil and hydrocarbons via soil, groundwater, and air pathways; (3) models for predicting LNAPL removal; and (4) techniques of remediation. Pages: 298

September 1995 | Product Number: I46310 | Price: $95.00

■ 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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Publ 4655

Field Evaluation of Biological and Non-Biological Treatment Technologies to Remove MTBE/Oxygenates from Petroleum Product Terminal Wastewaters

A pilot/demonstration study was conducted on three treatment technologies—the fluidized bed biological reactor process, the activated sludge process incorporated with iron flocculation, and the ultraviolet light/hydrogen peroxide process—to evaluate their effectiveness in the treatment of petroleum marketing terminal wastewater contaminated with methyl tert-butyl ether (MTBE). Contaminated groundwater was the primary constituent of the wastewater, which also contained benzene, toluene, ethylbenzene, and xylenes (BTEX). All three technologies were able to remove at least 95 % of the MTBE and BTEX in the feed waters. Pages: 194

August 1997 | Product Number: I46550 | Price: $134.00

Publ 4671

Technical Bulletin on Oxygen Releasing Materials for In-Situ Groundwater Remediation

Oxygen releasing materials (ORMs) are commercially available materials that are being used to enhance bioremediation treatment of petroleum hydrocarbon contaminated groundwater aquifers. This technical bulletin provides a systematic approach for evaluating the utility of ORM treatment and for designing ORM installations. It summarizes the current state of understanding of this technology to provide guidance for site managers evaluating options for enhanced groundwater remediation. Pages: 52

July 1998 | Product Number: I46710 | Price: $144.00

Publ 4715

Evaluating Hydrocarbon Removal from Source Zones and its Effect on Dissolved Plume Longevity and Concentration

Provides valuable information and utilities for regulators and practitioners interested in understanding the possible benefits of free-product removal. This report provides theory and concepts needed to evaluate light nonaqueous phase liquid (LNAPL) source distribution, chemistry, dissolution, and the effects various remediation strategies may have on risk reduction for the groundwater and vapor exposure pathways. The companion software, API-LNAST, links the multiphase and chemical processes controlling in-situ LNAPL distribution, mobility, and cleanup to quantify estimates of the time-dependent concentrations within the LNAPL source and the down gradient dissolved plume. API-LNAST users can screen whether incremental LNAPL removal provides any risk-reduction benefit over a time frame of interest, e.g. 30 years.

September 2002 | Software and documentation can be downloaded at https://www.api.org/oil-and-natural-gas/environment/clean-water/ground-water/lnapl/evaluating-hydrocarbon-removal

Publ 4730

Groundwater Remediation Strategies Tool

Provides strategies for focusing remediation efforts on (1) the change in contaminant mass flux in different subsurface transport compartments (e.g. the vadose zone, smear zone, or a zone within an aquifer of interest) and (2) the change in remediation timeframe.

In this approach, groundwater flow and contaminant concentration data are combined to estimate the rate of contaminant mass transfer past user-selected transects across a contaminant plume. The method provides the user with a means to estimate the baseline mass flux and remediation timeframe for various transport compartments and then evaluate how different remedies reduce the mass flux and the remediation timeframe in each transport compartment. Pages: 71

December 2003 | Product Number: I473000 | Price: $138.00

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.

January 2007 | Software and documentation can be downloaded at https://www.api.org/oil-and-natural-gas/environment/clean-water/ground-water/lnapl/ldrm

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 https://www.api.org/~/media/4762%20LNAPL%20Tn%20wkbk%20Baildown%20userguide%20Apr2016%20(2).pdf

To purchase individual API standards, visit apiwebstore.org

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: $115.00

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: $95.00

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: $67.00

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: $76.00

Publ 4659
Graphical Approach for Determining Site-Specific Dilution-Attenuation Factors (DAFs): Technical Background Document and User's Guide

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: $128.00

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 xylenes (BTEX); MTBE; and Cl^- was monitored in detail for about 16 months. The mass of BTEX in the plume diminished significantly with time due to intrinsic biodegradation. MTBE, however, was not measurably attenuated. In 1995–1996, a comprehensive groundwater sampling program was undertaken to define the mass of MTBE still present in the aquifer. Only about 3 % of the initial MTBE mass was found, and it is hypothesized that biodegradation played an important role in its attenuation. Additional evidence is necessary to confirm this possibility. Pages: 88

June 1998 | Product Number: I46680 | Price: $67.00

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: $95.00

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 | https://www.api.org/oil-and-natural-gas/environment/clean-water/ground-water/oxygenates/site-characterization

■ This publication is a new entry in this catalog.

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

To purchase individual API standards, visit apiwebstore.org

Publ 4709
Risk-Based Methodologies for Evaluating Petroleum Hydrocarbon Impacts at Oil and Natural Gas E&P Sites

The process of calculating human health risk-based screening levels for total petroleum hydrocarbons (TPH) is described in an easy-to-understand question and answer format. [Risk-based screening levels (RBSLs) are chemical-specific concentrations in environmental media that are considered protective of human health.] Risk assessment concepts developed by the U.S. Environmental Protection Agency and research groups such as the Petroleum Environmental Research Forum and the Total Petroleum Hydrocarbon Criteria Working Group are used to calculate RBSLs for TPH in crude oil and 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) wastes (contrasted with refined products), a summary of the federal regulatory status of E&P wastes, and a listing of key equations used for calculating RBSLs. Pages: 100

February 2001 | Product Number: I47090 | Price: $90.00

Publ 4711
Methods for Determining Inputs to Environmental Petroleum Hydrocarbon Mobility and Recovery Models

This publication is an invaluable reference for operators, consultants and regulators responsible for cleanup of subsurface petroleum releases. Important fluid and soil property parameters are explained. Methods to measure each parameter are presented in order of relevance for use in environmental free-product mobility/recovery assessments. Fluid property parameters covered include density, viscosity, surface tension, and interfacial tension. Laboratory-scale soil property parameters include: capillary pressure vs. saturation, relative permeability vs. saturation, water and nonaqueous phase liquid saturation, and Brooks-Corey and van Genuchten model parameters. Field-scale bail-down and production tests are explained and cited. Sample collection and handling procedures are summarized. A listing and abstract of relevant ASTM methods are provided in the appendix. Pages: 72

July 2001 | Product Number: I47110 | Price: $121.00

Publ 4731
Light Non-Aqueous Phase Liquid (LNAPL) Parameters Database—Version 2.0—Users Guide

A collection of information about samples that have had their capillary parameters determined, as well as other physical parameters measured. Capillary properties are critical in multiphase calculations, and those results have very high sensitivity to these properties. The primary purpose of this database is to provide information to users who are trying to characterize the movement and distribution of LNAPL within a site that has a limited set of direct observations of the capillary properties of the site. Other databases of related parameters have typically been derived from measurements in the agricultural or the petroleum extraction industries; neither being necessarily representative of near-surface environmental conditions. This database give the user the opportunity to understand the range of capillary characteristics observed at sites that are geologically similar, but where there are more direct and laboratory observations available.

December 2003 | Product Number: I47310 | Price: $138.00
The database is available from API's website: https://www.api.org/oil-and-natural-gas/environment/clean-water/ground-water/lnapl/parameter-database

Publ 4739
API Interactive LNAPL Guide—Version 2.0.4

A comprehensive and easy-to-use electronic information system and screening utility. The guide is designed to provide an overall approach for evaluating light nonaqueous phase liquid (LNAPL) at a site, assessing its potential risk, quantitatively defining mobility and recoverability, developing remedial strategies, and examining methods to enhance site closure opportunities.

The guide includes the following:

- 11 primers covering all aspects of LNAPL from LNAPL basics to remediation;
- 14 assessment tools, including API-LNAST Version 2.0, "Charbeneau" spreadsheets for LNAPL recovery (August 2003), the API LNAPL Parameter Database;
- LNAPL decision-making frameworks;
- videos and animated figures; and
- an extensive reference list.

February 2006 | Available for download at http://www.api.org/oil-and-natural-gas/environment/clean-water/ground-water/lnapl/interactive-guide

Publ 4761
Technical Protocol for Evaluating the Natural Attenuation of MtBE

Addresses data collection, evaluation, and interpretation procedures that consider the physical, chemical, and biological properties of methyl tert-butyl ether (MtBE) and other oxygenates and degradation byproducts. A tiered approach is provided that can be used by stakeholders to interpret several lines of evidence to evaluate natural attenuation on a site-specific basis. Several resources are provided to support an MNA evaluation, including the following:

- a review of basic scientific principles relevant to the evaluation of MtBE natural attenuation, including biodegradation and physicochemical attenuation mechanisms;
- a discussion of data that can be used to assess MtBE (and other oxygenates or degradation byproducts) natural attenuation;
- technical references for relevant chemical properties, analytical methods, and field sampling techniques;
- guidance for data quality assurance and interpretation, including statistical analysis; and
- guidance on the presentation of natural attenuation data/information to facilitate regulatory and other stakeholder review and acceptance of MNA remedies. Pages: 186

May 2007 | Available from API's website: https://www.api.org/oil-and-natural-gas/environment/clean-water/ground-water/oxygenates

Environmental Stewardship Program Publications

RP 75
Safety and Environmental Management System for Offshore Operations and Assets

Provides companies engaged in offshore operations with a framework for the establishment, implementation, and maintenance of a Safety and Environmental Management System (SEMS) to manage and reduce risks associated with safety and the environment to prevent incidents and events.

This recommended practice applies, in part or whole, to companies engaged in offshore operations, from lease evaluation through decommissioning.

This document is not intended to be prescriptive or limiting on the expectations of each SEMS element; rather, it allows flexibility appropriate to the size, scope, and risk of a Company's assets and operations. It is advised that users of this document review and comply with applicable legal and regulatory requirements, and conform with applicable industry codes and standards.

Consideration may be given to using this document to help systematically manage other aspects of operations, such as security and health. Pages: 34

4th Edition | December 2019 | Product Number: G07504 | Price: $132.00

Publ 9100
Model Environmental, Health and Safety (EHS) Management System and Guidance Document

Comes with a binder complete with both Publ 9100A and Publ 9100B—see descriptions listed below. Pages: 65

October 1998 | Product Number: R9100S | Price: $171.00

Publ 9100A
Model Environmental, Health and Safety (EHS) Management System

Intended to be used as a voluntary tool to assist companies interested in developing an EHS management system or enhancing an existing system. The model, which applies a quality systems approach to managing EHS activities, focuses on people and procedures by pulling together company EHS policies, legal requirements, and business strategies into a set of company or facility expectations or requirements.

Please refer to the companion document Publ 9100B for additional information. Publ 9100A and Publ 9100B are intended to be companion documents and can be purchased as a set or individually. Pages: 20

October 1998 | Product Number: R9100A | Price: $89.00

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: $130.00

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: $69.00

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: $80.00

Publ 307
An Engineering Assessment of Acoustic Methods of Leak Detection in Aboveground Storage Tanks

Provides the results of a leak detection project in aboveground storage tanks that utilized acoustic methods to detect leaks. A series of field tests were conducted on a 114-ft diameter tank that contained a heavy naphtha petroleum product. The analytical and experimental results of this project suggest that passive-acoustic leak detection methods can be used to detect small leaks in aboveground storage tanks. Pages: 76

January 1992 | Product Number: J30700 | Price: $80.00

Publ 315
Assessment of Tankfield Dike Lining Materials and Methods

To assess tankfield materials and methods of containment, API commissioned a review of environmental regulations as well as a survey of candidate liner materials and installation methods to explore the technology base. The study was limited to diked areas surrounding storage tanks. Liner installations for secondary containment underneath tanks were excluded. Pages: 50

July 1993 | Product Number: J31500 | Price: $80.00

Publ 322
An Engineering Evaluation of Acoustic Methods of Leak Detection in Aboveground Storage Tanks

Describes a set of controlled experiments conducted on a 40-ft diameter refinery tank to determine the nature of acoustic leak signals and ambient noise under a range of test conditions. The features of a leak detection test needed for high performance are explored. The report concludes that accurate and reliable leak detection of aboveground storage tanks can be achieved through the use of acoustic methods. Pages: 80

January 1994 | Product Number: J32200 | Price: $80.00

Publ 323
An Engineering Evaluation of Volumetric Methods of Leak Detection in Aboveground Storage Tanks

Two volumetric approaches to detecting leaks from aboveground storage tanks—precision temperature sensors and mass measurement approaches—are evaluated in this report. A set of controlled experiments on a 117-ft diameter refinery tank is used to examine the effects of differential pressure on conventional level and temperature measurement systems. The features of a leak detection test needed for high performance are also explored. Pages: 86

January 1994 | Product Number: J32300 | Price: $80.00

To purchase individual API standards, visit apiwebstore.org

Publ 325
An Evaluation of a Methodology for the Detection of Leaks in Aboveground Storage Tanks

Describes the results of the fourth phase of a program to define and advance the state of the art of leak detection for aboveground storage tanks (ASTs). Three leak detection technologies are examined—passive-acoustic, soil-vapor monitoring, and volumetric—over a wide range of tank types, petroleum fuels, and operational conditions. This study also assesses the applicability of a general leak detection methodology involving multiple tests and product levels as well as determines the integrity of 14 ASTs using two or more test methods. Pages: 94

May 1994 | Product Number: J32500 | Price: $98.00

Publ 327
Aboveground Storage Tank Standards: A Tutorial

Presents procedures and examples to help designers, owners, and operators of aboveground storage tanks understand and comply with API's recommended practices, standards, and specifications concerning leak prevention. These API documents provide requirements designed to minimize environmental hazards associated with spills and leaks. The tutorial also shows how the API inspection and maintenance requirements influence the design of such tanks. It does not attempt to address additional rules and requirements imposed by individual jurisdictions or states. Pages: 70

September 1994 | Product Number: J32700 | Price: $80.00

Publ 328
Laboratory Evaluation of Candidate Liners for Secondary Containment of Petroleum Products

Provides comparative data on the physical properties of liner materials as a function of their controlled exposure to fuels and/or additives. Six membrane and two clay liners were tested. Project test results were used to rank the liners in terms of vapor permeation and relative changes in properties such as chemical resistance and liquid conductivity measured after immersion. Pages: 142

January 1995 | Product Number: J32800 | Price: $90.00

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: $153.00

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: $96.00

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: $80.00

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: $90.00

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: $158.00

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: $102.00

To purchase individual API standards, visit apiwebstore.org

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: $151.00

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: $105.00

Publ 4672
The Use of Treatment Wetlands for Petroleum Industry Effluents

Treatment wetlands are becoming widely used for cleansing some classes of wastewater effluents. Although the use of treatment wetlands is well established for wastewater categories such as municipal waste, stormwater, agricultural wastewater, and acid mine drainage water, their use in treating a variety of industrial wastewaters is less well developed. Constructed treatment wetlands hold considerable promise for managing some 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: $105.00

Publ 4676
Arsenic: Chemistry, Fate, Toxicity, and Wastewater Treatment Options

Arsenic is a naturally occurring element in rocks, soils, water, sediments, and biological tissues. It is also present in fossil fuels. Arsenic in the environment has both anthropogenic and natural sources, and certain anthropogenic sources have caused localized adverse effects on ecological systems and human health. Based on extensive review of the literature, this monograph is intended to serve as a reference volume on the sources of arsenic in the environment, the chemistry and fate of arsenic compounds, biomedical effects, the toxicity of arsenic to aquatic and terrestrial species, wastewater treatment options, and regulatory standards for arsenic in the environment. Pages: 196

October 1998 | Product Number: I46760 | Price: $105.00

Publ 4688
Temporary Treatment Options for Petroleum Distribution Terminal Wastewaters

Provides guidance to terminal operators and engineers in evaluating mobile treatment systems for wastewater generated at petroleum distribution terminals. Some of the variables that must be considered include the characteristics of the wastewater, the permitting process, and contractor experience. This document provides sufficient information to guide an operator/engineer through evaluation of mobile treatment systems, including problem definition, treatment technology selection, contractor selection, and implementation. Pages: 73

November 1999 | Product Number: I46880 | Price: $133.00

Publ 4694
Laboratory Analysis of Petroleum Industry Wastewaters

Assists in arranging for and understanding laboratory analysis of petroleum industry wastewaters. Designed for environmental coordinators, managers, corporate staff, and others who must address environmental compliance reporting and regulatory issues. It is also useful for field personnel responsible for obtaining wastewater sample analyses to fulfill environmental regulatory requirements. Guidance and information are provided for setting data quality objectives; planning analyses; selecting a laboratory; and reviewing laboratory reports, detection and quantification limits, quality assurance/quality control practices, method references, method-defined analytes, and statistical calculations. Examples of case studies, laboratory reports, and data calculations are given throughout the manual. Checklists are provided to help users understand, plan, and review laboratory data. Pages: 175

December 1999 | Product Number: I46940 | Price: $133.00

To purchase individual API standards, visit apiwebstore.org

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 assuring that the permit is fair and properly implements the applicable regulations. Much of the information in this manual is based on practical experience with many NPDES permits and applications. Examples and case histories are provided to help the user understand the permit application process. Pages: 220

December 1999 | Product Number: I46950 | Price: $140.00

Publ 4698
A Review of Technologies to Measure the Oil and Grease Content of Produced Water from Offshore Oil and Gas Production Operations

Identifies and evaluates practical alternative methods for routine monitoring of oil and grease in produced waters. Traditional monitoring methods relied on Freon-113r extraction of oil and grease; however, owing to the phase-out of Freon-113r these methods can no longer be used, and new methods must be sought. This study evaluates two infrared detection methods and one fluorescence detection method for identifying and measuring oil and grease in produced waters. Performance information and the correlation of analytical results with the U.S. Environmental Protection Agency's hexane extraction method, Method 1664, are provided. Pages: 138

November 1999 | Product Number: I46980 | Price: $133.00

Publ 4717
Predictors of Water-Soluble Organics (WSOs) in Produced Water—A Literature Review

Reviews the scientific literature on the identity and physical/chemical characteristics of the WSOs in produced water in relation to characteristics of fossil fuels and their reservoirs. Pages: 24

March 2002 | Product Number: I47170 | Price: $80.00

Publ 4721
Analytical Detection and Quantification Limits: Survey of State and Federal Approaches

The purpose of this review was to determine the analytical detection and quantification limit policies of various state agencies. Of particular interest were policies for setting wastewater discharge permit limits at or below detection or quantification limits, for determining compliance with such limits, and for using alternative approaches to determining detection or quantification limits. Although the main focus of this review was on state policies involving water quality issues, included in the review were the policies of programs in other environmental areas as well as in federal regulations and statutes. Pages: 129

June 2002 | Product Number: I47210 | Price: $151.00

Publ 4736
Identification of Key Assumptions and Models for the Development of Total Maximum Daily Loads

Provides the reader with an understanding of the use of models in the development and implementation of total maximum daily loading (TMDL) studies.

The report focuses on the types of models used for TMDLs, the key assumptions underlying the models, how models are selected for specific surface waters and impairments, the data required to apply the models to a specific surface water and impairment, and how the predictive capability of the models is assessed. Pages: 64

November 2006 | Product Number: I47360 | Price: $151.00

Publ 4750
Cyanide Discharges in the Petroleum Industry: Sources and Analysis

Because both industrial and municipal dischargers have been issued National Pollutant Discharge Elimination System permits with low (5–20 µg/L) effluent limits for cyanide, there has been considerable interest in the reliability of the available test methods at these low concentrations. This report provides guidance on the measurement, as well as the presence and environmental fate, of cyanide compounds and related chemical species in petroleum industry wastewater effluents. Pages: 42

November 2008 | Product Number: I47500 | Price: $102.00

Publ 4751
Evaluation of Water Quality Translators for Mercury

Discusses the technical issues and constraints associated with translation of a mercury fish tissue concentration into a water quality criterion, in the use and implementation of the U.S. Environmental Protection Agency's fish-tissue-based criterion for methylmercury. The report focuses on available analytical methods for evaluating mercury in fish and water; proposed methods for translating a fish tissue concentration for mercury into a concentration in water; and implementation of the mercury criterion in the development of total maximum daily loads and water quality-based effluent limits. Pages: 37

1st Edition | December 2005 | Product Number: I47510 | Price: $76.00

Publ 4756
Interim Permitting Manual—Navigating NPDES Permit Issues on Impaired Waters

Addresses many water quality standards issues that facilities may encounter, including existing uses, use attainability analyses to revise designated uses, fish consumption advisories, whole effluent toxicity criteria, and sediment criteria. The manual will provide guidance on a number of listing issues, including listings due to violations of narrative criteria and fish consumption advisories, delisting, listing waters that are impaired but do not need a total maximum daily loading (TMDL) because they are expected to meet standards through other means, and challenging an erroneous listing determination.

The second part of this manual will discuss permitting discharges to impaired waters during the interim period before TMDLs are developed. The manual will describe the development of water quality-based effluent limitations on impaired waters and will also discuss a number of issues for affected facilities to consider during the permitting process, including timing (when the permit should be issued), watershed permitting, verifying the impairment determination before the permit is issued, other controls available to bring the water into attainment, reasonable potential calculations, voluntary reduction measures, nonnumeric effluent limitations, and calculating numeric effluent limitations. Pages: 41

November 2006 | Product Number: I47560 | Price: $82.00

To purchase individual API standards, visit apiwebstore.org

Publ 4782
Petroleum Refining Industry Contribution to Nationwide Surface Water Nutrient Loadings

This analysis was commissioned by API to provide member companies and the public with a better understanding of the water quality problems associated with nutrient discharges to the nation's surface waters, the 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: $88.00

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: $93.00

BIOMONITORING

TR 402
Toxicity to Freshwater Alga, Selenastrum apricornutum

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: $67.00

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: $67.00

TR 407
TAME—Acute Toxicity to Mysid Shrimp (Mysidopsis bahia) Under Static Renewal Conditions

Describes the measurement of acute toxicity of tertiary amyl methyl ether (TAME) to mysid shrimp under static renewal conditions. Nominal concentrations of TAME—1.6, 4.0, 7.3, 15, 30, and 60 mg A.I./L—were maintained by renewing solutions at 24, 48, and 72 hours of exposure. Observations were recorded at test initiation and every 24 hours until the test was terminated. Pages: 84

February 1995 | Product Number: I00407 | Price: $67.00

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: $68.00

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: $76.00

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: $95.00

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: $105.00

Publ 4701
Bioaccumulation: An Evaluation of Federal and State Regulatory Initiatives

August 2000 | Product Number: I47010 | Price: $96.00

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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: $79.00

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: $79.00

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: $65.00

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: $96.00

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: $133.00

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: $141.00

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: 84

April 1998 | Product Number: I46650 | Price: $86.00

Publ 4673
Impacts of Petroleum Product Marketing Terminals on the Aquatic Environment

Examines the potential impact of petroleum product marketing terminal (PPMT) wastewater discharges to aquatic environments to ascertain if there is a need for more stringent regulations. Wastewater discharges by PPMTs were evaluated, the constituents normally present in these waste streams were identified, and their possible aquatic impacts were investigated. It was determined that PPMT wastewater discharges pose little environmental risk; therefore, stricter regulations for PPMT dischargers are unwarranted. Pages: 52

April 1999 | Product Number: I46730 | Price: $105.00

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 biomonitors, examples of use, and sources of addition information. However, covering all potential environmental applications (e.g. vapor phase sampling) and relevant research results is beyond the scope of this work. Finally, use of this guide does not obviate the need for proper review and oversight procedures prior to the initiation of a project with SPMDs. Pages: 172

March 2002 | Product Number: I46900| Price: $143.00

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: $112.00

To purchase individual API standards, visit apiwebstore.org

EFFLUENTS: REFINING

DR 148
Identification of Organic Toxicants in Treated Refinery Effluents

Effluents from five oil refineries were examined for the presence of chronic toxicity caused by nonpolar, organic compounds. U.S. Environmental Protection Agency (EPA) guidelines for Phase I toxicity characterization procedures were used. The refinery effluent containing the most nonpolar toxicity was selected for more detailed analyses and identification of the nonpolar toxicants using Phase II procedures. Extraction and elution conditions were modified to increase chronic toxicity recovery and also reduce the complexity of the nonpolar organic effluent fraction containing toxicity. Results showed that simple modifications of EPA guidance for C_{18} solid phase extraction procedures, combined with proper toxicity testing conditions, successfully tracked and isolated toxicity in an effluent fraction. Findings also indicated that sources of refinery effluent toxicants were a phenol associated with a jet fuel additive, and two brominated organics believed to be reaction products of cooling tower water treatment chemicals, rather than from crude oil constituents. Pages: 64

December 1997 | Product Number: I00148 | Price: $67.00

Publ 352
Management of Residual Materials: 1997 Petroleum Refining Performance

This report is the ninth in a series of reports presenting the results of the API Annual Refining Residual Survey. Included in the report are detailed assessments of generated quantities and management practices for 14 residual streams representing approximately 80 % of all residuals managed at U.S. refineries. Prior to the 1997 survey, the management techniques had included recycling to the cat cracker, which referred to routing a residual to a catalytic cracking unit. Further study revealed that the quantity for residuals actually recycled to a cracking unit was very small—perhaps nonexistent—and was therefore deleted from the 1997 survey. Data for prior years were adjusted. Industry trend toward increased recycling of residuals has continued. Pages: 108

September 1999 | Product Number: J35200 | Price: $133.00

OIL SPILLS

Evaluation and Comparison of Habitat and Resource Equivalency Analysis as Used to Conduct OPA NRDA

Focuses on the use of (Resource Equivalency Analysis) REA and Habitat Equivalency Analysis (HEA) when assessments are conducted under OPA. In this setting, the models are typically implemented with input from both the responsible party (RP) and the trustees. It has been suggested that, when used in this manner, REA and HEA need no strong technical underpinnings; if they are useful in reaching settlements, they have served a useful function. Provides a general understanding of REA and HEA, including their origins, relationship to economic methods, and application in real-world spill settings. Pages: 65

1st Edition | June 2022 | You may download a PDF of this document from https://www.oilspillprevention.org/oil-spill-research-and-development-cente

Swift Water Spill Response Guide

Contains a set of operational tools and references to assist in the response to spilled oils on inland swift waters, which are waters traveling at speeds greater than 2.5 mph. Pages: 41

1st Edition | April 2021 | Product Number: GD1605

You may download a PDF of this document from https://www.oilspill-prevention.org/oil-spill-research-and-development-cente

Winter Oil Spill Recovery Tactical Guidance Document ■

Contains a set of operational checklists, tools, and references to assist in inland winter spill response (WSR) for oil releases. Pages: 47

1st Edition | January 2024

You may download a PDF of this document from https://www.oilspill-prevention.org/oil-spill-research-and-development-cente

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: $279.00 | Template Only: Price: $103.00

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: $102.00

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, may have 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://www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/inland/options-for-minimizing-e20161228t134857.pdf

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

To purchase individual API standards, visit apiwebstore.org

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 http://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 http://www.oilspillprevention.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 mechanized treatment of spilled oil on sand beaches. Pages: 5

June 2016 | Product Number: I115140 | For a free copy of this document, please visit http://www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/shoreline-protection/mechanical-treatment-of-sand-beaches-his.pdf

TR 1152
Industry Recommended Subsea Dispersant Monitoring Plan

Describes a proposed method for monitoring the efficacy of subsea dispersant injection (SSDI) to inform operational oil spill response decision-making by the Unified Command (UC). It is intended to be used as a model that can be modified to meet the needs of a specific incident. This plan is intended to complement the Subsea Dispersant Operations Plan, and it is imperative that effective communications be maintained between the organizational units that implement both. Pages: 5

November 2020 | Product Number: I115201 | For a free copy of this document, please visit http://oilspillprevention.org/-/media/Oil-Spill-Prevention/spillprevention/r-and-d/dispersants/api-1152-e1-industry-recommended-subsea.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 http://www.oilspillprevention.org/~/media/oil-spill-prevention/spillprevention/r-and-d/shoreline-protection/tidal-inlet-protection-strategies-final.pdf

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 http://www.oilspillprevention.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 http://www.oilspillprevention.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 http://www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/inland/sunken-oil-ops-guide.pdf

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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

June 2016 | Product Number: I115520 | For a free copy of this document, please visit http://www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/shoreline-protection/shoreline-in-site-treatment-fact-sheet.pdf

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

June 2016 | Product Number: I115530 | For a free copy of this document, please visit http://www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/shoreline-protection/shoreline-in-site-treatment-job-aid.pdf

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

October 2016 | Product Number: I12530 | For a free copy of this document, please visit http://www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/in-situ-burning/training-guide-for-isb-personnel.pdf

TR 1254
In-Situ Burning Guidance for Safety Officers and Safety and Health Professionals

Supports the incident Safety Officer (SOFR) and other safety and health professionals involved or having responsibilities in the incident response during oil spills where the strategy of controlled in-situ burning (ISB) can be used. Typically, oil spill response operations, including those involving ISB, are conducted using the organization structure prescribed by the National Incident Management System Incident Command Systems (NIMS/ICS) (DHS, 2009). The SOFR is position appointed as part of the Command Staff. As stated in NIMS/ICS guidance, the SOFR's function "is to develop and recommend measures for ensuring personnel safety and to assess and/or anticipate hazardous and unsafe situations." (DHS, 2009). This would include operations relating to ISB if this response action is selected for use during an oil spill. Pages: 114

January 2018 | Product Number: I12541 |For a free copy of this document, please visit http://www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/in-situ-burning/in-situ-burning-guidance-for-safety-offi.pdf

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

October 2016 | Product Number: I12560 | For a free copy of this document, please visit http://www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/in-situ-burning/api-technical-report-1256-in-situ-burnin.pdf

Publ 4558
Options for Minimizing Environmental Impacts of Freshwater Spill Responses

Developed for contingency planners and field responders, this guide provides information on 29 response methods and classifies their relative environmental impact for combinations of 4 oil types and 12 freshwater environments and habitats. Spill topics of concern in freshwater settings are discussed, including public health, conditions under which oil might sink in freshwater, oil behavior in ice conditions, permafrost, and firefighting foam use. Pages: 146

February 1995 | Product Number: I45580 | Price: $95.00

■ 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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Bull 4565
Species and Habitat Conservation—Industry Fundamentals

Provides oil and natural gas operators with information on conservation measures to support planning and execution of onshore oil and natural gas projects in the United States for conventional and unconventional (shale) developments. The species and habitat conservation fundamentals presented are processes and practices used to manage potential risks of project-related impacts on wildlife and habitats. These processes and practices are aimed primarily at industry professionals responsible for managing the potential risks of project impacts on biodiversity, but may also be used by contractors, subcontractors, and vendors. Pages: 44

1st Edition | November 2022 | Product Number: G456501 | Price: $108.00

Publ 4640
Petroleum in the Freshwater Environment: An Annotated Bibliography, 1946–1993

The growing concern for petroleum contamination in freshwater ecosystems led API to generate an annotated bibliography to serve as a valuable resource of existing literature on petroleum and its impact on the freshwater environment. It cites literature from 1946 through 1993 on the impact of petroleum products and oil spill cleanup agents on the biota of freshwater ecosystems, on the chemistry and fate of petroleum and cleanup agents in freshwater, and on the review of cleanup methods in freshwater systems. The electronic companion infobase has been prepared in two versions to enhance the value of the annotations: (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: $66.00
(VIP editable) Product Number: I46401 | Price: $81.00

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: $62.00

Publ 4675
Fate and Environmental Effects of Oil Spills in Freshwater Environments

Provides basic information necessary for the formulation of spill response strategies that are tailored to the specific chemical, physical, and ecological constraints of a given spill situation. It summarizes environmental effects from inland oil spills into fresh surface waters. It provides technical information for persons responsible for inland spill response and cleanup, for researchers, and for others dealing with protection of the environment from possible oil spill hazards. This research identifies, describes, and compares the behavior, fate, and ecological implications of crude oil and petroleum products in inland waters. Pages: 160

December 1999 | Product Number: I46750 | Price: $154.00

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: $128.00

Publ 4689
Chemical Human Health Hazards Associated with Oil Spill Response

Contains an overview of human health hazards that could be encountered by personnel involved with spills or leaks of petroleum products. The discussion includes potential risks of basic components and products of concern. Environmental factors that may affect exposure and a brief summary of other exposure considerations are also included. Pages: 51

August 2001 | Product Number: I46890 | Price: $90.00

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." API, the National Oceanographic and Atmospheric Administration, the U.S. Coast Guard and the U.S. Environmental Protection Agency developed the Marine Manual for oil spill contingency planners and field responders. The information allows both planners and responders to identify techniques that minimize the ecological impact of both the response action and the spilled oil. 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: $82.00

Bull 4719
Requesting Regulatory Concurrence for Subsea Dispersant Use

Provides guidelines, forms, and checklists recommended for use by industry. The API guidelines describe the RRT concurrence request process, proposed information submission recommendations that are specific to subsea dispersant injection, and the use of Spill Impact Mitigation Analysis (SIMA) and other forms of tradeoff analyses as decision support tools. Also included are practical flowcharts and checklists specific to Incident Management Team (IMT) positions that are integral to subsea dispersant use, and guidance on the preparation of subsea dispersant operations and monitoring plans. This document provides operational guidelines intended for actual events or exercises and provides a basis for engagement from a range of relevant stakeholders. Pages: 44

June 2017 | Product Number: I47911 | Price: $108.00

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: $93.00

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: I47351 | Price: Free*

Publ 4740
In-Situ Burning—A Decision-Maker's Guide to In-Situ Burning

This scenario is fictitious, but the circumstances are possible. 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

April 2005 | Available for download at https://www.api.org/oil-and-natural-gas/environment/clean-water/oil-spill-prevention-and-response/~/media/4BDBD6AABD534BF1B88EB203C6D8B8F4.ashx

OIL SPILLS: MSRC REPORTS

Marine Spill Response Corporation (MSRC) Research & Development Technical Reports are available from the Linda Hall Library. To order, contact Document Services at 800-662-1545 or 816-363-4600; fax: 816-926-8785; website: https://www.lindahall.org.

TR 91-001
Priority Topics for Research and Development in Oil Spill Response

TR 92-001
An Analysis of Historical Oil Spills and Current Cleanup Requirements to Aid in Selecting New Technologies for Spill Cleanup Operations

TR 92-002
Airborne Surveillance Technology Options for Improving Oil Spill Cleanup and Response

TR 92-003
Tenyo Maru Oil Spill (Remote Sensing Data Analysis)

TR 92-004
Oil Spill Detection Using Satellite-Based SAR

TR 92-006
Incorporation of State of the Art Technologies to Oil Spill Modeling

TR 93-001
Evaluation of Marine Post-Spill Sites for Long-Term Recovery Studies

TR 93-002.1
ROPME Sea Oil Spill Nearshore Geochemical Processes Study (Vol. 1)

TR 93-002.2
ROPME Sea Oil Spill Nearshore Geochemical Processes Study (Vol. 2) (Hydrocarbon Chemistry Analytical Results for Year One)

TR 93-002.3
ROPME Sea Oil Spill Nearshore Geochemical Processes Study (Vol. 3) (Remote Sensing Derived Habitat Classification and Error Evaluation for Year One)

■ This publication is a new entry in this catalog.

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

TR 93-003.1
Interlaboratory Calibration Testing of Dispersant Effectiveness: Phase 1

TR 93-003.2
Interlaboratory Calibration Testing of Dispersant Effectiveness: Phase 2

TR 93-004
Oil Spill Detection: Documentation of Historical Remote Sensing Projects and Status

TR 93-006
MSRC Oil Spill Response Vessel Recovered Oil Systems Tests

TR 93-007
Occupational Health Implications of Crude Oil Exposure: Literature Review and Research Needs

TR 93-009.1
Aerial Dispersant Application: Assessment of Sampling Methods and Operational Altitudes, Vol. 1

TR 93-012
MSRC Workshop Report: Research on Worker Health & Safety

TR 93-013
MSRC Workshop Report: Research on Bioremediation of Marine Oil Spills

TR 93-014
MSRC Workshop Report: Research on the Ecological Effects of Dispersants and Dispersed Oil

TR 93-018
Formation and Breaking of Water-in-Oil Emulsions: Workshop Proceedings

TR 93-019
Mesocosm Test Facility Strawman Design

TR 93-023
Seminar on Software for Oil Spill Response and Contingency Planning

TR 93-024
Summary Report MSRC/IKU Flume Design Workshop

TR 93-026
Demulsification by Use of Heat and Emulsion Breaker

TR 93-027
Transfer of Crude Oil Weathering Technology

TR 93-028
Evaluation of a Toxicity Test Method Used for Dispersant Screening in California

TR 93-029
Technical Evaluation of the Coastal Oil Spill Simulation System Prototype

TR 93-030
Determination of Oil and Emulsions Viscosity and Interfacial Tension

TR 93-031
Recovered Oil and Oily Debris Handling to Facilitate Disposal

TR 93-032
Weathering Properties and Chemical Dispersibility of Crude Oils Transported in U.S. Waters

TR 94-001
In-Situ Burning of Water-in-Oil Emulsions

TR 94-003
Waterbird Deterrent Techniques

TR 94-004
A Review of the Methods and Ecological Consequences of Substrate Aeration for the Enhancement of Oil Bioremediation in Wetlands

TR 94-005
Coastal Oil Spill Simulation System Prototype Testing Program

TR 94-006
MSRC Workshop Report: Research on Waterbird Deterrents at Marine Oil Spills

TR 94-007
Phase 1: Oil Containment Boom at Sea Performance Test

TR 94-008
Rheological Correlation Studies on Water-in-Oil Emulsions

TR 94-010
Dispersed Oil and Dispersant Fate and Effects Research, California Program Results for 1993–94

TR 94-011
Toxicity Bioassays on Dispersed Oil in the North Sea: August 1994 Field Trials

TR 94-012
Demulsification by Use of Heat and Emulsion Breakers, Phase 2

TR 94-013
The Science, Technology and Effects of Controlled Burning of Oil Spills at Sea

TR 94-015
Comparison of Physically and Chemically Dispersed Crude Oil Toxicity Under Continuous and Spiked Exposure Scenarios

TR 94-018
Potential Use of the Microtox Assay as an Indicator of the Toxicity of Dispersed Oil

TR 94-019
Aerial Dispersant Application: Field Testing Research Program (Alpine, Texas)

TR 95-001
Phase 2: At Sea Towing Tests of Fire Resistant Oil Containment Booms

TR 95-002
Isolation and Identification of Compounds and Mixtures Which Promote and Stabilize Water-in-Oil Emulsions

TR 95-003
Phase 3: Oil Containment Boom at Sea Performance Tests

TR 95-004
Utility of Current Shoreline Cleaning Agent Tests in Field Testing

To purchase individual API standards, visit apiwebstore.org

TR 95-005
An Analysis of Historical Opportunities for Dispersant and In-Situ Burning Use in the Coastal Waters of the United States Except Alaska

TR 95-007
Field Evaluation of Bioremediation in Fine Sediments

TR 95-010
Laboratory Studies of the Properties of In-Situ Burn Residues

TR 95-011
Formulation of New Fireproof Boom Designs

TR 95-012
Dispersed Oil and Dispersant Fate and Effects Research: California Program Results for 1994–1995

TR 95-014
The Effects of Oil and Chemically Dispersed Oil in Tropical Ecosystems: 10 Years of Monitoring Experimental Sites

TR 95-015
Reduction in the Toxicity of Crude Oil During Weathering on the Shore

TR 95-017
Mesoscale In-Situ Burn Aeration Test

TR 95-018
Proceedings of the Third Meeting of the Chemical Response to Oil Spills: Ecological Effects Research Forum

TR 95-019
A Mental Models Approach to Preparing Summary Reports on Ecological Issues Related to Dispersant Use

TR 95-020.1
Development of Protocols for Testing Cleaning Effectiveness and Toxicity of Shoreline Cleaning Agents (SCAs) in the Field

TR 95-020.2
Test Cleaning Effectiveness and Toxicity of Shoreline Cleaning Agents (SCAs): Data Report

TR 95-021
New Brunswick Bird Deterrent Study

TR 95-022
Proceedings of the Workshop on Technical Issues Related to Mesocsm Research in the Coastal Oil Spill Simulation System Facility

TR 95-024
Oil Weathering Study of the Morris J. Berman No. 6 Cargo Oil

TR 95-025
Oil Weathering Study of Arabian Light Crude Oil

TR 95-026
Oil Weathering Study of Maya Crude Oil

TR 95-027
Weathering Characterization of Heavy Fuels

TR 95-029
Dispersant Effectiveness: Phase 3

TR 95-030
Standard Method for Viscosity Measurement of Water-in-Oil Emulsions

TR 95-031
Toxicity Assessment of Oiled and Treated Sediments from and Experimental Bioremediation Site in Delaware Bay, USA

TR 95-033
Large Scale Testing of the Effect of Demulsifier Addition to Improve Oil Recovery Efficiency

TR 95-034
Evaluation of Oil Spill Cleanup Techniques in Coastal Environments

TR 95-038
Key Factors that Control the Efficiency of Oil Spill Mechanical Recovery Methods

BIENNIAL OIL SPILL CONFERENCE PROCEEDINGS

These conferences are sponsored by 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 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: $71.00

Publ 4675
Fate and Environmental Effects of Oil Spills in Freshwater Environments

Provides basic information necessary for the formulation of spill response strategies that are tailored to the specific chemical, physical, and ecological constraints of a given spill situation. It summarizes environmental effects from inland oil spills into fresh surface waters. It provides technical information for persons responsible for inland spill response and cleanup, for researchers, and for others dealing with protection of the environment from possible oil spill hazards. This research identifies, describes, and compares the behavior, fate, and ecological implications of crude oil and petroleum products in inland waters. Pages: 160

December 1999 | Product Number: I46750 | Price: $154.00

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: $128.00

■ This publication is a new entry in this catalog.

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

To purchase individual API standards, visit apiwebstore.org

Publ 4686
1999 Oil Spill Conference Proceedings
1999 | CD-ROM Product Number: I4686A | Price: $63.00
Hard Copy Product Number: I4686B | Price: $63.00

Publ 4710
2003 Oil Spill Conference Proceedings
CD-ROM Product Number: I4701A | Price: $333.00
Hard Copy Product Number: I4701B | Price: $333.00

Publ 4718
2005 Oil Spill Conference Proceedings
CD-ROM Product Number: I47180A | Price: $333.00

SEDIMENTS

Publ 4607
User's Guide and Technical Resource Document: Evaluation of Sediment Toxicity Tests for Biomonitoring Programs

Serves as a comprehensive guide for the selection of sediment toxicity tests. It compares the types of tests available, specific test methods, and selection of species for their strengths and weaknesses for a particular kind of habitat. Descriptions are provided on test types, test species, and sediment preparations. This publication additionally includes a user's guide for readers unfamiliar with sediment toxicity testing. See also Publ 4608. Pages: 236

November 1994 | Product Number: I46070 | Price: $118.00

Publ 4608
User's Guide: Evaluation of Sediment Toxicity Tests for Biomonitoring Programs

Provides an introduction to sediment toxicity testing and presents to those unfamiliar with such testing how the resource manual (Publ 4607) can be used. The document contains descriptions of habitat type, sediment test systems, and biological endpoints. Site-specific concerns are identified to aid in test selection. Brief summaries of sampling and data analysis issues are also presented. Pages: 34

November 1994 | Product Number: I46080 | Price: $65.00

Publ 4632
Reducing Uncertainty in Laboratory Sediment Toxicity Tests

Evaluates some of the critical components of laboratory experiments that need to be considered to obtain accurate sediment toxicity assessments. The report describes the formulation and evaluation of a reference sediment, it examines the tolerances of common testing species to sediment characteristics, evaluates copper sulfate as a reference toxicant by determining the relative sensitivities of freshwater testing organisms, and evaluates potential sublethal endpoints for sediment potency. Pages: 152

September 1995 | Product Number: I46320 | Price: $67.00

Waste Research

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

March 2001 | Product Number: G00004 | For a free copy of this document, please visit https://www.api.org/~/media/Files/EHS/Environmental_Performance/E_P_Waste_Guidelines.pdf

Overview of Exploration and Production Waste Volumes and Waste Management Practices in the United States

Presents the results of a survey of the industry covering 1995 that describes current volumes of wastes generated from the production of oil and gas, describes how those wastes are managed, and identifies changes in waste management practices over the past decade. The report includes numerous tables presenting the results from the survey.

May 2000

DR 53
Characterization of Exploration and Production Associated Wastes

Approximately 0.1 % of the total volume of exploration and production wastes generated annually by the oil and gas industry is classified as associated waste. This report presents the analytical characterization of 120 samples representing 12 different associated waste categories. Fate and transport modeling of the characterization data are also included. The modeling suggests that associated wastes do not pose a threat to groundwater when managed in accordance with API guidance on landspreading, roadspreading, and burial. Pages: 160

November 1996 | Product Number: I00053 | Price: $147.00

Publ 351
Overview of Soil Permeability Test Methods

The determination of soil permeability is one of the most important items in assessing aboveground storage tank facilities' secondary containment areas. This publication outlines various methods to test the permeability of soil and distinguishes between laboratory and field methods, though it does not supply an exhaustive list of all available permeability methods. These methods are identified according to their applicability to particular soil types. The methods presented in this report are applicable to fine-grained soils (silts and clays) and coarse-grained soils (sands and gravels), but may not be appropriate to organic soils, such as peat, or to materials such as construction and demolition debris. All methods should be fully investigated for appropriateness and to determine its suitability to a particular situation. Pages: 60

April 1999 | Product Number: J35100 | Price: $98.00

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: $76.00

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: $67.00

To purchase individual API standards, visit apiwebstore.org

Publ 4600
Metals Criteria for Land Management of Exploration and Production Wastes: Technical Support Document of API Recommended Guidance Values

Provides scientifically defensible guidelines for land management of 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: $65.00

Publ 4618
Characteristics and Performance of Supercritical Fluid Extraction (SFE) in the Analysis of Petroleum Hydrocarbons in Soils and Sludges

Summarizes the results of a study to evaluate and improve SFE methods and instrumentation for analytical-scale extractions of petroleum hydrocarbons from soils and sludges. The study determines which types of samples and waste are best suited for analysis by SFE and optimal conditions for complete extraction. Pages: 24

May 1995 | Product Number: I46180 | Price: $65.00

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: $119.00

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: $100.00

Publ 4734
Modeling Study of Produced Water Release Scenarios

Provides a scientific basis for operators, regulators, and landowners to determine if assessment or remediation of produced water releases will provide a meaningful environmental benefit.

The two principal research objectives of this study are (1) the identification of produced water release scenarios that have a potential to cause groundwater quality impairment in homogeneous subsurface geologic profiles and (2) the prediction of chloride movement through the vadose zone for different release scenarios. Secondary objectives of the study included evaluation of the effect of heterogeneity on the migration of chloride through the vadose zone, the impact of repeat releases, and the effect on groundwater quality of surface soil restoration by revegetation and soil leaching.

The sensitivity analysis performed in this study provides an overview of the likelihood of groundwater impairment for large release volumes (100 bbls and 10,000 bbls). Assuming homogeneous unsaturated zone soil profiles, the results of over 1000 modeled release scenarios reveal that 49 % of single-event releases do not cause impairment of groundwater above drinking water standards for chloride (250 mg/L) in a monitoring well that is adjacent to the edge of the release. In 70 % of these scenarios, chloride concentrations in groundwater do not exceed 1000 mg/L. Although these numbers give no information about the fate of chloride from a specific produced water release, they do indicate that a release does not necessarily cause groundwater impairment. Pages: 124

January 2005 | Product Number: I47340 | Price: $134.00

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: $76.00

■ This publication is a new entry in this catalog.

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

Data Products

API DATA

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https://www.api.org/products-and-services/statistics
For technical inquiries, contact apidata@api.org

Weekly Statistical Bulletin (WSB)

Where Traders Around the World Get Their Data

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 https://www.api.org/products-and-services/statistics/api-weekly-statistical-bulletin#tab-contact

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. API's Monthly Statistical Report is published 2 to 3 weeks following the end of the month.

To obtain a copy of this report, please visit https://www.api.org/products-and-services/statistics/api-monthly-statistical-report

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 November). Historical data are also available in electronic format.

As of 2020, API no longer publishes this report. Historical editions are available for years 2019 and prior.

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).

As of 2020, API no longer publishes this report. Historical editions are available for years 2019 and prior.

Quarterly Well Completion Report (QWCR)

The QWCR provides detailed information on reported drilling activity and estimates the total number of wells and footage drilled. The estimates of quarterly completions and footage are displayed by well type, well class, and quarter for the 10 years prior. More detailed estimates of quarterly completions and footage are disaggregated by well type, depth interval, and quarter for the current year and 2 years prior. In addition, wells reported to API (not estimates) are listed on a state and regional level, disaggregated by well class, well type, and quarter, for the current year and 2 years prior.

The report is available within 2 weeks following the end of a quarter.

Single Subscriber
Product Number: T00006 | Price: $3,193.00

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.

As of 2017, API no longer publishes this report. Historical editions are available for years 2016 and prior.

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, and footage. An Analysis & Trends section provides detailed information and graphs about offshore and onshore wells, shale wells, coalbed methane wells, and sidetrack wells. The data presented in the U.S. Summary Tables section are broken down by well type (oil wells, gas wells, and dry holes) and by depth interval. Additionally, the data in these tables are disaggregated by well class (exploratory wells and development wells) and well location (and offshore and onshore).

Single Subscriber
(2019 Data) Product Number: T00007 | Price: Call for quote

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.

Single Subscriber
Electronic Product Number: T00008 | Price: $5,047.00
Hard Copy (2 Issues Only) Product Number: 05400 | Price: $1,751.00

For more information on all API documents relating to policy and economic studies, call (202) 682-8166.

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

Phone Inquiries: (202) 682-8166

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

To order, please visit https://www.springer.com/us/book/9780792396857

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CHINESE *

Spec Q1
Quality Management System Requirements for Organizations Providing Products for the Petroleum and Natural Gas Industry—Chinese
(includes Errata 1 dated October 2023, Errata 2 dated October 2024, Errata 3 dated November 2024, and Addendum 1 dated October 2024)
Chinese translation of Spec Q1.
10th Edition | September 2023
Product Number: G0Q110CH | Price: $160.00

Spec 2B
Specification for the Fabrication of Structural Steel Pipe—Chinese
Chinese translation of Spec 2B.
6th Edition | July 2001 | Reaffirmed: September 2020
Product Number: G02B06C | Price: $103.00

Spec 2F
Specification for Mooring Chain—Chinese
Chinese translation of Spec 2F.
6th Edition | June 1997 | Reaffirmed: September 2020
Product Number: G02F06C | Price: $112.00

RP 5A5/ISO 15463:2003
Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe—Chinese
(includes Errata 1 dated December 2009)
Chinese translation of RP 5A5/ISO 15463:2003.
7th Edition | June 2005 | Reaffirmed: January 2021
Product Number: GX5A507C | Price: $196.00

RP 5C1
Recommended Practice for Care and Use of Casing and Tubing—Chinese
Chinese translation of RP 5C1.
18th Edition | May 1999 | Reaffirmed: July 2020
Product Number: G05C18C | Price: $143.00

Spec 5CT ■
Casing and Tubing—Chinese
(includes Errata 1 dated May 2024 and Errata 2 dated August 2024)
Chinese translation of Spec 5CT.
11th Edition | December 2023
Product Number: G5CT11CH | Price: $345.00

Spec 5L
Line Pipe—Chinese
Chinese translation of Spec 5L.
46th Edition | April 2018 | Product Number: G05L46C | Price: $353.00

Spec 5LCP
Specification on Coiled Line Pipe—Chinese
(includes Errata 1 dated July 2007)
Chinese translation of Spec 5LCP.
2nd Edition | October 2006 | Reaffirmed: July 2020
Product Number: G5LCP2C | Price: $181.00

RP 5LT
Recommended Practice for Truck Transportation of Line Pipe—Chinese
Chinese translation of RP 5LT.
1st Edition | March 2012 | Reaffirmed: April 2024
Product Number: G5LT01C | Price: $75.00

Spec 5ST
Specification for Coiled Tubing—U.S. Customary and SI Units—Chinese
(includes Addendum 1 dated February 2024)
Chinese translation of Spec 5ST.
1st Edition | April 2010 | Reaffirmed: July 2020
Product Number: G5ST01C | Price: $166.00

Spec 6A
Specification for Wellhead and Tree Equipment—Chinese
(includes Errata 1 dated April 2019, Errata 2 dated June 2020, Addendum 1 dated July 2020, Errata 3 dated September 2020, Addendum 2 dated June 2021, Errata 4 dated September 2021, Addendum 3 dated August 2022, Addendum 4 dated November 2024, Errata 5 dated May 2024, and Errata 6 dated October 2024)
Chinese translation of Spec 6A.
21st Edition | November 2018
Product Number: GX06A21C | Price: $355.00

Spec 7F
Oil Field Chain and Sprockets—Chinese
(includes Errata 1 dated May 2013)
Chinese translation of Spec 7F.
8th Edition | November 2010 | Reaffirmed: July 2022
Product Number: G7F008C | Price: $144.00

Spec 7NRV
Specification for Drill String Non-Return Valves—Chinese
(includes Addendum 1 dated December 2019)
Chinese translation of Spec 7NRV.
1st Edition | July 2006 | Reaffirmed: July 2020
Product Number: G7NRV01C | Price: $87.00

Spec 8C
Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)—Chinese
(includes Errata 1 dated May 2014 and Errata 2 dated November 2020)
Chinese translation of Spec 8C.
5th Edition | April 2012 | Reaffirmed: August 2019
Product Number: GX08C05C | Price: $175.00

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Translated Publications

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

Chinese translation of RP 11BR.

9th Edition | August 2008 | Reaffirmed: July 2020
Product Number: G11BR09C | Price: $130.00

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

Chinese translation of TR 11L6.

2nd Edition | May 2008 | Product Number: G11L602C | Price: $108.00

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

Chinese translation of RP 14E.

5th Edition | October 1991 | Reaffirmed: September 2019
Product Number: 811-07185 CN940 | Price: $184.00

Spec 15LR
Specification for Low Pressure Fiberglass Line Pipe—Chinese
(includes Errata 1 dated June 2018 and Errata 2 dated April 2021)

Chinese translation of Spec 15LR.

7th Edition | August 2001 | Reaffirmed: October 2018
Product Number: G15LR7C | Price: $120.00

Spec 20B ■
Open Die Shaped Forgings for Use in the Petroleum and Natural Gas Industry—Chinese

Chinese translation of Spec 20B.

2nd Edition | November 2020
Product Number: G20B02C | Price: $117.00

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

Chinese translation of Spec 20C

3rd Edition | April 2020 | Product Number: G20C03C | Price: $117.00

Std 20D ■
Qualification of Nondestructive Examination Services for Equipment Used in the Petroleum and Natural Gas Industry—Chinese

Chinese translation of Std 20D.

2nd Edition | August 2019 | Product Number: G20D02C | Price: $122.00

Spec 20F ■
Corrosion-Resistant Bolting for Use in the Petroleum and Natural Gas Industries—Chinese
(includes Errata 1 dated November 2020 and Addendum 1 dated November 2021)

Chinese translation of Spec 20F.

2nd Edition | April 2018 | Product Number: G20F02C | Price: $108.00

Std 20G ■
Welding Services for Equipment Used in the Petroleum and Natural Gas Industry—Chinese

Chinese translation of Std 20G.

1st Edition | January 2020 | Product Number: G20G01C | Price: $104.00

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

Chinese translation of Std 20H.

2nd Edition | April 2020 | Product Number: G20H02C | Price: $94.00

Std 20L ■
Qualification of Polymeric Seal Manufacturers for Use in the Petroleum and Natural Gas Industries—Chinese

Chinese translation of Std 20L.

1st Edition | April 2018 | Product Number: G20L01C | Price: $81.00

Std 20M ■
Qualification of Suppliers of Machining Services for Use in the Petroleum and Natural Gas Industries—Chinese

Chinese translation of Std 20M.

1st Edition | October 2017 | Product Number: G20M01C | Price: $89.00

Std 20N ■
Heat Treatment Services—Continuous Line for Equipment Used in the Petroleum and Natural Gas Industry—Chinese

Chinese translation of Std 20N.

1st Edition | August 2019 | Product Number: G20N01C | Price: $99.00

RP 571 ■
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Chinese

Chinese translation of RP 571.

3rd Edition | March 2020 | Product Number: C57103C | Price: $450.00

Std 620
Design and Construction of Large, Welded, Low-Pressure Storage Tanks—Chinese
(includes Addendum 1 dated November 2014, Addendum 2 dated April 2018, and Addendum 3 dated September 2021)

Chinese translation of Std 620.

12th Edition | October 2013 | Product Number: C62012C | Price: $540.00

Std 653
Tank Inspection, Repair, Alteration, and Reconstruction—Chinese
(includes Addendum 1 dated April 2018, Addendum 2 dated May 2020, Addendum 3 dated November 2023, and Errata 1 dated March 2020)

Chinese translation of Std 653.

5th Edition | November 2014 | Product Number: C65305C | Price: $293.00

Std 682
Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps—Chinese

Chinese translation of Std 682.

4th Edition | May 2014 | Reaffirmed: May 2022
Product Number: C68204C | Price: $317.00

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Std 1104 ■
Welding of Pipelines and Related Facilities—Chinese
(includes Errata 1 dated September 2023)

Chinese translation of Std 1104.

22nd Edition | July 2021 | Product Number: D110422C | Price: $470.00

RP 1169
Pipeline Construction Inspection—Chinese

Chinese translation of RP 1169.

2nd Edition | March 2020 | Product Number: D11692 | Price: $225.00

API 1509
Engine Oil Licensing and Certification System—Chinese

Chinese translation of API 1509.

21st Edition | February 2022 | For a free copy of this document, please visit https://www.api.org/products-and-services/engine-oil/documents/api-1509-documents

JAPANESE *

API 510 ■
Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration—Japanese
(includes Errata 1 dated March 2023)

Japanese translation of API 510.
11th Edition | October 2022 | Product Number: C51011J | Price: $307.00

RP 571 ■
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Japanese

Japanese translation of RP 571.
3rd Edition | March 2020 | Product Number: C57103J | Price: $450.00

RP 583 ■
Corrosion Under Insulation and Fireproofing—Japanese

Japanese translation of RP 583.

2nd Edition | March 2021 | Product Number: C58302J | Price: $231.00

KAZAKH *

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

Kazakh translation of RP 5B1.

5th Edition | August 1999 | Reaffirmed: February 2024
Product Number: G05B15K | Price: $177.00

RP 5L8
Recommended Practice for Field Inspection of New Line Pipe—Kazakh

Kazakh translation of RP 5L8.

2nd Edition | December 1996 | Reaffirmed: May 2015
Product Number: G05L82K | Price: $155.00

TR 10TR1
Cement Sheath Evaluation—Kazakh

Kazakh translation of TR 10TR1.

2nd Edition | September 2008
Product Number: G10TR12K | Price: $180.00

TR 10TR4
Selection of Centralizers for Primary Cementing Operations—Kazakh

Kazakh translation of TR 10TR4.

1st Edition | May 2008 | Product Number: G10TR40K | Price: $77.00

TR 10TR5
Methods for Testing of Solid and Rigid Centralizers—Kazakh

Kazakh translation of TR 10TR5.

1st Edition | May 2008 | Product Number: G10TR50K | Price: $77.00

RP 59
Recommended Practice for Well Control Operations—Kazakh

Kazakh translation of RP 59.

2nd Edition | May 2006 | Reaffirmed: December 2018
Product Number: G59002K | Price: $152.00

PORTUGUESE *

Std 653
Tank Inspection, Repair, Alteration, and Reconstruction—Portuguese
(includes Addendum 1 dated April 2018, Addendum 2 dated May 2020, Addendum 3 dated November 2023, and Errata 1 dated March 2020)

Portuguese translation of Std 653.

5th Edition | November 2014
Product Number: C65305P | Price: $293.00

RP 1168
Pipeline Control Room Management—Portuguese

Portuguese translation of RP 1168.

2nd Edition | February 2015 | Reaffirmed: October 2021
Product Number: D11682P | Price: $113.00

API 1509
Engine Oil Licensing and Certification System—Portuguese

Portuguese translation of API 1509.

21st Edition | February 2022 | For a free copy of this document, please visit https://www.api.org/products-and-services/engine-oil/documents/api-1509-documents

RUSSIAN *

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

Russian translation of Q2.

2nd Edition | July 2021 | Product Number: G0Q202R | Price: $110.00

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RP 2A-WSD
Planning, Designing, and Constructing Fixed Offshore Platforms—Working Stress Design—Russian

Russian translation of RP 2A-WSD.

22nd Edition | November 2014 | Reaffirmed: September 2020
Product Number: G2AWSD22R | Price: $491.00

Spec 2B
Specification for the Fabrication of Structural Steel Pipe—Russian

Russian translation of Spec 2B.

6th Edition | July 2001 | Reaffirmed: September 2020
Product Number: G02B06R | Price: $103.00

Spec 2W
Steel Plates Produced by Thermo-Mechanically Controlled Processing for Offshore Structures—Russian

Russian translation of Spec 2W.

6th Edition | January 2019 | Product Number: G02W06R | Price: $127.00

RP 2Z
Recommendation Practice for Preproduction Qualification for Steel Plates for Offshore Structures—Russian

Russian translation of RP 2Z.

4th Edition | September 2005 | Reaffirmed: June 2015
Product Number: G02Z04R | Price: $149.00

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

Russian translation of Chapter 4.2.

3rd Edition | September 2003 | Reaffirmed: December 2022
Product Number: H04023R | Price: $153.00

RP 5A5/ISO 15463:2003
Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe—Russian
(includes Errata 1 dated December 2009)

Russian translation of RP 5A5/ISO 15463:2003.

7th Edition | June 2005 | Reaffirmed: January 2021
Product Number: GX5A507R | Price: $196.00

Spec 5B
Threading, Gauging, and Inspection of Casing, Tubing, and Line Pipe Threads—Russian
(includes Errata 1 dated June 2018, Errata 2 dated December 2018, Addendum 1 dated December 2018, and Addendum 2 dated December 2019)

Russian translation of Spec 5B.

16th Edition | December 2017 | Product Number: G5B016R | Price: $187.00

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

Russian translation of RP 5B1.

5th Edition | October 1999 | Reaffirmed: February 2024
Product Number: G05B15R | Price: $177.00

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

Russian translation of RP 5C1.

18th Edition | May 1999 | Reaffirmed: July 2020
Product Number: G05C18R | Price: $143.00

RP 5C5
Procedures for Testing Casing and Tubing Connections—Russian
(includes Addendum 1 dated May 2021)

Russian translation of RP 5C5.

4th Edition | January 2017 | Product Number: GX5C504R | Price: $224.00

RP 5C6
Pipe with Welded Connectors—Russian

Russian translation of RP 5C6.

3rd Edition | May 2018 | Reaffirmed: August 2024
Product Number: G05C63R | Price: $118.00

Spec 5DP
Drill Pipe—Russian
(includes Errata 1 dated July 2020)

Russian translation of Spec 5DP.

2nd Edition | May 2020 | Product Number: G5DP02R | Price: $245.00

Spec 5L
Line Pipe—Russian
(includes Errata 1 dated May 2018)

Russian translation of Spec 5L.

46th Edition | April 2018 | Product Number: G05L46R | Price: $353.00

RP 5L1
Recommended Practice for Railroad Transportation of Line Pipe—Russian

Russian translation of RP 5L1.

7th Edition | September 2009 | Reaffirmed: February 2024
Product Number: G5L107R | Price: $75.00

RP 5L3
Drop-Weight Tear Tests on Line Pipe—Russian
(includes Addendum 1 dated October 2020 and Errata 1 dated March 2021)

Russian translation of RP 5L3.

4th Edition | August 2014 | Reaffirmed: October 2020
Product Number: G5L304R | Price: $118.00

RP 5L8
Recommended Practice for Field Inspection of New Line Pipe—Russian

Russian translation of RP 5L8.

2nd Edition | December 1996 | Reaffirmed: May 2015
Product Number: G05L82R | Price: $155.00

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Spec 5LC
CRA Line Pipe—Russian
(includes Errata 1 dated October 2015)

Russian translation of Spec 5LC.

4th Edition | March 2015 | Reaffirmed: July 2020
Product Number: G5LC04R | Price: $217.00

Spec 5LCP
Specification on Coiled Line Pipe—Russian
(includes Errata 1 dated July 2007)

Russian translation of Spec 5LCP.

2nd Edition | October 2006 | Reaffirmed: July 2020
Product Number: G5LCP2R | Price: $181.00

Spec 5LD
CRA Clad or Lined Steel Pipe—Russian
(includes Errata 1 dated June 2017 and Addendum 1 dated February 2024)

Russian translation of Spec 5LD.

4th Edition | March 2015 | Reaffirmed: July 2020
Product Number: G5LD04R | Price: $180.00

RP 5LT
Recommended Practice for Truck Transportation of Line Pipe—Russian

Russian translation of RP 5LT.

1st Edition | March 2012 | Reaffirmed: April 2024
Product Number: G5LT01R | Price: $75.00

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

Russian translation of RP 5LW.

3rd Edition | September 2009 | Reaffirmed: May 2015
Product Number: G5LW03R | Price: $75.00

Spec 5ST
Specification for Coiled Tubing—U.S. Customary and SI Units—Russian
(includes Addendum 1 dated February 2024)

Russian translation of Spec 5ST.

1st Edition | April 2010 | Reaffirmed: July 2020
Product Number: G5ST01R | Price: $166.00

Bull 5T1
Imperfection and Defect Terminology—Russian

Russian translation of Bull 5T1.

11th Edition | October 2017 | Product Number: G05T111R | Price: $158.00

TR 5TP
Torque-Position Assembly Guidelines for API Casing and Tubing Connections—Russian

Russian translation of TR 5TP.

1st Edition | December 2013 | Product Number: G5TP01R | Price: $143.00

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

Russian translation of RP 5UE.

2nd Edition | June 2005 | Reaffirmed: July 2020
Product Number: G5UE02R | Price: $99.00

Chapter 5.1
General Considerations for Measurement by Meters—Russian
(includes Errata 1 dated June 2008 and Errata 2 dated June 2011)

Russian translation of Ch. 5.1.

4th Edition | September 2005 | Reaffirmed: December 2022
Product Number: H05014R | Price: $117.00

Chapter 5.2
Measurement of Liquid Hydrocarbons by Displacement Meters—Russian

Russian translation of Ch. 5.2.

3rd Edition | October 2005 | Reaffirmed: December 2020
Product Number: H50203R | Price: $109.00

Chapter 5.3
Measurement of Liquid Hydrocarbons by Turbine Meters—Russian
(includes Addendum 1 dated July 2009)

Russian translation of Ch. 5.3.

5th Edition | September 2005 | Reaffirmed: August 2014
Product Number: H50305R | Price: $131.00

Chapter 5.4
Accessory Equipment for Liquid Meters—Russian
(includes Errata 1 dated May 2015)

Russian translation of Ch. 5.4.

4th Edition | September 2005 | Reaffirmed: August 2015
Product Number:H05044R | Price: $117.00

Chapter 5.8
Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters—Russian
(ANSI/API *MPMS* Ch. 5.8-2011)

Russian translation of Ch. 5.8.

2nd Edition | November 2011 | Reaffirmed: May 2017
Product Number: H050802R | Price: $108.00

Spec 6A
Specification for Wellhead and Tree Equipment—Russian
(includes Errata 1 dated April 2019, Errata 2 dated June 2020, Addendum 1 dated July 2020, Errata 3 dated September 2020, Addendum 2 dated June 2021, Errata 4 dated September 2021, Addendum 3 dated August 2022, Addendum 4 dated November 2024, Errata 5 dated May 2024, and Errata 6 dated October 2024)

Russian translation of Spec 6A.

21st Edition | November 2018
Product Number: GX06A21R | Price: $355.00

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Std 6ACRA
Age-Hardened Nickel-Based Alloys for Oil and Gas Drilling and Production Equipment—Russian
(includes Errata 1 dated October 2015, Addendum 1 dated September 2017, Errata 2 dated February 2018, Addendum 2 dated September 2018, and Addendum 3 dated February 2019)

Russian translation of Std 6ACRA.

1st Edition | August 2015 | Product Number: G6ACRA1R | $108.00

TR 6AF
Technical Report on Capabilities of API Flanges Under Combinations of Load—Russian
(includes Errata 1 dated March 2017)

Russian translation of TR 6AF.

3rd Edition | September 2008 | Product Number: G6AF03R | Price: $187.00

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

Russian translation of Spec RP 6DR.

2nd Edition | May 2012 | Reaffirmed: January 2020
Product Number: G06DR2R | Price: $97.00

Spec 6DSS
Specification for Subsea Pipeline Valves—Russian
(includes Errata 1 dated May 2018, Errata 2 dated July 2018, Addendum 1 dated April 2019, and Addendum 2 dated June 2022)

Russian translation of Spec 6DSS.

3rd Edition | August 2017 | Product Number: G6DSS3R | Price: $204.00

Spec 7-2
Threading and Gauging of Rotary Shouldered Connections—Russian
(includes Errata 1 dated August 2017, Errata 2 dated November 2019, Addendum 1 dated March 2020, and Addendum 2 dated September 2023)

Russian translation of Spec 7-2.

2nd Edition | January 2017 | Product Number: GX70202R | Price: $236.00

Spec 7K
Drilling and Well Servicing Equipment—Russian
(includes Errata 1 dated May 2016, Errata 2 dated August 2016, and Errata 3 dated October 2017)

Russian translation of Spec 7K.

6th Edition | December 2015
Product Number: G07K06R | Price: $249.00

Chapter 8.3
Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products—Russian

Russian translation of Ch. 8.3.

2nd Edition | September 2019
Product Number: H08032R | Price: $83.00

Spec 8C
Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)—Russian
(includes Errata 1 dated May 2014 and Errata 2 dated November 2020)

Russian translation of Spec 8C.

5th Edition | April 2012 | Reaffirmed: August 2019
Product Number: G08C05R | Price: $175.00

Spec 10A
Cements and Materials for Well Cementing—Russian
(includes Addendum 1 dated November 2019 and Addendum 2 dated August 2022)

Russian translation of Spec 10A.

25th Edition | March 2019 | Product Number: GX10A25R | Price: $197.00

Spec 10F
Cementing Float Equipment Testing—Russian
(includes Errata 1 dated May 2020 and Errata 2 dated May 2020)

Russian translation of Spec 10F.

4th Edition | July 2018 | Product Number: GX10F04R | Price: $93.00

TR 10TR1
Cement Sheath Evaluation—Russian

Russian translation of TR 10TR1.

2nd Edition | September 2008
Product Number: G10TR12R | Price: $180.00

TR 10TR2
Shrinkage and Expansion in Oilwell Cements—Russian

Russian translation of TR 10TR2.

1st Edition | July 1997 | Reaffirmed: September 2002
Product Number: G10TR2R | Price: $133.00

TR 10TR3
Technical Report on Temperatures for API Cement Operating Thickening Time Tests—Russian

Russian translation of TR 10TR3.

1st Edition | May 1999 | Reaffirmed: May 2005
Product Number: G10TR3R | Price: $196.00

TR 10TR4
Selection of Centralizers for Primary Cementing Operations—Russian

Russian translation of TR 10TR4.

1st Edition | May 2008 | Product Number: G10TR40R | Price: $77.00

TR 10TR5
Methods for Testing of Solid and Rigid Centralizers—Russian

Russian translation of TR 10TR5.

1st Edition | May 2008 | Product Number: G10TR50R | Price: $77.00

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Translated Publications

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Spec 11AX
Specification for Subsurface Sucker Rod Pump Assemblies, Components, and Fittings—Russian
(includes Addendum 1 dated May 2019 and Errata 1 dated May 2023)

Russian translation of Spec 11AX.

13th Edition | May 2015 | Product Number: G11AX13R | Price: $217.00

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—Russian

Russian translation of Ch. 11.2.2M.

1st Edition | October 1986 | Reaffirmed: September 2017
Product Number: H27309R | Price: $213.00

Chapter 11.2.4
Temperature Correction for the Volume of NGL and LPG Tables 23E, 24E, 53E, 54E, 59E, 60E—Russian
(GPA 8217)

Russian translation of Ch. 11.2.4.

2nd Edition | June 2019 | Product Number: H1102042R | Price: $247.00

RP 13M/ISO 13503-1:2003
Recommended Practice for the Measurement of Viscous Properties of Completion Fluids—Russian
(RP 13M replaces RP 39)

Russian translation of RP 13M/ISO 13503-1:2003.

1st Edition | July 2004 | Product Number: GX13M01R | Price: $122.00

Spec 15HR
High-Pressure Fiberglass Line Pipe—Russian
(includes Errata 1 dated August 2016 and Errata 2 dated January 2021)

Russian translation of Spec 15HR.

4th Edition | February 2016 | Reaffirmed: April 2021
Product Number: G15HR4R | Price: $137.00

Spec 16F
Specification for Marine Drilling Riser Equipment—Russian
(includes Errata 1 dated February 2019 and Addendum 1 dated January 2021)

Russian translation of Spec 16F.

2nd Edition | November 2017 | Product Number: G16F02R | Price: $173.00

RP 16Q
Design, Selection, Operation and Maintenance of Marine Drilling Riser Systems—Russian
(includes Addendum 1 dated March 2023 and Addendum 2 dated March 2024)

Russian translation of RP 16Q.

2nd Edition | April 2017 | Product Number: G16Q02R | Price: $151.00

Spec 17E
Specification for Subsea Umbilicals—Russian
(includes Addendum 1 dated December 2017)

Russian translation of Spec 17E.

5th Edition | July 2017 | Product Number: G17E05R | Price: $241.00

RP 17N
Recommended Practice on Subsea Production System Reliability, Technical Risk, and Integrity Management—Russian
(includes Addendum 1 dated May 2018)

Russian translation of RP 17N.

2nd Edition | June 2017 | Product Number: G17N02R | Price: $222.00

TR 17TR1
Evaluation Standard for Internal Pressure Sheath Polymers for High Temperature Flexible Pipes—Russian

Russian translation of TR 17TR1.

1st Edition | March 2003 | Product Number: G17TR11R | Price: $164.00

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

Russian translation of TR 17TR3.

1st Edition | November 2004
Product Number: G17TR31R | Price: $164.00

TR 17TR4
Subsea Equipment Pressure Ratings—Russian

Russian translation of TR 17TR4.

2nd Edition | May 2016 | Product Number: G17TR402R | Price: $81.00

RP 17V
Recommended Practice for Analysis, Design, Installation, and Testing of Safety Systems for Subsea Applications—Russian
(includes Errata 1 dated July 2015)

Russian translation of RP 17V.

1st Edition | February 2015 | Reaffirmed: June 2020
Product Number: G17V01R | Price: $175.00

Std 19C
Measurement of and Specifications for Proppants Used in Hydraulic Fracturing and Gravel-Packing Operations—Russian

Russian translation of Std 19C.

2nd Edition | August 2018 | Product Number: GX19C02R | Price: $142.00

Spec 19OH
Openhole Isolation Equipment—Russian

Russian translation of Spec 19OH.

1st Edition | January 2018 | Product Number: G19OH1R | Price: $135.00

RP 59
Recommended Practice for Well Control Operations—Russian

Russian translation of RP 59.

2nd Edition | May 2006 | Reaffirmed: December 2018
Product Number: G59002R | Price: $152.00

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Translated Publications

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RP 85
Use of Subsea Wet-Gas Flowmeters in Allocation Measurement Systems—Russian
(includes Addendum 1 dated January 2013)
Russian translation of RP 85.
1st Edition | March 2003 | Reaffirmed: October 2013
Product Number: G08501R | Price: $134.00

Std 541
Form-Wound Squirrel Cage Induction Motors—375 kW (500 Horsepower) and Larger—Russian
Russian translation of Std 541.
5th Edition | December 2014 | Reaffirmed: May 2021
Product Number: C54105R | Price: $236.00

RP 551
Process Measurement Instrumentation—Russian
Russian translation of RP 551.
2nd Edition | February 2016 | Reaffirmed: April 2024
Product Number: C55102R | Price: $196.00

RP 553
Refinery Valves and Accessories for Control and Safety Instrumented Systems—Russian
Russian translation of RP 553.
2nd Edition | October 2012 | Product Number: C55302R | Price: $180.00

RP 556
Instrumentation, Control, and Protective Systems for Gas Fired Heaters—Russian
Russian translation of RP 556.
2nd Edition | April 2011 | Reaffirmed: April 2024
Product Number: C55602R | Price: $190.00

Std 619/ISO 10440-1:2007
Rotary-Type Positive Displacement Compressors for Petroleum, Petrochemical and Natural Gas Industries—Russian
(includes Errata 1 to datasheets dated August 2018)
Russian translation of Std 619/ISO 10440-1:2007.
5th Edition | December 2010| Reaffirmed: January 2023
Product Number: CX61905R | Price: $268.00

Std 660
Shell-and-Tube Heat Exchangers—Russian
(includes Addendum 1 dated August 2020)
Russian translation of Std 660.
9th Edition | March 2015 | Product Number: C66009R | Price: $230.00

Std 661
Petroleum, Petrochemical, and Natural Gas Industries—Air-Cooled Heat Exchangers for General Refinery Service—Russian
(ANSI/API Std 661)
Russian translation of Std 661.
7th Edition | July 2013 | Reaffirmed: July 2024
Product Number: C66107R | Price: $311.00

Std 670
Machinery Protection Systems—Russian
Russian translation of Std 670.
5th Edition | November 2014 | Reaffirmed: May 2022
Product Number: C67005R | Price: $243.00

Std 673
Centrifugal Fans for Petroleum, Chemical, and Gas Industry Services—Russian
Russian translation of Std 673.
3rd Edition | December 2014
Product Number: C67303R | Price: $212.00

Std 674
Positive Displacement Pumps—Reciprocating—Russian
(includes Errata 1 dated May 2014 and Errata 2 dated April 2015)
Russian translation of Std 674.
3rd Edition | December 2010 | Reaffirmed: November 2016
Product Number: C67403R | Price: $231.00

Std 675
Positive Displacement Pumps—Controlled Volume for Petroleum, Chemical, and Gas Industry Services—Russian
(includes Errata 1 dated June 2014 and Errata 2 dated April 2015)
Russian translation of Std 675.
3rd Edition | November 2012 | Reaffirmed: July 2021
Product Number: C67503R | Price: $158.00

Std 682
Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps—Russian
Russian translation of Std 682.
4th Edition | May 2014 | Reaffirmed: May 2022
Product Number: C68204R | Price: $317.00

Std 1104
Welding of Pipelines and Related Facilities—Russian
(includes Errata 1 dated September 2023)
Russian translation of Std 1104.
22nd Edition | July 2021 | Product Number: D110422R | Price: $470.00

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SPANISH *

Chapter 1
Vocabulary—Spanish [Historical]

Spanish translation of Ch. 1.

2nd Edition | July 1994 | Product Number: H010SP | Price: $118.00

Chapter 3.1A
Standard Practice for the Manual Gauging of Petroleum and Petroleum Products—Spanish
(includes Errata 1 dated January 2021)

Spanish translation of Ch. 3.1A.

3rd Edition | August 2013 | Reaffirmed: December 2018
Product Number: H301A03S | Price: $125.00

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.

4th Edition | October 2021 | Product Number: H301B4 | Price: $200.00

Chapter 3.2
Standard Practice for Gauging Petroleum and Petroleum Products in Tank Cars—Spanish

Spanish translation of Ch. 3.2.

1st Edition | August 1995 | Reaffirmed: May 2013
Product Number: H03021S | Price: $120.00

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 | Reaffirmed: December 2022
Product Number: H030316 | Price: $103.00

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 | Reaffirmed: August 2021
Product Number: H03041SP | Price: $103.00

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 | Reaffirmed: February 2013
Product Number: H03051S | Price: $90.00

Chapter 4.1
Introduction—Spanish

Spanish translation of Ch. 4.1.

3rd Edition | February 2005 | Reaffirmed: June 2014
Product Number: H40101S | Price: $102.00

Chapter 4.9.2
Methods of Calibration for Displacement and Volumetric Tank Provers, Part 2—Determination of the Volume of Displacement and Tank Provers by the Waterdraw Method of Calibration—Spanish

Spanish translation of Ch. 4.9.2.

1st Edition | December 2005 | Reaffirmed: May 2015
Product Number: H4.9.201S | Price: $226.00

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—Spanish

Spanish translation of Ch. 4.9.3.

1st Edition | April 2010 | Reaffirmed: March 2015
Product Number: H409031 | Price: $92.00

Chapter 5.1
General Considerations for Measurement by Meters—Spanish
(includes Errata 1 dated June 2008 and Errata 2 dated June 2011)

Spanish translation of Ch. 5.1.

4th Edition | September 2005 | Reaffirmed: December 2022
Product Number: H05014SP | Price: $117.00

Chapter 5.2
Measurement of Liquid Hydrocarbons by Displacement Meters—Spanish

Spanish translation of Ch. 5.2.

3rd Edition | October 2005 | Reaffirmed: December 2020
3Product Number: H50203SP | Price: $109.00

Chapter 5.3
Measurement of Liquid Hydrocarbons by Turbine Meters—Spanish
(includes Addendum 1 dated July 2009)

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

5th Edition | September 2005 | Reaffirmed: August 2014
Product Number: H50305SP | Price: $131.00

Chapter 5.4
Accessory Equipment for Liquid Meters—Spanish
(includes Errata 1 dated May 2015)

Spanish translation of Ch. 5.4.

4th Edition | September 2005 | Reaffirmed: August 2015
Product Number:H05044SP | Price: $117.00

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

Spanish translation of Ch. 5.5.

2nd Edition | July 2005 | Reaffirmed: August 2015
Product Number: H50502SP | Price: $87.00

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Chapter 5.8
Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters—Spanish
(ANSI/API *MPMS* Ch. 5.8-2011)

Spanish translation of Ch. 5.8.

2nd Edition | November 2011 | Reaffirmed: May 2017
Product Number: H050802SP | Price: $108.00

Chapter 6.2
Loading Rack Metering Systems—Spanish

Spanish translation of Ch. 6.2.

3rd Edition | February 2004 | Reaffirmed: July 2016
Product Number: H60203S | Price: $99.00

Chapter 7.3
Fixed Automatic Tank Temperature Systems—Spanish

Spanish translation of Ch. 7.3.

2nd Edition | October 2011 | Reaffirmed: September 2021
Product Number: H70302SP | Price: $103.00

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

Spanish translation of Ch. 7.5.

1st Edition | September 2014
Product Number: HH70501S | Price: $118.00

Chapter 8.1 ■
Standard Practice for Manual Sampling of Petroleum and Petroleum Products—Spanish
(ASTM D4057)

Spanish translation of Ch. 8.1.

6th Edition | September 2022
Product Number: H8.106SP | Price: $98.00

Chapter 8.2 ■
Standard Practice for Automatic Sampling of Petroleum and Petroleum Products—Spanish
(ASTM D4177)

Spanish translation of Ch. 8.2.

6th Edition | September 2022
Product Number: H8.206S | Price: $98.00

Chapter 8.6/ISO 8943
Refrigerated Light Hydrocarbon Fluids—Sampling of Liquified Natural Gas—Continuous and Intermittent Methods—Spanish
(ANSI/API *MPMS* Ch. 8.6-2020)

Spanish translation of Ch. 8.6.

1st Edition | May 2020 | Product Number: H8.601S | Price: $132.00

Chapter 9.4 ■
Continuous Density Measurement Under Dynamic (Flowing) Conditions—Spanish
(supersedes Ch. 14.6)

Spanish translation of Ch. 9.4.

1st Edition | January 2018
Product Number: H09041SP | Price: $199.00

Chapter 11.2.4 ■
Temperature Correction for the Volume of NGL and LPG Tables 23E, 24E, 53E, 54E, 59E, 60E—Spanish
(GPA 8217)

Spanish translation of Ch. 11.2.4.

2nd Edition | June 2019 | Product Number: H1102042SP | Price: $247.00

Chapter 11.3.3
Miscellaneous Hydrocarbon Product Properties—Denatured Ethanol Density and Volume Correction Factors—Spanish

Spanish translation of Ch. 11.3.3.

3rd Edition | May 2019 | Reaffirmed: October 2024
Product Number: H1103033S | Price: $193.00

Chapter 11.3.4 ■
Miscellaneous Hydrocarbon Product Properties—Denatured Ethanol and Gasoline Component Blend Densities and Volume Correction Factors—Spanish

Spanish translation of Ch. 11.3.4.

1st Edition | May 2019 | Product Number: H11030401S | Price: $217.00

Chapter 11.4.1
Properties of Reference Materials, Part 1—Density of Water and Water Volumetric Correction Factors for Water Calibration of Volumetric Provers—Spanish

Spanish translation of Ch. 11.4.1.

2nd Edition | July 2018 | Reaffirmed: August 2023
Product Number: H11412S | Price: $93.00

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.

4th Edition | February 2019 | Reaffirmed: October 2024
Product Number: H1201014 | Price: $151.00

Chapter 13.2 ■
Methods of Evaluating Meter Proving Data—Spanish

Spanish translation of Ch. 13.2.

2nd Edition | April 2018 | Product Number: H13022SP | Price: $117.00

Chapter 13.3
Measurement Uncertainty—Spanish

Spanish translation of Ch. 13.3.

2nd Edition | December 2017 | Reaffirmed: December 2022
Product Number: H130302S | Price: $141.00

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Chapter 17.1
Guidelines for Marine Cargo Inspection—Spanish
Spanish translation of Ch. 17.1.
7th Edition | February 2022 | Product Number: H170107S | Price: $206.00

Chapter 17.3
Guidelines for Identification of the Source of Free Waters Associated with Marine Petroleum Cargo Movements—Spanish
Spanish translation of Ch. 17.3.
2nd Edition | December 2016 | Reaffirmed: July 2021
Product Number: H170302S | Price: $150.00

Chapter 17.4
Method for Quantification of Small Volumes on Marine Vessels (OBQ/ROB)—Spanish
Spanish translation of Ch. 17.4.
2nd Edition | September 2016
Product Number: H170402S | Price: $137.00

Chapter 17.8
Guidelines for Pre-Loading Inspection of Marine Vessel Cargo Tanks and Their Cargo-Handling Systems—Spanish
Spanish translation of Ch. 17.8.
2nd Edition | August 2016 | Reaffirmed: January 2022
Product Number: H170802S | Price: $134.00

Chapter 17.12
Procedures for Bulk Liquid Chemical Cargo Inspections—Spanish
Spanish translation of Ch. 17.12.
2nd Edition | August 2015 | Product Number: H170122S | Price: $202.00

Chapter 18.2
Custody Transfer of Crude Oil from Lease Tanks Using Alternative Measurement Methods—Spanish
Spanish translation of Ch. 18.2.
1st Edition | July 2016 | Product Number: H180201S | Price: $155.00

Chapter 20.2
Production Allocation Measurement Using Single-Phase Devices—Spanish
Spanish translation of Ch. 20.2.
1st Edition | November 2016 | Product Number H200201S | Price: $154.00

Chapter 23.1 ■
Reconciliation of Liquid Pipeline Quantities—Spanish
(supersedes Std 2560)
Spanish translation of Ch. 23.1.
1st Edition | June 2016 | Product Number: H230101S | Price: $110.00

API 1509
Engine Oil Licensing and Certification System—Spanish
Spanish translation of API 1509.
21st Edition | February 2022 | For a free copy of this document, please visit https://www.api.org/products-and-services/engine-oil/documents/api-1509-documents

RP 1646
Safe Work Practices for Contractors Working at Retail Petroleum/Convenience Facilities—Spanish
Spanish translation of RP 1646.
2nd Edition | May 2017 | Reaffirmed: September 2022
Product Number: A164602S | Price: $182.00

UKRAINIAN *

Spec Q1
Quality Management System Requirements for Organizations Providing Products for the Petroleum and Natural Gas Industry—Ukrainian
(includes Errata 1 dated October 2023, Errata 2 dated October 2024, Errata 3 dated November 2024, and Addendum 1 dated October 2024)
Ukrainian translation of Spec Q1.
10th Edition | September 2023
Product Number: G0Q109U | Price: $160.00

RP 5A3
Thread Compounds for Casing, Tubing, Line Pipe, and Drill Stem Elements—Ukrainian
Ukrainian translation of RP 5A3.
4th Edition | February 2023 | Product Number: GX5A303U | Price: $195.00

RP 5A5/ISO 15463:2003
Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe—Ukrainian
(includes Errata 1 dated December 2009)
Ukrainian translation of RP 5A5/ISO 15463:2003.
7th Edition | June 2005 | Reaffirmed: January 2021
Product Number: GX5A507U | Price: $196.00

Spec 5B
Threading, Gauging, and Inspection of Casing, Tubing, and Line Pipe Threads—Ukrainian
(includes Errata 1 dated June 2018, Errata 2 dated December 2018, Addendum 1 dated December 2018, and Addendum 2 dated December 2019)
Ukrainian translation of Spec 5B.
16th Edition | December 2017 | Product Number: G5B016U | Price: $187.00

RP 5C1
Recommended Practice for Care and Use of Casing and Tubing—Ukrainian
Ukrainian translation of RP 5C1.
18th Edition | May 1999 | Reaffirmed: July 2020
Product Number: G05C18U | Price: $143.00

TR 5C3
Calculating Performance Properties of Pipe Used as Casing or Tubing—Ukrainian
Ukrainian translation of TR 5C3.
7th Edition | June 2018 | Product Number: G5C307U | Price: $281.00

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RP 5L1
Recommended Practice for Railroad Transportation of Line Pipe—Ukrainian

Ukrainian translation of RP 5L1.

7th Edition | September 2009 | Reaffirmed: February 2024
Product Number: G5L107U | Price: $75.00

RP 5L3
Drop-Weight Tear Tests on Line Pipe—Ukrainian
(includes Addendum 1 dated October 2020 and Errata 1 dated March 2021)

Ukrainian translation of RP 5L3.

4th Edition | August 2014 | Reaffirmed: October 2020
Product Number: G5L304U | Price: $118.00

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

Ukrainian translation of RP 5LW.

3rd Edition | September 2009 | Reaffirmed: May 2015
Product Number: G5LW03U | Price: $75.00

Bull 5T1
Imperfection and Defect Terminology—Ukrainian

Ukrainian translation of Bull 5T1.

11th Edition | October 2017 | Product Number: G05T11U | Price: $158.00

RP 7L ■
Procedures for Inspection, Maintenance, Repair, and Remanufacture of Drilling Equipment—Ukrainian
(includes Addendum 1 dated February 2006 and Addendum 2 dated March 2006)

Ukrainian translation of RP 7L.

1st Edition | December 1995 | Reaffirmed: August 2019
Product Number: G7L3A2UK | Price: $135.00

Spec 10A ■
Cements and Materials for Well Cementing—Ukrainian
(includes Addendum 1 dated November 2019 and Addendum 2 dated August 2022)

Ukrainian translation of Spec 10A.

25th Edition | March 2019 | Product Number: GX10A25U | Price: $197.00

RP 13B-1 ■
Recommended Practice for Field Testing Water-Based Drilling Fluids—Ukrainian
(includes Errata 1 dated May 2020, Errata 2 dated December 2021, and Errata 3 dated January 2023)

Ukrainian translation of RP 13B-1.

5th Edition | May 2019 | Product Number: GX13B15U | Price: $229.00

TR 17TR1 ■
Evaluation Standard for Internal Pressure Sheath Polymers for High Temperature Flexible Pipes—Ukrainian

Ukrainian translation of TR 17TR1.

1st Edition | March 2003 | Product Number: G17TR11U | Price: $164.00

RP 19B ■
Evaluation of Well Perforators—Ukrainian
(includes Addendum 1 dated March 2023)

Ukrainian translation of RP 19B.

3rd Edition | July 2021 | Product Number: G019B3 | Price: $176.00

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

Ukrainian translation of RP 100-1.

1st Edition | October 2015 | Reaffirmed: August 2020
Product Number: G100101U | Price: $113.00

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MPMS CHAPTER 11.1—1980

Chapter 11.1—1980 has not been withdrawn, but superseded. The 1980 standards should not be utilized on new applications. Chapter 11.1—2004 (page 63 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: $140.00

Chapter 11.1
Volume Correction Factors—Volume II

Table 5B—Generalized Products, Correction of Observed API Gravity to API Gravity at 60°F.

Table 6B—Generalized Products, Correction of Volume to 60°F Against API Gravity at 60°F.

August 1980 | Reaffirmed, March 1997 | Price: $140.00

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.

August 1980 | Reaffirmed, March 1997 | Price: $140.00

Chapter 11.1
Volume Correction Factors—Addendum to Volume III/IX Volume Correction—MTBE

Provides users of the API *Manual of Petroleum Measurement Standards* Chapter 11.1, Volume III (Table 6C) and Volume IX (Table 54C) with revised volume correction factor tables for MTBE. The tables can be used to expedite calculation of the volume of mixtures composed predominantly of MTBE at standard conditions from volumes at other conditions. These tables apply to commercially available mixtures containing at least 85 weight percent MTBE. The information gained from using these tables can be used to determine quantities of MTBE in tanks, shipping containers, and other storage containers typically used in the petroleum industry. Table 6C—Volume Correction Factors for Individual and Special Applications, Volume Correction 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: $140.00

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.

August 1980 | Reaffirmed, March 1997 | Price: $140.00

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.

August 1980 | Reaffirmed, March 1997 | Price: $140.00

Chapter 11.1
Volume Correction Factors—Volume VI

Table 24C—Volume Correction Factors for Individual and Special Applications, Volume Correction to 60°F Against Thermal Expansion Coefficients at 60°F.

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Chapter 11.1
Volume Correction Factors—Volume VII

Table 53A—Generalized Crude Oils, Correction of Observed Density to Density at 15°C.

Table 54A—Generalized Crude Oils, Correction of Volume to 15°C Against Density at 15°C.

August 1980 | Reaffirmed, March 1997 | Price: $140.00

Chapter 11.1
Volume Correction Factors—Volume VIII

Table 53B—Generalized Products, Correction of Observed Density to Density at 15°C.

Table 54B—Generalized Products, Correction of Volume to 15°C Against Density at 15°C.

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Chapter 11.1
Volume Correction Factors—Volume IX

Table 54C—Volume Correction Factors for Individual and Special Applications, Volume Correction to 15°C Against Thermal Expansion Coefficients at 15°C.

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Chapter 11.1
Volume Correction Factors—Volume X

Background, Development, and Computer Documentation, including computer subroutines in Fortran IV for all volumes of Chapter 11.1, except Volumes XI/XII, XIII, and XIV. Implementation procedures, including rounding and truncating procedures, are also included. These subroutines are not available through API in magnetic or electronic form. Pages: 403

August 1980 | Reaffirmed, March 1997 | Price: $140.00

Chapter 11.1
Volume Correction Factors—Volume XI/XII
Superseded by Chapter 11.5, Parts 1 to 3, 2009
(see page 60 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.

January 1980 | Reaffirmed, December 1999
Order from ASTM | 100 Barr Harbor Drive | West Conshohocken, PA 19428
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Chapter 11.1
Volume Correction Factors—Volume XIII

Table 5D—Generalized Lubricating Oils, Correction of Observed API Gravity to API Gravity at 60°F.

Table 6D—Generalized Lubricating Oils, Correction of Volume to 60°F Against API Gravity at 60°F.

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Chapter 11.1
Volume Correction Factors—Volume XIV

Table 53D—Generalized Lubricating Oils, Correction of Observed Density to Density at 15°C.

Table 54D—Generalized Lubricating Oils, Correction of Volume to 15°C Against Density at 15°C.

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Chapter 11.2.1
Compressibility Factors for Hydrocarbons: 0–90° API Gravity Range

Provides tables to correct hydrocarbon volumes metered under pressure to corresponding volumes at the equilibrium pressure for the metered temperature. It contains compressibility factors related to meter temperature and API gravity (60°F) of metered material. Pages: 149

1st Edition | August 1984 | Reaffirmed, May 1996 | Price: $153.00

Chapter 11.2.1M
Compressibility Factors for Hydrocarbons: 638–1074 Kilograms per Cubic Meter Range

Provides tables in metric (SI) units to correct hydrocarbon volumes metered under pressure to corresponding volumes at the equilibrium pressure for the metered temperature. It contains compressibility factors related to meter temperature and density (15 °C) of metered material. Pages: 187

1st Edition | August 1984 | Reaffirmed, May 1996 | Price: $153.00

Chapter 11.2
CD-ROM and Documentation of Chapters 11.2.1, 11.2.1M, 11.2.3, 11.2.3M

Includes tables found in Chapters 11.2.1, 11.2.1M, 11.2.3, and 11.2.3M, along with a computer documentation manual containing text information from those chapters. The tables, presented in both standard and metric (SI) units, cover compressibility factors for hydrocarbons and water calibration of volumetric provers. The tape is 9-track, 1600 bpi, unlabeled, 4-file type, and is available in either ASCII or EBCDIC format. Format desired must be specified when ordering. Now available on disk. Please specify when ordering.

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Chapter 11.2
Computer Tape Information and Documentation for Chapters 11.2.1, 11.2.1M, 11.2.3 and 11.2.3M

Provides only the text information from Chapters 11.2.1, 11.2.1M, 11.2.3 and 11.2.3M, and information pertaining to the use of the magnetic tape described above. The manual is included with orders for the magnetic tape. Pages: 11

1st Edition | 1984

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Rolled Shapes with Improved Notch Toughness

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Electrical Installations in Petroleum Processing Plants

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RP 684
API Standard Paragraphs Rotordynamic Tutorial: Lateral Critical Speeds, Unbalance Response, Stability, Train Torsionals, and Rotor Balancing

2nd Edition | August 2005

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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

Needs Assessment Survey Report, Product/Service Certification in the Exploration & Production Sector of the Worldwide Oil and Gas Industry

Offshore Operating Agreement, 2nd ed. 1996

Report of Eastern/Western Hemisphere Production of Casing, Tubing, and Drill Pipe, 1997–2004

Report of Eastern/Western Hemisphere Production of Line Pipe, 1997–2004

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- Book 6, Gas Lift, 1984

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2A-LRFD Planning, Designing and Constructing Fixed Offshore Platforms—Load and Resistance Factor Design, 1st ed. 1993

2A-LRFD-S1 Supplement 1 to Planning, Designing and Constructing Fixed Offshore Platforms—Load and Resistance Factor Design, 1st ed. 1997

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TR	410	Chromosome Aberrations in Chinese Hamster Ovary (CHO) Cells Exposed to Tertiary Amyl Methyl Ether (TAME)		1996	I00410	$95.00	136
TR	411	Chinese Hamster Ovary (CHO) HGPRT Mutation Assay of Tertiary Amyl Methyl Ether (TAME)		1996	I00411	$95.00	136
TR	412 and 414	A Range-Finding Developmental Inhalation Toxicity Study of Unleaded Gasoline Vapor Condensate in Rats and Mice via Whole-Body Exposure and an Inhalation Developmental Toxicity Study of Unleaded Gasoline Vapor Condensate in the Rat via Whole-Body Exposure		1998	I00412	$105.00	137
Publ	422	Groundwater Protection Programs for Petroleum Refining and Storage Facilities: A Guidance Document	1st	1994	C42201	$81.00	121
TR	425	Options for Minimizing Environmental Impacts of Inland Spill Response		2016	I42500	See Listing	152
RP	500	Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1, and Division 2	4th	2023	C50004	$337.00	108
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	2nd	2018	C50502	$246.00	108
API	510	Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration	11th	2022	C51011	$307.00	95
API	510	Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration—Japanese	11th	2022	C51011J	$307.00	95, 167
Std	520, Part I	Sizing, Selection, and Installation of Pressure-Relieving Devices—Part I—Sizing and Selection	10th	2020	C520110	$463.00	105
Std	520, Part II	Sizing, Selection, and Installation of Pressure-Relieving Devices—Part II—Installation	7th	2020	C5200207	$355.00	105
Std	521	Pressure-Relieving and Depressuring Systems	7th	2020	C52107	$395.00	105
TR	522	Technical Report on Pressure-Relief System Calculations	1st	2022	C52201	$75.00	105
Std	526	Flanged Steel Pressure-Relief Valves	8th	2023	C52608	$252.00	105
Std	527	Seat Tightness of Pressure Relief Valves	5th	2020	C52705	$130.00	105
Std	530	Calculation of Heater-Tube Thickness in Petroleum Refineries	7th	2015	C53007	$360.00	108
Std	534	Heat Recovery Steam Generators for Combustion Turbine Exhaust Applications	3rd	2024	C53403	$121.00	108
Std	535	Burners for Fired Heaters in General Refinery Services	4th	2024	C53504	$220.00	108

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Std	536	Post-Combustion NOx Control for Equipment in General Refinery and Petrochemical Services	3rd	2017	C53603	$208.00	109
Std	537	Flare Details for Petroleum, Petrochemical, and Natural Gas Industries	4th	2024	C53704	$305.00	109
RP	538	Industrial Fired Boilers for General Refinery and Petrochemical Service	1st	2015	C53801	$378.00	109
Std	541	Form-Wound Squirrel Cage Induction Motors—375 kW (500 Horsepower) and Larger	5th	2014	C54105	$236.00	108
Std	541	Form-Wound Squirrel Cage Induction Motors—375 kW (500 Horsepower) and Larger—Russian	5th	2014	C54105R	$236.00	108, 172
Std	546	Brushless Synchronous Machines—500 kVA and Larger	4th	2022	C54604	$258.00	108
Std	547	General Purpose Form-Wound Squirrel Cage Induction Motors—185 kW (250 hp) Through 2240 kW (3000 hp)	2nd	2017	C54702	$147.00	108
RP	551	Process Measurement Instrumentation	2nd	2016	C55102	$196.00	110
RP	551	Process Measurement Instrumentation—Russian	2nd	2016	C55102R	$196.00	110, 172
RP	552	Transmission Systems	1st	1994	C55201	$203.00	110
RP	553	Refinery Valves and Accessories for Control and Safety Instrumented Systems	2nd	2012	C55302	$180.00	110
RP	553	Refinery Valves and Accessories for Control and Safety Instrumented Systems—Russian	2nd	2012	C55302R	$180.00	110, 172
RP	554, Part 1	Process Control Systems, Part 1—Process Control Systems Functions and Functional Specification Development	3rd	2021	C55403	$174.00	111
RP	554, Part 2	Process Control Systems, Part 2—Process Control System Design	2nd	2023	C554202	$174.00	111
RP	554, Part 3	Process Control Systems, Part 3—Project Execution and Process Control System Ownership	2nd	2021	C554302	$132.00	111
API	555	Process Analyzers	3rd	2013	C55503	$236.00	111
RP	556	Instrumentation, Control, and Protective Systems for Gas Fired Heaters	2nd	2011	C55602	$190.00	111
RP	556	Instrumentation, Control, and Protective Systems for Gas Fired Heaters—Russian	2nd	2011	C55602R	$190.00	111, 172
RP	557	Guide to Advanced Control Systems	2nd	2013	C55702	$137.00	111
Std	560	Fired Heaters for General Refinery Service	5th	2016	C56005	$416.00	109
Std	565	Thermal Reactors for Sulfur Recovery Units in General Refinery Services	1st	2022	C56501	$207.00	109
API	570	Piping Inspection Code: In-Service Inspection, Rating, Repair, and Alteration of Piping Systems	5th	2024	C57005	$229.00	95, 106
RP	571	Damage Mechanisms Affecting Fixed Equipment in the Refining Industry	3rd	2020	C57103	$450.00	95, 112
RP	571	Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Chinese	3rd	2020	C57103C	$450.00	95, 113, 166
RP	571	Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Japanese	3rd	2020	C57103J	$450.00	95, 113, 167
RP	572	Inspection Practices for Pressure Vessels	5th	2023	C57205	$292.00	95
RP	573	Inspection of Fired Boilers and Heaters	4th	2021	C57304	$195.00	95, 109
RP	574	Inspection Practices for Piping System Components	5th	2024	C57405	$266.00	95, 106
RP	575	Inspection Practices for Atmospheric and Low-Pressure Storage Tanks	5th	2024	C57505	$265.00	95
RP	576	Inspection of Pressure-Relieving Devices	5th	2024	C57605	$266.00	96, 106
RP	577	Welding Processes, Inspection, and Metallurgy	3rd	2020	C57703	$308.00	96
RP	578	Material Verification Program for New and Existing Assets	4th	2023	C57804	$242.00	96, 106
API	579-1/ ASME FFS-1	Fitness-For-Service	4th	2022	C57904	$1,460.00	96
API	579-2/ ASME PTB-14-2023	Fitness-For-Service Example Problems Manual	2nd	2024	C57922	$224.00	96
RP	580	Elements of a Risk-Based Inspection Program	4th	2023	C58004	$363.00	96
RP	581	Risk-Based Inspection Methodology	3rd	2016	C58103	$1,007.00	96
RP	582	Welding Guidelines for the Chemical, Oil, and Gas Industries	4th	2023	C58204	$166.00	97, 113
RP	583	Corrosion Under Insulation and Fireproofing	2nd	2021	C58302	$231.00	97
RP	583	Corrosion Under Insulation and Fireproofing—Japanese	2nd	2021	C58302J	$231.00	97, 167
RP	584	Integrity Operating Windows	2nd	2021	C58402	$160.00	97
RP	585	Pressure Equipment Integrity Incident Investigation	2nd	2021	C58502	$170.00	97
Bulll	587	Guidance for the Development of Ultrasonic Examiner Qualification Programs	1st	2021	C58701	$108.00	97
RP	588	Recommended Practice for Source Inspection and Quality Surveillance of Fixed Equipment	1st	2019	C58801	$212.00	97
RP	591	Process Valve Qualification Procedure	6th	2019	C59106	$137.00	106
Std	594	Check Valves: Flanged, Lug, Wafer, and Butt-Welding	9th	2022	C59409	$162.00	106
Std	598	Valve Inspection and Testing	11th	2023	C59811	$116.00	106
Std	599	Metal Plug Valves—Flanged, Threaded, and Welding Ends	8th	2020	C59908	$132.00	106
Std	600	Steel Gate Valves—Flanged and Butt-Welding Ends, Bolted Bonnets	14th	2021	C60014	$167.00	106
Std	602	Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries	11th	2022	C60211	$168.00	107
Std	603	Corrosion-Resistant, Bolted Bonnet Gate Valves—Flanged and Butt-Welding Ends	9th	2018	C60309	$118.00	107
Std	607	Fire Test for Quarter-Turn Valves and Valves Equipped with Nonmetallic Seats	8th	2022	C60708	$120.00	107
Std	608	Metal Ball Valves—Flanged, Threaded, and Welding Ends	6th	2020	C60806	$155.00	107

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Std	610	Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries	12th	2021	C61012	$200.00	98
Std	611	General-Purpose Steam Turbines for Petroleum, Chemical, and Gas Industry Services	6th	2022	C61106	$200.00	98
Std	612	Petroleum Petrochemical, and Natural Gas Industries—Steam Turbines—Special-Purpose Applications	8th	2020	C61208	$301.00	98
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Std	614	Lubrication, Shaft-Sealing, and Oil-Control Systems and Auxiliaries	6th	2022	CX61405	$402.00	98
RP	615	Valve Selection Guide	3rd	2022	C61503	$119.00	107
Std	616	Gas Turbines for the Petroleum, Chemical, and Gas Industry Services	6th	2022	C61606	$280.00	98
Std	617	Axial and Centrifugal Compressors and Expander-Compressors	9th	2022	C61709	$328.00	98
Std	618	Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services	6th	2024	C61806	$229.00	98
Std	619/ISO 10440-1:2007	Rotary-Type Positive Displacement Compressors for Petroleum, Petrochemical and Natural Gas Industries	5th	2010	CX61905	$268.00	99
Std	619/ISO 10440-1:2007	Rotary-Type Positive Displacement Compressors for Petroleum, Petrochemical and Natural Gas Industries—Russian	5th	2010	CX61905R	$268.00	99, 172
Std	620	Design and Construction of Large, Welded, Low-Pressure Storage Tanks	12th	2013	C62012	$540.00	102
Std	620	Design and Construction of Large, Welded, Low-Pressure Storage Tanks—Chinese	12th	2013	C62012C	$540.00	102, 166
RP	621	Reconditioning of Metallic Gate, Globe, and Check Valves	5th	2022	C62105	$186.00	107
Std	622	Type Testing of Process Valve Packing for Fugitive Emissions	3rd	2018	C62203	$192.00	107
Std	623	Steel Globe Valves—Flanged and Butt-Welding Ends, Bolted Bonnets	2nd	2021	C62302	$108.00	107
Std	624	Type Testing of Rising Stem Valves Equipped with Graphite Packing for Fugitive Emissions	2nd	2023	C62402	$109.00	107
Std	625	Tank Systems for Refrigerated Liquefied Gas Storage	1st	2010	C62501	$289.00	103
Std	641	Type Testing of Quarter-Turn Valves for Fugitive Emissions	2nd	2023	C64102	$97.00	108
Std	650	Welded Tanks for Oil Storage	13th	2020	C65013	$682.00	103
RP	651	Cathodic Protection of Aboveground Petroleum Storage Tanks	5th	2024	G65105	$160.00	103
RP	652	Linings of Aboveground Petroleum Storage Tank Bottoms	5th	2020	C65205	$187.00	103
Std	653	Tank Inspection, Repair, Alteration, and Reconstruction	5th	2014	C65305	$293.00	97, 103
Std	653	Tank Inspection, Repair, Alteration, and Reconstruction—Chinese	5th	2014	C65305C	$293.00	98, 103, 166
Std	653	Tank Inspection, Repair, Alteration, and Reconstruction—Portuguese	5th	2014	C65305P	$293.00	98, 103, 167
TR	654	Aboveground Storage Tank Caulking or Sealing the Bottom Edge Projection to the Foundation	1st	2019	C65401	$140.00	104
TR	655	Vapor Corrosion Inhibitors for Storage Tanks	1st	2021	C65501	$82.00	104
Std	660	Shell-and-Tube Heat Exchangers	9th	2015	C66009	$230.00	109
Std	660	Shell-and-Tube Heat Exchangers—Russian	9th	2015	C66009	$230.00	109, 172
Std	661	Petroleum, Petrochemical, and Natural Gas Industries—Air-Cooled Heat Exchangers for General Refinery Service	7th	2013	C66107	$311.00	110
Std	661	Petroleum, Petrochemical, and Natural Gas Industries—Air-Cooled Heat Exchangers for General Refinery Service—Russian	7th	2013	C66107R	$311.00	110, 172
Std	663	Hairpin Type Heat Exchangers	2nd	2022	C66302	$239.00	110
Std	664	Spiral Plate Heat Exchangers	1st	2014	C66401	$217.00	110
Std	667	Plate-and-Frame Heat Exchangers	1st	2022	C66701	$115.00	110
Std	668	Brazed Aluminum Plate-Fin Heat Exchangers	1st	2018	C66801	$175.00	110
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Std	670	Machinery Protection Systems	5th	2014	C67005	$243.00	99
Std	670	Machinery Protection Systems—Russian	5th	2014	C67005R	$243.00	99, 172
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Std	672	Packaged, Integrally Geared Centrifugal Air Compressors for Petroleum, Chemical, and Gas Industry Services	5th	2019	C67205	$379.00	99
Std	673	Centrifugal Fans for Petroleum, Chemical, and Gas Industry Services	3rd	2014	C67303	$212.00	99
Std	673	Centrifugal Fans for Petroleum, Chemical, and Gas Industry Services—Russian	3rd	2014	C67303R	$212.00	99, 172
Std	674	Positive Displacement Pumps—Reciprocating	3rd	2010	C67403	$231.00	99
Std	674	Positive Displacement Pumps—Reciprocating—Russian	3rd	2010	C67403R	$231.00	99, 172
Std	675	Positive Displacement Pumps—Controlled Volume for Petroleum, Chemical, and Gas Industry Services	3rd	2012	C67503	$158.00	100
Std	675	Positive Displacement Pumps—Controlled Volume for Petroleum, Chemical, and Gas Industry Services—Russian	3rd	2012	C67503R	$158.00	100, 172
Std	676	Positive Displacement Pumps—Rotary	4th	2009	C67604	$204.00	100
Std	677	General-Purpose, Extruder, and Epicyclic Gear Units for Petroleum, Chemical, and Gas Industry Services	4th	2021	C67704	$223.00	100

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Std	682	Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps—Chinese	4th	2014	C68204C	$317.00	100, 166
Std	682	Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps—Russian	4th	2014	C68204R	$317.00	100, 172
TR	684-1	API Standard Paragraphs Rotordynamic Tutorial: Lateral Critical Speeds, Unbalance Response, Stability, Train Torsionals, and Rotor Balancing	1st	2019	C684101	$296.00	100
Std	685	Sealless Centrifugal Pumps for Petroleum, Petrochemical, and Gas Industry Process Service	3rd	2022	C68503	$280.00	100
RP	686	Recommended Practice for Machinery Installation and Installation Design	2nd	2009	C68602	$232.00	101
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Std	688	Pulsation and Vibration Control for Positive Displacement Machinery Systems for Petroleum, Chemical, and Natural Gas Industry Services	2nd	2023	C68802	$200.00	101
RP	691	Risk-Based Machinery Management	1st	2017	C69101	$202.00	101
Std	692	Dry Gas Sealing Systems for Axial, Centrifugal, and Rotary Screw Compressors and Expanders	1st	2018	C69201	$204.00	101
RP	697	Pump Repair	1st	2023	C69701	$362.00	101
RP	751	Safe Operation of Hydrofluoric Acid Alkylation Units	5th	2021	K75105	$223.00	121
RP	752	Management of Hazards Associated with Location of Process Plant Permanent Buildings	4th	2024	C75204	$176.00	120, 124
RP	753	Management of Hazards Associated with Location of Process Plant Portable Buildings	2nd	2024	C75302	$176.00	120, 124
RP	754	Process Safety Performance Indicators for the Refining and Petrochemical Industries	3rd	2021	K75403	$208.00	120, 124
RP	755	Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries	2nd	2019	K75502	$176.00	120, 124
TR	755-1	Technical Support Document for ANSI/API RP 755, Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries	1st	2010	K755101	$112.00	120, 125
RP	756	Management of Hazards Associated with Location of Process Plant Tents	2nd	2024	C75602	$164.00	120, 125
TR	756-1	Process Plant Tent Responses to Vapor Cloud Explosions—Results of the American Petroleum Institute Tent Testing Program	1st	2014	C756101	$206.00	120, 125
Publ	770	A Manager's Guide to Reducing Human Errors—Improving Human Performance in the Process Industries	1st	2001	K77001	$82.00	125
Std	780	Security Risk Assessment Methodology for the Petroleum and Petrochemical Industries	1st	2013	K78001	$236.00	94, 121, 125
RP	781	Facility Security Plan Methodology for the Oil and Natural Gas Industries	1st	2016	K78101	$180.00	94, 122
Publ	800	Literature Survey: Subsurface and Groundwater Protection Related to Petroleum Refinery Operations	1st	1988	C80000	$100.00	121
TR	932-A	A Study of Corrosion in Hydroprocess Reactor Effluent Air Cooler Systems	2nd	2002	C932A0	$164.00	113
RP	932-B	Design, Materials, Fabrication, Operation, and Inspection Guidelines for Corrosion Control in Hydroprocessing Reactor Effluent Air Cooler (REAC) Systems	3rd	2019	C932B03	$335.00	113
TR	932-C	Use of Duplex Stainless Steels in Hydroprocessing Reactor Effluent Air Coolers (REACs)	1st	2022	C932C01	$125.00	113
RP	934-A	Materials and Fabrication of 2 ¼Cr-1Mo, 2 ¼Cr-1Mo-¼V, 3Cr-1Mo, and 3Cr-1Mo-¼V Steel Heavy Wall Pressure Vessels for High-Temperature, High-Pressure Hydrogen Service	3rd	2019	C934A03	$198.00	113
TR	934-B	Fabrication Considerations for Vanadium-Modified Cr-Mo Steel Heavy Wall Pressure Vessels	2nd	2022	C934B02	$183.00	113
RP	934-C	Materials and Fabrication of 1 ¼Cr-½Mo Steel Heavy Wall Pressure Vessels for High-Pressure Hydrogen Service Operating at or Below 825 °F (440 °C)	2nd	2019	C934C02	$143.00	114
TR	934-D	Technical Report on the Materials and Fabrication Issues of 1¼Cr-½Mo and 1Cr-½Mo Steel Pressure Vessels	1st	2010	C934D01	$146.00	114
RP	934-E	Recommended Practice for Materials and Fabrication of 1¼Cr-½ Mo Steel Pressure Vessels for Service Above 825 °F (440 °C)	2nd	2018	C934E02	$175.00	114
TR	934-F, Part 1	Impact of Hydrogen Embrittlement on Minimum Pressurization Temperature for Thick-Wall Cr-Mo Steel Reactors in High-Pressure H2 Service—Initial Technical Basis for RP 934-F	1st	2017	C934F101	$231.00	114
TR	934-F, Part 2	Literature Review of Fracture Mechanics-Based Experimental Data for Internal Hydrogen-Assisted Cracking of Vanadium-Modified 2-¼Cr-1Mo Steel	1st	2017	C934F201	$154.00	115
TR	934-F, Part 3	Subcritical Cracking of Modern 2¼Cr-1Mo-¼V Steel Due to Dissolved Internal Hydrogen and H2 Environment, Research Report	1st	2017	C934F01	$217.00	115
TR	934-F, Part 4	The Effects of Hydrogen for Establishing a Minimum Pressurization Temperature (MPT) for Heavy Wall Steel Reactor Vessels	1st	2018	C934F401	$224.00	115
RP	934-G	Design, Fabrication, Operational Effects, Inspection, Assessment, and Repair of Coke Drums and Peripheral Components in Delayed Coking Units	1st	2016	C934G01	$187.00	115
TR	934-H	Inspection, Assessment, and Repair of Heavy Wall Reactor Vessels in High-Temperature High-Pressure Hydrogen Service	1st	2022	C934H01	$131.00	115
TR	934-J	Inspection, Assessment and Repair of Coke Drums and Peripheral Components in Delayed Coking Units	1st	2021	C934J01	$132.00	115
Publ	935	Thermal Conductivity Measurement Study of Refractory Castables	1st	1999	C93501	$76.00	115
Std	936	Refractory Installation Quality Control—Inspection and Testing Monolithic Refractory Linings and Materials	5th	2024	C93605	$160.00	115
Publ	937	Evaluation of Design Criteria for Storage Tanks with Frangible Roof Joints	1st	1996	C93701	$146.00	104

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Publ	938-A	An Experimental Study of Causes and Repair of Cracking of 1¼Cr-½ Mo Steel Equipment	1st	1996	C93801	$178.00	116
Publ	938-B	Use of 9Cr-1Mo-V (Grade 91) Steel in the Oil Refining Industry	1st	2008	C938B01	$118.00	116
TR	938-C	Use of Duplex Stainless Steels in the Oil Refining Industry	4th	2024	C938C04	$224.00	116
Publ	939-A	Research Report on Characterization and Monitoring of Cracking in Wet H2S Service	1st	1994	C93901	$170.00	116
Publ	939-B	Repair and Remediation Strategies for Equipment Operating in Wet H2S Service	1st	2002	C939B0	$185.00	116
RP	939-C	Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries	2nd	2019	C939C02	$181.00	116
TR	939-D	Stress Corrosion Cracking of Carbon Steel in Fuel Grade Ethanol— Review, Experience Survey, Field Monitoring, and Laboratory Testing	2nd	2007	C939D0	$199.00	104, 116
Bull	939-E	Identification, Repair, and Mitigation of Cracking of Steel Equipment in Fuel Ethanol Service	2nd	2013	C939E02	$174.00	116
RP	941	Steels for Hydrogen Service at Elevated Temperatures and Pressures in Petroleum Refineries and Petrochemical Plants	8th	2016	C94108	$175.00	117
TR	941-A	The Technical Basis Document for API RP 941	1st	2008	C09410	$235.00	117
TR	942-A	Materials, Fabrication, and Repair Considerations for Hydrogen Reformer Furnace Outlet Pigtails and Manifolds	1st	2014	C942A01	$175.00	117
TR	942-B	Material, Fabrication, and Repair Considerations for Austenitic Alloys Subject to Embrittlement and Cracking in High Temperature 565 °C to 760 °C (1050 °F to 1400 °F) Refinery Services	1st	2017	C942B01	$215.00	117
RP	945	Avoiding Environmental Cracking in Amine Units	4th	2022	C94504	$126.00	118
Publ	959	Characterization Study of Temper Embrittlement of Chromium-Molybdenum Steels	1st	1982	C95900	$196.00	118
RP	970	Corrosion Control Document Systems	2nd	2023	C97002	$225.00	118
Std	975	Refractory Installation Quality Control—Inspection and Testing of Refractory Brick Systems and Materials	1st	2021	C97501	$108.00	118
Std	976	Refractory Installation Quality Control—Inspection and Testing of AES/RCF Linings and Materials	2nd	2024	C97602	$153.00	118
TR	977	ASTM C704 Test Variability Reduced to Allow Further Optimization of Erosion-Resistant Refractories for Critical Oil Refining Applications	1st	2018	C97701	$142.00	118
TR	978	Monolithic Refractories: Manufacture, Properties, and Selection	1st	2019	C97801	$140.00	118
TR	979	Applications of Refractory Lining Materials	1st	2018	C97901	$167.00	119
TR	980	Monolithic Refractories: Installation and Dryout	1st	2018	G98001	$180.00	119
TR	981	Thermal Expansion Under Load and Creep of Refractories—An Evaluation and Comparison of Testing Methods	1st	2021	C98101	$101.00	119
RP	982	Inspection and Assessment of Refractory Linings	1st	2023	C98201	$174.00	119
TR	997	Comprehensive Report of API Crude Oil Characterization Measurements	1st	2000	C99701	$228.00	112
RP	1004	Bottom Loading and Vapor Recovery for MC-306 & DOT-406 Tank Motor Vehicles	8th	2003	A10048	$138.00	83, 93
RP	1007	Loading and Unloading of MC 306/DOT 406 Cargo Tank Motor Vehicles	1st	2001	A10071	$42.00	84, 94
RP	1102	Steel Pipelines Crossing Railroads and Highways	7th	2007	D11021	$144.00	87
Std	1104	Welding of Pipelines and Related Facilities	22nd	2021	D110422	$470.00	87, 93
Std	1104	Welding of Pipelines and Related Facilities—Chinese	22nd	2021	D110422C	$470.00	88, 93, 167
Std	1104	Welding of Pipelines and Related Facilities—Russian	22nd	2021	D110422R	$470.00	88, 93, 172
RP	1109	Line Markers and Signage for Hazardous Liquid Pipelines and Facilities	5th	2017	D11095	$122.00	88
RP	1110	Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids, or Carbon Dioxide	7th	2022	D111007	$118.00	88
RP	1111	Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines (Limit State Design)	5th	2015	D11115	$175.00	88
RP	1112	Developing a Highway Emergency Response Plan for Incidents Involving Hazardous Materials	3rd	1997	A11123	$82.00	84, 94
RP	1115	Design and Operation of Solution-Mined Salt Caverns Used for Liquid Hydrocarbon Storage	2nd	2018	D11152	$195.00	88
RP	1117	Recommended Practice for Movement in In-Service Pipelines	3rd	2008	D11173	$164.00	88
RP	1130	Computational Pipeline Monitoring for Liquids	2nd	2022	D011302	$140.00	89
RP	1133	Managing Hydrotechnical Hazards for Pipelines Located Onshore or Within Coastal Areas	2nd	2017	D11332	$201.00	89
RP	1145	Preparation of Response Plans for Oil Spills from Offshore Facilities	2nd	2018	D11452	$150.00	50
TR	1149	Pipeline Variable Uncertainties and Their Effects on Leak Detectability	2nd	2015	D11492	$204.00	89
TR	1149-3	Canine Oil Detection: Field Trials Report		2016	I114930	See Listing	153
TR	1149-4	Canine Oil Detection (K9-SCAT) Guidelines		2016	I114940	See Listing	153
TR	1151-4	Mechanical Treatment of Sand Beaches Historical Library Report			I115140	See Listing	153
TR	1152	Industry Recommended Subsea Dispersant Monitoring Plan		2020	I115201	See Listing	153
TR	1153-1	Tidal Inlet Protection Strategies (TIPS): Phase 1—Final Report		2014	I115310	See Listing	153
TR	1153-2	Tidal Inlet Protection Strategies (TIPS) Field Guide		2016	I115320	See Listing	153
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TR	1154-2	Sunken Oil Detection and Recovery Operational Guide		2016	I115420	See Listing	153

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TR	1155-2	Shoreline In Situ Treatment (Sediment Mixing and Relocation) Fact Sheet		2016	I115520	See Listing	154
TR	1155-3	Shoreline In Situ Treatment (Sediment Mixing and Relocation) Job Aid		2016	I115530	See Listing	154
RP	1160	Managing System Integrity for Hazardous Liquid Pipelines	3rd	2019	D116003	$259.00	89
RP	1161	Pipeline Operator Qualification (OQ)	5th	2021	D11615	$247.00	89
RP	1162	Public Awareness Programs for Pipeline Operators	3rd	2022	D116203	$165.00	89
Std	1163	In-Line Inspection Systems Qualification	3rd	2021	D11632	$163.00	89
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TR	1166	Excavation Monitoring and Observation for Damage Prevention	2nd	2015	D11662	$131.00	90
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RP	1168	Pipeline Control Room Management	2nd	2015	D11682	$113.00	90
RP	1168	Pipeline Control Room Management—Portuguese	2nd	2015	D11682P	$113.00	90, 167
RP	1169	Pipeline Construction Inspection	2nd	2020	D11692	$225.00	90
RP	1169	Pipeline Construction Inspection—Chinese	2nd	2020	D11692	$225.00	90, 167
RP	1170	Design and Operation of Solution-Mined Salt Caverns Used for Natural Gas Storage	2nd	2022	D117002	$225.00	90
RP	1171	Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs	2nd	2022	D117102	$225.00	91
RP	1172	Recommended Practice for Construction Parallel to Existing Underground Transmission Pipelines	1st	2014	D11721	$107.00	91
RP	1173	Pipeline Safety Management Systems	1st	2015	D117301	$107.00	91
RP	1174	Recommended Practice for Onshore Hazardous Liquid Pipeline Emergency Preparedness and Response	1st	2015	D11741	$116.00	91
RP	1175	Pipeline Leak Detection—Program Management	2nd	2022	D11752	$199.00	91
RP	1176	Recommended Practice for Assessment and Management of Cracking in Pipelines	1st	2016	D117601	$208.00	91
RP	1177	Recommended Practice for Steel Pipeline Construction Quality Management Systems	1st	2017	D110701	$147.00	92
Bull	1178	Integrity Data Management and Integration	2nd	2024	D11782	$129.00	92
TR	1179	Hydrostatic Testing as an Integrity Management Tool	1st	2019	D11791	$142.00	92
RP	1181	Pipeline Operational Status Determination	1st	2019	D11811	$79.00	92
RP	1182	Construction, Operation, and Maintenance of Large Diameter Rural Gas Gathering Lines	1st	2020	D11821	$79.00	92
RP	1183	Assessment and Management of Pipeline Dents	1st	2020	D11831	$214.00	92
RP	1184	Pipeline Facilities Construction Inspection	1st	2021	D11841	$165.00	92
RP	1185	Pipeline Public Engagement	1st	2024	D118501	$144.00	92
RP	1187	Pipeline Integrity Management of Landslide Hazards	1st	2024	G118701	$160.00	92
RP	1188	Hazardous Liquid Pipeline Facilities Integrity Management	1st	2022	D11881	$119.00	93
TR	1190	Crack ILI Response: Maximum Depth and Failure Pressure Ratio	1st	2024	D11901	$69.00	93
TR	1253	API Selection and Training Guidelines for In Situ Burning Personnel		2016	I12530	See Listing	154
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RP	1525	Bulk Oil Testing, Handling, and Storage Guidelines	2nd	2021	F15252	See Listing	82
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RP	1543	Documentation, Monitoring and Laboratory Testing of Aviation Fuel During Shipment from Refinery to Airport	1st	2009	A154301	$75.00	81
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Publ	1612	Guidance Document for Discharging of Petroleum Distribution Terminal Effluents to Publicly Owned Treatment Works	1st	1996	A16121	$120.00	85
RP	1615	Installation of Underground Petroleum Storage Systems	6th	2011	A16156	$255.00	82
RP	1621	Bulk Liquid Stock Control at Retail Outlets	5th	1993	A16210	$103.00	82
RP	1626	Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Filling Stations	2nd	2010	A16262	$193.00	82
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Publ	1629	Guide for Assessing and Remediating Petroleum Hydrocarbons in Soils	1st	1993	A16290	$187.00	85
Std	1631	Interior Lining and Periodic Inspection of Underground Storage Tanks	5th	2001	A16315	$108.00	82
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Publ	1638	Waste Management Practices for Petroleum Marketing Facilities	1st	1994	A16381	$94.00	85
RP	1639	Owner/Operator's Guide to Operation and Maintenance of Vapor Recovery Systems at Gasoline Dispensing Facilities	1st	2003	A16391	$108.00	83
RP	1640	Product Quality in Light Product Storage and Handling Operations	2nd	2021	A164002	$259.00	83
Publ	1642	Alcohol, Ethers, and Gasoline-Alcohol and -Ether Blends	1st	1996	A16421	$76.00	83
RP	1646	Safe Work Practices for Contractors Working at Retail Petroleum/Convenience Facilities	2nd	2017	A164602	$182.00	83
RP	1646	Safe Work Practices for Contractors Working at Retail Petroleum/Convenience Facilities—Spanish	2nd	2017	A164602S	$182.00	83, 175
Publ	1669	Results of a Retail Gasoline Outlet and Commercial Parking Lot Storm Water Runoff Study	1st	1994	A16691	$103.00	85
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Publ	1835	Study of Used Motor Oil Recycling in Eleven Selected Countries	1st	1997	B18351	$65.00	83
Std	2000	Venting Atmospheric and Low-Pressure Storage Tanks	7th	2014	C20007	$279.00	106
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RP	2009	Safe Welding, Cutting, and Hot Work Practices in the Petroleum and Petrochemical Industries	8th	2022	K20098	$120.00	126
Std	2015	Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks	9th	2024	K201509	$293.00	104, 128
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Publ	2377	1998 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry		1999	K23771	$104.00	127, 135
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Std	2554	Measurement and Calibration of Tank Cars	1st	1966	H25540	$143.00	54
Std	2555	Liquid Calibration of Tanks	1st	1966	H25550	$120.00	54
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Publ	4546	Hazard Response Modeling Uncertainty (a Quantitative Method): Evaluation of Commonly-Used Hazardous Gas Dispersion Models—Volume 2		1992	I45460	$154.00	134
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Publ	4599	Interlaboratory Study of Three Methods for Analyzing Petroleum Hydrocarbons in Soils		1994	I47990	$115.00	144
Publ	4600	Metals Criteria for Land Management of Exploration and Production Wastes: Technical Support Document of API Recommended Guidance Values		1995	I46000	$65.00	160

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April 28—30	API Pipeline Conference and Expo: Pipeline, Control Room and Cybernetics	Austin, TX
May 5—9	Spring Refining and Equipment Standards Meeting	San Francisco, CA
May 7	API/AFPM Spring Operating Practices Symposium	San Francisco, CA
June 16—20	Summer Exploration and Production Standards Meeting	Scottsdale, AZ
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