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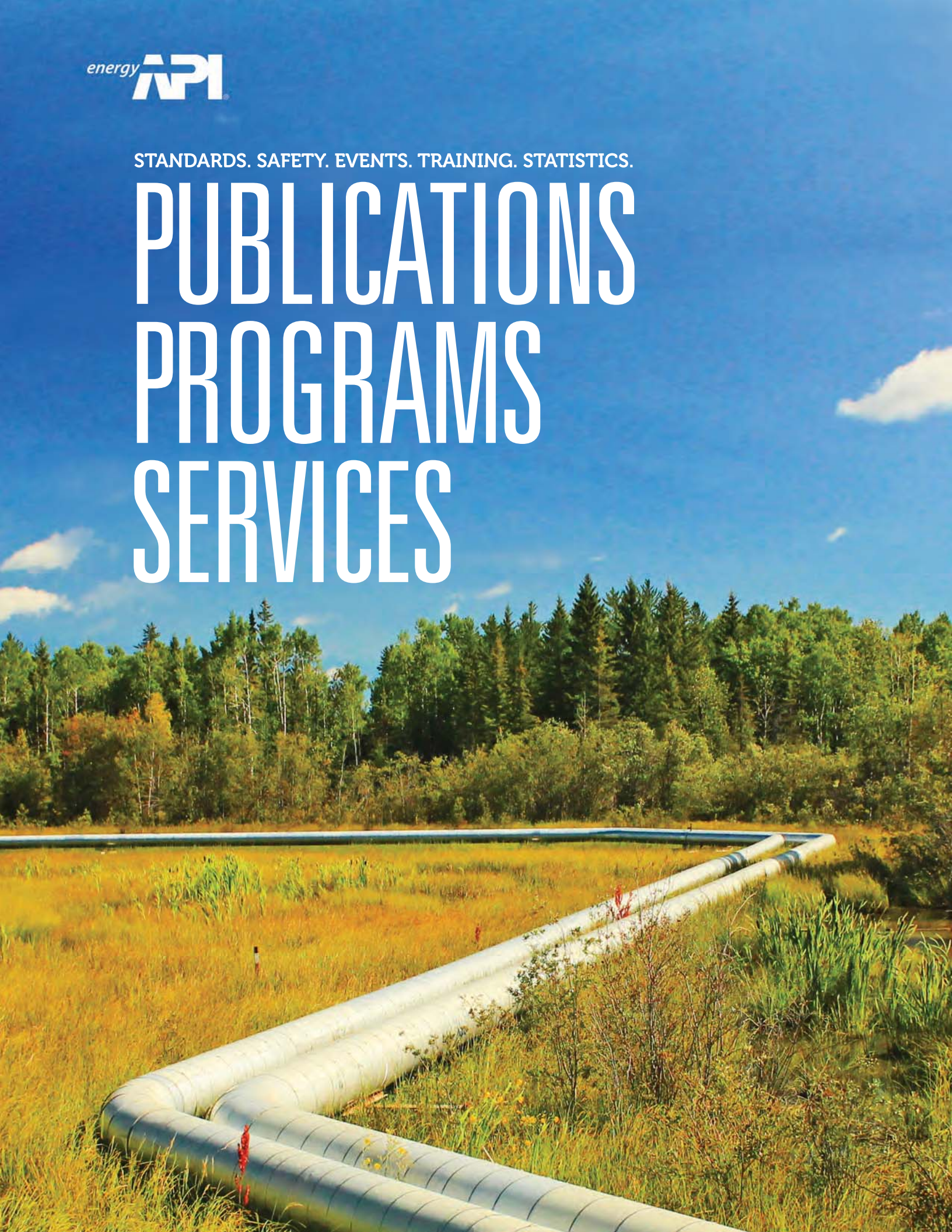

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API is pleased to present its 2017 publications programs and services catalog.

The 2017 edition lists API standards, recommended practices, equipment specifications, other technical documents, and reports and studies to help the oil and natural gas industry safely, efficiently, and responsibly supply energy to billions of people around the world.

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

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

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

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

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

Sincerely,

Lakshmy A. Mahon
Director, Global Industry Services
API

2017 Publications Programs and Services
Table of Contents

Exploration and Production **1**

- General: Oil Field Equipment and Materials 1
- Offshore Structures 2
- Derricks and Masts 7
- Tubular Goods 7
- Valves and Wellhead Equipment 12
- Drilling Equipment 15
- Hoisting Tools 17
- Wire Rope 17
- Oil Well Cements 18
- Production Equipment 20
- Lease Production Vessels 23
- Drilling Fluid Materials 24
- Offshore Safety and Antipollution 26
- Fiberglass and Plastic Pipe 28
- Drilling Well Control Systems 28
- Subsea Production Systems 30
- Completion Equipment 36
- Supply Chain Management 39
- Drilling and Production Operations 40
  - Training 42
- Special Publications 43
- Voluntary Operating Agreements and Bulletins 43
- Health, Environment, and Safety
  - Exploration and Production Safety Standards 44
  - General 46
  - Naturally Occurring Radioactive Materials 46
  - Waste 47
- Security 47

Petroleum Measurement **49**

- Manual of Petroleum Measurement Standards 49

Marketing **73**

- General 73
- Aviation 73
- Marketing Operations 74
- Used Oil 75
- Tank Truck Operations 75
- Motor Oils and Lubricants 76
- Diesel Fuel 76
- Health, Environment, and Safety
  - General 76
  - Waste 77
  - Water 77
  - Soil and Groundwater 77
- Security 77

Transportation **79**

- Rail Transportation 79
- Pipeline Public Education and Awareness 79
- Pipeline Operations Publications 79
- Pipeline Maintenance Welding 84
- Tank Truck Operations 85
- Security 85

Refining **87**

- Inspection of Refinery Equipment 87
- Mechanical Equipment Standards for Refinery Service 90
  - Equipment Datasheets 93
- Storage Tanks 94
- Pressure-Relieving Systems for Refinery Service 97
- Piping Component and Valve Standards 98
- Electrical Installations and Equipment 101
- Heat Transfer Equipment Standards for Refinery Service 102
- Instrumentation and Control Systems 104
- Technical Data Book Petroleum Refining 105
  - Related Items 105
- Characterization and Thermodynamics 105
- Materials Engineering Publications 106
- Petroleum Products and Petroleum Product Surveys 110
- Process Safety Standards 110
- Health, Environment, and Safety
  - General 112
  - Soil and Groundwater 112
- Security 113

Safety and Fire Protection **115**

- Upstream Safety Standards 115
- Multi-Segment Publications 117
- Storage Tank Safety Standards 122

Health and Environmental Issues **125**

- Air Research 125
  - Emissions: General 125
  - Emissions: Exploration and Production 127
  - Emissions: Marketing 128
  - Emissions: Refining 128
  - Emissions: Vehicles 129
  - Exposure: Assessment and Monitoring 130
  - Modeling 131
  - Ozone 131
- Environment and Safety Data 131
- Human Health Related Research 132
- Natural Resource Damage Assessment 134
- Pollution Prevention 134
- Soil and Groundwater Research 136
  - Contaminant Fate and Transport 137
  - Remedial Technologies 138
  - Site Characterization 140
- Environmental Stewardship Program Publications 141
- Storage Tank Research 142
- Surface Water Research 143
  - Biomonitoring 145
  - Effluents: Exploration and Production 146
  - Effluents: Marketing 146
  - Effluents: Refining 147
  - Oil Spills 147
  - Oil Spills: MSRC Reports 151
  - Biennial Oil Spill Conference Proceedings 153
  - Sediments 154
- Waste Research 154

2017 Publications Programs and Services

Table of Contents

API Data Products **157**

- API Data 157

Policy and Economic Studies **159**

- Discussion Papers 159
- Research Studies 159
- Other Publications 160
- Papers on Specific Issues 160

Communications and Education Outreach **161**

Translated Publications **163**

- Chinese 163
- Kazakh 166
- Portuguese 167
- Russian 167
- Spanish 170

Historical Publications **173**

- *MPMS* Chapter 11.1—1980 173
- Withdrawn in 2016 174
- Withdrawn Publications 174

Publications by Number **189**

Title Listing for Unnumbered Publications **215**

Meetings, Conferences, Workshops, and Training Courses **217**

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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 ◆

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

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

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

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

Spec Q1 *

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

Chinese translation of Spec Q1.

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

Spec Q1 *

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

Portuguese translation of Spec Q1.

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

Spec Q1 *

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

Russian translation of Spec Q1.

9th Edition | June 2013 | Product Number: G0Q109R | Price: $96.00

Spec Q1 *

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

Spanish translation of Q1.

9th Edition | June 2013 | Product Number: G0Q109SP | Price: $120.00

Spec Q2 ◆

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

(includes Addendum 1 dated June 2016)

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

1st Edition | December 2011 | 2-Year Extension: August 2016
Product Number: G0Q201 | Price: $80.00

Spec Q2 *

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

Chinese translation of Spec Q2.

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

Spec Q2 *

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

Portuguese translation of Spec Q2.

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

Spec Q2 *

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

Russian translation of Spec Q2.

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

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Spec Q2 *
Specification for Quality Management System Requirements for Service Supply Organization for the Petroleum and Natural Gas Industries—Spanish

Spanish translation of Q2.

1st Edition | December 2011 | Product Number: G0Q201SP | Price: $80.00

RP 1FSC
Facilities Systems Completion Planning and Execution

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

1st Edition | July 2013 | Product Number: G1FSC01 | Price: $60.00

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

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

- the completion of the well requires completion equipment or well control equipment assigned a pressure rating greater than 15,000 psig 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: $147.00

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: $65.00

OFFSHORE STRUCTURES

API OSRC
Proceedings of the 2014 Offshore Structural Reliability Conference

The 2014 Offshore Structural Reliability Conference was hosted by API for the same purposes as similar past events such as the DIRT (Design–Inspect–Redundancy–Triangle) Conference in 1983, the series of Civil Engineering in the Oceans conferences by the American Society of Civil Engineers (ASCE), and the Reliability of Offshore Structures Workshop by the Association of Oil & Gas Producers (OGP) in 2012 [now the International Association of Oil & Gas Producers (IOGP)].

Practitioners and end-users of structural reliability methods were brought together for the purpose of sharing the collective knowledge of applying reliability theories and operating experiences in order to address the offshore design and operational challenges facing the industry. These proceedings contain the material presented at this conference that included alternating sessions of instruction and topical papers starting with the history of offshore reliability studies, progressed to current activities, and then finally outlined issues for future resolution. This event was of interest for operators, engineers, regulators, academics, and anyone else involved in the design and operations of offshore structures. Pages: 602

1st Edition | December 2015 | Product Number: GOSRC01 | Price: Free*

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
Product Number: G2AWSD22 | Price: $395.00

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: January 2012
Product Number: G02B06 | Price: $83.00

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

Chinese translation of Spec 2B.

6th Edition | July 2001 | Product Number: G02B06C | Price: $59.00

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Spec 2C ◆
Offshore Pedestal-Mounted Cranes
(includes Errata 1 dated March 2013)

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: 124

7th Edition | March 2012 | Effective Date: October 1, 2012
Product Number: G02C07 | Price: $143.00

Spec 2C *
Offshore Pedestal-Mounted Cranes—Chinese

Chinese translation of Spec 2C.

7th Edition | March 2012 | Product Number: G02C07C | Price: $101.00

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

Intended to serve as a guide to crane owners and operators in developing operating and maintenance practices and procedures for use in the safe operation of pedestal-mounted revolving cranes on fixed or floating offshore platforms, jackup drilling rigs, semi-submersible drilling rigs and other types of mobile offshore drilling units (MODUs). Guidelines are also given for the pre-use inspection and testing of temporary cranes (also called self-erecting, leapfrog or bootstrap cranes) that are erected offshore.

Equipment (e.g. davits, launch frames) used only for launching life-saving appliances (life boats or life rafts) are not included in the scope of this document. Pages: 120

7th Edition | December 2014 | Product Number: G02D07 | Price: $145.00

RP 2EQ/ISO 19901-2:2004
Seismic Design Procedures and Criteria for Offshore Structures

Contains requirements for defining the seismic design procedures and criteria for offshore structures and is a modified adoption of ISO 19901-2. The intent of the modification is to map the requirements of ISO 19901-2 to the United States' offshore continental shelf (U.S. OCS). The requirements are applicable to fixed steel structures and fixed concrete structures. The effects of seismic events on floating structures and partially buoyant structures are also briefly discussed. The site-specific assessment of jack-ups in elevated condition is only covered to the extent that the requirements are applicable. This document defines the seismic requirements for new construction of structures in accordance with RP 2A-WSD, 22nd Edition and later. Earlier editions of RP 2A-WSD are not applicable. Only earthquake-induced ground motions are addressed in detail. Other geologically induced hazards such as liquefaction, slope instability, faults, tsunamis, mud volcanoes, and shock waves are mentioned and briefly discussed. The requirements are intended to reduce risks to persons, the environment, and assets to the lowest levels that are reasonably practicable.

This edition of RP 2EQ is the modified national adoption of ISO 19901-2:2004. Pages: 54

1st Edition | November 2014 | Product Number: GG2EQ01 | Price: $125.00

Spec 2F ◆
Specification for Mooring Chain

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

6th Edition | June 1997 | Reaffirmed: June 2015
Product Number: G02F06 | Price: $89.00

Spec 2F *
Specification for Mooring Chain—Chinese

Chinese translation of Spec 2F.

6th Edition | June 1997 | Product Number: G02F06C | Price: $63.00

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

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

1st Edition | April 2006 | Reaffirmed: January 2012
Product Number: G2FB01 | Price: $157.00

RP 2FPS
Planning, Designing, and Constructing Floating Production Systems

Provides guidelines for design, fabrication, installation, inspection, and operation of floating production systems (FPSs). A FPS may be designed with the capability of one or more stages of hydrocarbon processing, as well as drilling, well workover, product storage, and export. This document addresses only floating systems where a buoyant hull of some form supports the deck, production, and other systems. Bottom-fixed components, such as self-supporting risers, and station keeping systems, such as turret mooring, catenary anchor leg mooring (CALM), single anchor leg mooring (SALM), etc. are considered as ancillary components and are addressed in more detail in other API recommended practices. Pages: 191

2nd Edition | October 2011 | Product Number: G2FPS02 | Price: $186.00

RP 2GEO/ISO 19901-4:2003
Geotechnical and Foundation Design Considerations
(includes Addendum 1 dated October 2014)

Contains requirements and recommendations for those aspects of geoscience and foundation engineering that are applicable to a broad range of offshore structures, rather than to a particular structure type. Such aspects are site characterization, soil and rock characterization, design and installation of foundations supported by the seabed (shallow foundations), identification of hazards, and design of pile foundations.

Aspects of soil mechanics and foundation engineering that apply equally to offshore and onshore structures are not addressed. The user of this document is expected to be familiar with such aspects.

This edition of RP 2GEO is the modified national adoption of ISO 19901-4:2003. Pages: 103

1st Edition | April 2011 | Product Number: GG2GEO01 | Price: $154.00

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

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

9th Edition | July 2006 | Effective Date: February 1, 2007
Reaffirmed: January 2012 | Product Number: G02H09 | Price: $94.00

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

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

1st Edition | May 2009 | Product Number: G2HINS01 | Price: $83.00

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

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

- inspection guidelines for steel permanent moorings on permanent floating installations are added;
- inspection guidelines for fiber ropes used for permanent and MODU moorings 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: June 2015
Product Number: G02I03 | Price: $148.00

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

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

4th Edition | May 1996 | Effective Date: June 1, 1996
Reaffirmed: January 2012 | Product Number: G02L04 | Price: $83.00

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

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

The requirements are divided into two broad types:

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

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

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

Metocean parameters are applicable to

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

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

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

RP 2MOP/ISO 19901-6:2009
Marine Operations
(includes Errata 1 dated April 2015)

Provides requirements and guidance for the planning and engineering of marine operations, encompassing the design and analysis of the components, systems, equipment, and procedures required to perform marine operations, as well as the methods or procedures developed to carry them out safely. This document is also applicable to modifications of existing structures, e.g. installation of additional topsides modules.

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

1st Edition | July 2010 | Reaffirmed: April 2015
Product Number: GG2MOP1 | Price: $243.00

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

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

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

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

Spec 2MT2 ◆
Rolled Shapes with Improved Notch Toughness

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

1st Edition | June 2002 | Effective Date: December 1, 2002
Reaffirmed: June 2015 | Product Number: G2MT21 | Price: $79.00

RP 2N/ISO 19906:2010
Planning, Designing, and Constructing Structures and Pipelines for Arctic Conditions

Specifies requirements and provides recommendations and guidance for the design, construction, transportation, installation, and removal of offshore structures, related to the activities of the petroleum and natural gas industries in arctic and cold regions. Reference to arctic and cold regions includes both the Arctic and other cold regions that are subject to similar sea ice, iceberg, and icing conditions. The objective of this standard is to ensure that offshore structures in arctic and cold regions provide an appropriate level of reliability with respect to personnel safety, environmental protection, and asset value to the owner, to the industry, and to society in general.

This standard does not contain requirements for the operation, maintenance, service-life inspection, or repair of arctic and cold region offshore structures, except where the design strategy imposes specific requirements. While this standard does not apply specifically to mobile offshore drilling units, the procedures relating to ice actions and ice management contained herein are applicable to the assessment of such units. This standard does not apply to mechanical, process, and electrical equipment or any specialized process equipment associated with arctic and cold region offshore operations except in so far as it is necessary for the structure to sustain safely the actions imposed by the installation, housing, and operation of such equipment.

This edition of RP 2N is the modified national adoption of ISO 19906:2010. Pages: 458

3rd Edition | April 2015 | Product Number: G02N03 | Price: $199.00

Std 2RD
Dynamic Risers for Floating Production Systems

Addresses structural analysis procedures, design guidelines, component selection criteria, and typical designs for all new riser systems used on FPSs. Guidance is also given for developing load information for the equipment attached to the ends of the risers. The recommended practice for structural design of risers, as reflected in this document, is generally based on the principles of limiting stresses in the risers and related components under normal, extreme, and accidental conditions. This document assumes that the risers will be made of steel or titanium pipe or unbonded flexible pipe. However, other materials, such as aluminum, are not excluded if risers built using these materials can be shown to be fit for purpose. Design considerations for unbonded flexible pipe are included primarily by reference to RP 17B and Spec 17J. Pages: 81

2nd Edition | September 2013 | Product Number: G2RD02 | Price: $245.00

Bull 2S
Design of Windlass Wildcats for Floating Offshore Structures

Covers the design of windlass wildcats to ensure proper fit and function between wildcat and mooring chain. Wildcats are of the five-whelp type for use with studlink anchor chain conforming to the classification society Grades 1, 2, and 3, ORQ and Grade 4 chain. Wildcat dimensions are provided for chains in integral $^{1}/_{8}$ in. (3 mm) steps, ranging in size from 2 in. to 4 in. (51 mm to 102 mm). Wildcat dimensions for 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: $76.00

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

Castings manufactured to this specification are intended for use in the fabrication of offshore structures, manufacture of critical marine or mechanical or other system components intended for application on permanent offshore structures, or for components used in the construction of offshore tendons, risers and pipelines. This specification is based on the experience acquired during the design, construction, operation, and maintenance of offshore processing units and permanent facilities, as supplemented with the experience of operating companies with topsides, fixed platforms, floating structures (e.g. 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: June 2015 | Product Number: G2SC01 | Price: $114.00

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

Forgings manufactured to this specification are intended for use in the fabrication of offshore structures, marine risers, TLP tendons and pipelines, or other system components intended for application on permanent offshore structures. This specification defines the minimum requirements for manufacture, testing, and inspection of carbon and low-alloy steel forgings, including extrusions and heavy-wall seamless tubular product, grades 345 N/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 | Product Number: G2SF01 | Price: $85.00

RP 2SIM
Structural Integrity Management of Fixed Offshore Structures

Serves as a guide for the structural integrity management of fixed offshore structures used for the drilling, development, production, and storage of hydrocarbons in offshore areas. Specific guidance is provided for the evaluation of structural damage, above and below water structural inspection, fitness-for-purpose assessment, risk reduction, and mitigation planning, and the process of decommissioning.

The SIM process provided in this recommended practice is applicable to platforms installed at any location worldwide. However, this recommended practice also provides specific metocean criteria, which are only applicable for use in fitness-for-purpose assessments of platforms located in the U.S. Gulf of Mexico and the U.S. West Coast. Pages: 97

1st Edition | November 2014 | Product Number: G2SIM01 | Price: $170.00

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

Presents a rational method for analyzing, designing, or evaluating mooring systems used with floating units. This method provides a uniform analysis tool that, when combined with an understanding of the environment at a particular location, the characteristics of the unit being moored, and other factors, can be used to determine the adequacy and safety of the mooring system. Some design guidelines for dynamic positioning systems are also included. Appendix K of 2SK replaces RP 95F. Pages: 181

3rd Edition | October 2005 | Reaffirmed: June 2015
Product Number: G2SK03 | Price: $127.00

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

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

This document applies to synthetic fiber ropes used in the form of taut leg or catenary moorings for both permanent and temporary offshore installations such as:

- monohull-based floating production, storage, and 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 | Product Number: G2SM02 | Price: $185.00

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: $227.00

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: $51.00

Bull 2U
Bulletin on Stability Design of Cylindrical Shells

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

3rd Edition | June 2004 | Product Number: G02U03 | Price: $191.00

Bull 2V
Design of Flat Plate Structures
(includes Errata 1 dated March 2008)

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

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

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

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

5th Edition | December 2006 | Effective Date: June 1, 2007
Reaffirmed: January 2012 | Product Number: G02W05 | Price: $94.00

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

Russian translation of Spec 2W.

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

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

Contains guidance on commonly used NDE methods such as visual (VT), penetrant (PT), magnetic particle (MT), radiography (RT), and ultrasonic (UT) examinations, which are routinely used in offshore structural fabrication. This recommended practice primarily addresses the MT and UT methods. Guidance on VT, PT, and RT is incorporated by reference to AWS D1.1. Further recommendations are offered for determining the qualifications of personnel using MT and UT techniques. Recommendations are also offered for the integration of these techniques into a general quality control program. The interrelationship between joint design, the significance of defects in welds, and the ability of NDE personnel to detect critical-size defects is also discussed. Pages: 77

4th Edition | May 2004 | Reaffirmed: June 2015
Product Number: G02X04 | Price: $147.00

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

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

5th Edition | December 2006 | Effective Date: June 1, 2007
Reaffirmed: January 2012 | Product Number: G02Y05 | Price: $94.00

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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: June 2015
Product Number: G02Z04 | Price: $119.00

RP 95J
Gulf of Mexico Jackup Operations for Hurricane Season

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

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

1st Edition | June 2006 | Reaffirmed: April 2013
Product Number: G95J01 | Price: $62.00

DERRICKS AND MASTS

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

Covers the design, manufacture, and use of steel derricks, portable masts, crown block assemblies, and substructures suitable for drilling and well-servicing operations in the petroleum industry. It includes requirements for marking, inspection, a uniform method of rating, and design loading for the equipment. This specification provides two product specification levels (PSLs) that define two levels of technical and quality requirements. Pages: 52

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

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

Chinese translation of Spec 4F.

4th Edition | January 2013 | Product Number: G04F04C | Price: $81.00

RP 4G
Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures
(includes Addendum 1 dated August 2016)

Provides guidelines and establishes recommended procedures for inspection, maintenance, and repair of items for drilling and well servicing structures to maintain the serviceability of this equipment. These recommendations should be considered as supplemental to, and not as a substitute for, the manufacturer's instructions and the recommendations in RP 54. Items of drilling and well servicing structures covered are masts/derricks, substructures, and their accessories. Pages: 57

4th Edition | April 2012 | 2-Year Extension: July 2016
Product Number: G04G04 | Price: $116.00

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

Chinese translation of RP 4G.

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

TUBULAR GOODS

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

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

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

3rd Edition | November 2009 | Reaffirmed: April 2015
Product Number: GX5A303 | Price: $145.00

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

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

This edition of RP 5A5 is the identical national adoption of ISO 15463:2003. Pages: 118

7th Edition | June 2005 | Reaffirmed: April 2015
Product Number: GX5A507 | Price: $157.00

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

Chinese translation of RP 5A5.

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

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

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

15th Edition | April 2008 | Effective Date: October 1, 2008
Reaffirmed: April 2015 | Product Number: G5B015 | Price: $118.00

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

Chinese translation of Spec 5B.

15th Edition | April 2008 | Product Number: G05B15C | Price: $83.00

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

Kazakh translation of Spec 5B.

15th Edition | April 2008 | Product Number: G05B15K | Price: $95.00

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

Russian translation of Spec 5B.

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

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

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

5th Edition | August 1999 | Reaffirmed: May 2015
Product Number: G05B105 | Price: $142.00

RP 5B1 *
Gauging and Inspection of Casing, Tubing and Line Pipe Threads—Kazakh

Kazakh translation of RP 5B1.

5th Edition | August 1999 | Product Number: G05B15K | Price: $114.00

RP 5B1 *
Gauging and Inspection of Casing, Tubing and Pipe Line Threads—Russian

Russian translation of RP 5B1.

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

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

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

18th Edition | May 1999 | Reaffirmed: May 2015
Product Number: G05C18 | Price: $115.00

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

Chinese translation of RP 5C1.

18th Edition | May 1999 | Product Number: G05C18C | Price: $81.00

TR 5C3/ISO 10400:2007
Technical Report on Equations and Calculations for Casing, Tubing, and Line Pipe used as Casing or Tubing; and Performance Properties Tables for Casing and Tubing
(includes Addendum 1 dated October 2015)

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

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

This edition of TR 5C3 is the identical national adoption of ISO 10400:2007 and supersedes Bull 5C2 and Bull 5C3. Pages: 378

1st Edition | December 2008 | Product Number: G5C301 | Price: $206.00

RP 5C5 ■
Procedures for Testing Casing and Tubing Connections

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: 210

4h Edition | January 2017 | Product Number: GX5C504 | Price: $180.00

RP 5C6
Welding Connections to Pipe

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

2nd Edition | March 2006 | Reaffirmed: September 2012
Product Number: G05C62 | Price: $86.00

RP 5C6 *
Welding Connections to Pipe—Chinese

Chinese translation of RP 5C6.

2nd Edition | March 2006 | Product Number: G05C62C | Price: $61.00

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: G05C81 | Price: $120.00

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Spec 5CRA/ISO 13680:2008 ◆
Specification for Corrosion Resistant Alloy Seamless Tubes for Use as Casing, Tubing and Coupling Stock
(includes Errata 1 dated August 2011)

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

This edition of Spec 5CRA is the identical national adoption of ISO 13680:2010. Pages: 87

1st Edition | February 2010 | Effective Date: August 1, 2010
Reaffirmed: April 2015 | Product Number: GG5CRA01 | Price: $155.00

Spec 5CT ◆
Specification for Casing and Tubing
(includes Errata 1 dated September 2012 and Errata 2 dated October 2016)

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

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

This standard specifies the technical delivery conditions for steel pipes (casing, tubing, and pup joints), coupling stock, coupling material, and accessory material and establishes requirements for three Product Specification Levels (PSL-1, PSL-2, PSL-3). The requirements for PSL-1 are the basis of this standard. The requirements that define different levels of standard technical requirements for PSL-2 and PSL-3, for all grades except H-40, L-80 9Cr, and C110, are contained in Annex H. This standard can also be applied to tubulars with connections not covered by API standards. This standard is not applicable to threading requirements. This standard is based on the 8th Edition of Spec 5CT. Pages: 269

9th Edition | July 2011 | Effective Date: January 1, 2012
2-Year Extension: July 2016 | Product Number: G5CT09 | Price: $237.00

Spec 5CT *
Specification for Casing and Tubing—Chinese

Chinese translation of Spec 5CT.

9th Edition | July 2011 | Product Number: G5CT09C | Price: $166.00

Spec 5CT *
Specification for Casing and Tubing—Portuguese

Portuguese translation of Spec 5CT.

9th Edition | July 2011 | Product Number: G5CT09P | Price: $237.00

Spec 5CT *
Specification for Casing and Tubing—Russian

Russian translation of Spec 5CT.

9th Edition | July 2011 | Product Number: G5CT09R | Price: $190.00

Spec 5CT *
Specification for Casing and Tubing—Spanish

Spanish translation of Spec 5CT.

9th Edition | July 2011 | Product Number: G5CT09SP | Price: $237.00

Spec 5DP/ISO 11961:2008 ◆
Specification for Drill Pipe

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

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

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

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

1st Edition | August 2009 | Effective Date: August 1, 2010
Reaffirmed: April 2015 | Product Number: GX5DP01 | Price: $181.00

Spec 5DP/ISO 11961:2008 *
Specification for Drill Pipe—Chinese

Chinese translation of Spec 5DP.

1st Edition | August 2009 | Product Number: GX5DP01C | Price: $127.00

Spec 5L ◆
Specification for Line Pipe
(includes Errata 1 dated April 2015)

Specifies requirements for the manufacture of two product specification levels (PSL 1 and PSL 2) of seamless and welded steel pipes for use in pipeline transportation systems in the petroleum and natural gas industries. Pages: 180

45th Edition | December 2012 | Effective Date: July 1, 2013
Product Number: G05L45 | Price: $258.00

Spec 5L *
Specification for Line Pipe—Chinese

Chinese translation of Spec 5L.

45th Edition | December 2012
Product Number: G05L45C | Price: $181.00

Spec 5L *
Specification for Line Pipe—Portuguese

Portuguese translation of Spec 5L.

45th Edition | December 2012
Product Number: G05L45P | Price: $258.00

Spec 5L *
Specification for Line Pipe—Russian

Russian translation of Spec 5L.

45th Edition | December 2012
Product Number: G05L45R | Price: $207.00

Spec 5L *
Specification for Line Pipe—Spanish

Spanish translation of Spec 5L.

45th Edition | December 2012
Product Number: G05L45SP | Price: $258.00

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RP 5L1
Recommended Practice for Railroad Transportation of Line Pipe

Applies to the transportation on railcars of Spec 5L steel line pipe in sizes $2^3/_8$ 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: May 2015
Product Number: G5L107 | Price: $59.00

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

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

4th Edition | July 2002 | Reaffirmed: May 2015
Product Number: G5L204 | Price: $83.00

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

Chinese translation of RP 5L2.

4th Edition | July 2002 | Product Number: G5L204C | Price: $59.00

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

Kazakh translation of RP 5L2.

4th Edition | July 2002 | Product Number: G5L204K | Price: $67.00

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

Russian translation of RP 5L2.

4th Edition | July 2002 | Product Number: G5L204R | Price: $67.00

RP 5L3
Drop-Weight Tear Tests on Line Pipe

Describes procedures for a recommended method for conducting drop-weight tear tests to measure the fracture appearance or fracture ductility of line pipe as referenced in Spec 5L. Pages: 11

4th Edition | August 2014 | Product Number: G5l304 | Price: $95.00

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

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

2nd Edition | June 1988 | Reaffirmed: May 2015
Product Number: G02906 | Price: $89.00

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

Russian translation of RP 5L7.

2nd Edition | June 1988 | Product Number: G02906R | Price: $72.00

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

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

2nd Edition | December 1996 | Reaffirmed: May 2015
Product Number: G05L82 | Price: $125.00

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

Kazakh translation of RP 5L8.

2nd Edition | December 1996
Product Number: G05L82K | Price: $100.00

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

Russian translation of RP 5L8.

2nd Edition | December 1996
Product Number: G05L82R | Price: $100.00

RP 5L9 ◆
External Fusion Bonded Epoxy Coating of Line Pipe

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

1st Edition | December 2001 | Reaffirmed: May 2015
Product Number: G5L901 | Price: $79.00

RP 5L9 *
External Fusion Bonded Epoxy Coating of Line Pipe—Kazakh

Kazakh translation of RP 5L9.

1st Edition | December 2001 | Product Number: G5L901K | Price: $64.00

RP 5L9 *
External Fusion Bonded Epoxy Coating of Line Pipe—Russian

Russian translation of RP 5L9.

1st Edition | December 2001 | Product Number: G5L901R | Price: $64.00

Spec 5LC ◆
CRA Line Pipe
(includes Errata 1 dated October 2015)

Covers seamless, centrifugal cast, and welded corrosion resistant alloy line pipe as well as austenitic stainless, martensitic stainless, duplex stainless, and Ni-base alloys. Also includes standard weight, regular weight, special, extra strong, and double extra strong plain end line pipe as well as processes of manufacturer, chemical and physical requirements, and methods of testing. Pages: 110

4th Edition | March 2015 | Effective Date: September 3, 2015
Product Number: G5LC04 | Price: $175.00

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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: November 2012 | Product Number: G5LCP2 | Price: $146.00

Spec 5LCP *
Specification on Coiled Line Pipe—Chinese

Chinese translation of Spec 5LCP.

2nd Edition | October 2006 | Product Number: G5LCP2C | Price: $103.00

Spec 5LD ◆
CRA Clad or Lined Steel Pipe

Covers seamless, centrifugal cast, and welded clad steel line pipe, and lined steel pipe with improved corrosion-resistant properties. The clad and lined steel line pipe specified in this document shall be composed of a base metal outside and CRA layer inside the pipe. The base material shall conform to Spec 5L, except as modified in the 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
Product Number: G5LD04 | Price: $145.00

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 | Product Number: G5LT01 | Price: $59.00

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

Chinese translation of RP 5LT.

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

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: $59.00

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

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

1st Edition | January 2006 | Reaffirmed: September 2012
Product Number: G5SI01 | Price: $57.00

Spec 5ST ◆
Specification for Coiled Tubing—U.S. Customary and SI Units

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

1st Edition | April 2010 | Reaffirmed: May 2015
Product Number: G5ST01 | Price: $134.00

Spec 5ST *
Specification for Coiled Tubing—U.S. Customary and SI Units—Chinese

Chinese translation of Spec 5ST.

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

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

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

10th Edition | September 2003 | Reaffirmed: August 2010
Product Number: G05T10 | Price: $115.00

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

Provides alternative connection assembly procedures to those found in 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: $115.00

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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: $88.00

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

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

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

2nd Edition | June 2005 | Reaffirmed: May 2015
Product Number: G5UE02 | Price: $79.00

VALVES AND WELLHEAD EQUIPMENT

Spec 6A/ISO 10423:2009 ◆
Specification for Wellhead and Christmas Tree Equipment
(includes Errata 1 dated January 2011, Addendum 1 and Errata 2 dated November 2011, Addendum 2 dated November 2012, Addendum 3 dated March 2013, Errata 4 dated August 2013, Errata 5 dated November 2013, Errata 6 dated March 2014, Errata 7 dated December 2014, Errata 8 dated February 2016, Addendum 4 and Errata 9 dated June 2016, and Errata 10 dated August 2016)

Specifies requirements and gives recommendations for the performance, dimensional and functional interchangeability, design, materials, testing, inspection, welding, marking, handling, storing, shipment, purchasing, repair, and remanufacture of wellhead and christmas tree equipment for use in the petroleum and natural gas industries. This document does not apply to field use, field testing, or field repair of wellhead and christmas tree equipment. This document is applicable to the following specific equipment: wellhead equipment (casing head housings, casing head spools, tubing head spools, cross-over spools, multi-stage head housings and spools); connectors and fittings (cross-over connectors, tubing head adapters, top connectors, tees and crosses, fluid-sampling devices, adapter and spacer spools); casing and tubing hangers (mandrel hangers, slip hangers); valves and chokes (single valves, multiple valves, actuated valves, valves prepared for actuators, check valves, chokes, surface and underwater safety valves and actuators, back-pressure valves); loose connectors (weld neck connectors, blind connectors, threaded connectors, adapter and spacer connectors, bullplugs, valve-removal plugs); and other equipment (actuators, hubs, pressure boundary penetrations, ring gaskets, running and testing tools, wear bushings). This document defines service conditions, in terms of pressure, temperature, and material class for the well-bore constituents, and operating conditions. This International Standard establishes requirements for five product specification levels (PSL). These five PSL designations define different levels of technical quality requirements.

This edition of Spec 6A is the modified national adoption of ISO 10423:2009. Pages: 436

20th Edition | October 2010 | Effective Date: April 1, 2011
2-Year Extension: October 2012
Product Number: GX06A20 | Price: $260.00

Spec 6A/ISO 10423:2009 *
Specification for Wellhead and Christmas Tree Equipment—Chinese

Chinese translation of Spec 6A.

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

Std 6ACRA
Age-Hardened Nickel-Based Alloys for Oil and Gas Drilling and Production Equipment
(includes Errata 1 dated October 2015)

Provides requirements for age-hardened nickel-base alloys that are intended to supplement the existing requirements of Spec 6A. For downhole applications, refer to Spec 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 | $90.00

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

Presents the results of analysis work done in to establish the load capacity of all flanges give in the April 1986 editions of Spec 6A and Spec 6AB. A total of 69 different geometries were analyzed initially. The various loads considered were bolt makeup (preload), internal pressure, tension, and bending moment. All flanges were analyzed with an axisymmetric finite 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: $150.00

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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: $157.00

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

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

5th Edition | April 2013 | Product Number: G6AF25 | Price: $170.00

TR 6AM
Technical Report on Material Toughness

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

2nd Edition | September 1995 | Product Number: G06AM2 | Price: $76.00

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

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

Previous editions of this document included reference to and requirements for verification to PR1, standard service (Class I). Pages: 25

2nd Edition | February 2013 | Product Number: G6AV102 | Price: $80.00

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

Russian translation of Spec 6AV1.

2nd Edition | February 2013 | Product Number: G6AV102R | Price: $64.00

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

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

1st Edition | March 2014 | Product Number: G6AV201 | Price: $135.00

Spec 6D ◆
Specification for Pipeline and Piping Valves
(includes Errata 1 dated October 2014, Errata 2 dated December 2014, Errata 3 dated February 2015, Errata 4 dated June 2015, Errata 5 dated July 2015, Errata 6 dated September 2015, Addendum 1 dated March 2015, Addendum 2 and Errata 7 dated June 2016, and Errata 8 dated August 2016)

Specifies requirements and provides recommendations for the design, manufacturing, testing, and documentation of ball, check, gate, and plug valves for application in pipeline systems meeting ISO 13623 or similar requirements for the petroleum and natural gas industries. This specification is not applicable to subsea pipeline valves, as they are covered by a separate specification (Spec 6DSS). This specification is not for application to valves for pressure ratings exceeding PN 420 (Class 2500). Pages: 108

24th Edition | August 2014 | Effective Date: August 1, 2015
Product Number: G6D024 | Price: $150.00

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

Chinese translation of Spec 6D.

24th Edition | August 2014 | Product Number: G6D024C | Price: $105.00

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

Russian translation of Spec 6D.

24th Edition | August 2014 | Product Number: G6D024R | Price: $120.00

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

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 | Product Number: G06DR2 | Price: $78.00

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

Russian translation of Spec RP 6DR.

2nd Edition | May 2012 | Product Number: G06DR2R | Price: $63.00

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

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

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

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

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

Chinese translation of Spec 6DSS.

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

Std 6DX/ISO 12490:2011
Standard for Actuator Sizing and Mounting Kits for Pipeline Valves

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

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

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

TR 6F1
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: $115.00

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

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

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

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

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

3rd Edition | April 1999 | Reaffirmed: September 2011
2-Year Extension: July 2016 | Product Number: G06FA3 | Price: $97.00

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

Russian translation of Spec 6FA.

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

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

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

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

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

Spec 6FD
Specification for Fire Test for Check Valves

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

1st Edition | February 1995 | Reaffirmed: October 2013
Product Number: G06FD1 | Price: $89.00

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

Russian translation of Spec 6FD.

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

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

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

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

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

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

1st Edition | February 1992 | Product Number: G03230 | Price: $79.00

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: $79.00

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

Examines mechanical properties of metallic materials used for Spec 6A and Spec 17D wellhead equipment for service above 250 °F. A total of 11 different alloys meeting Spec 6A, PSL 3 conditions were supplied "in condition" by a variety of suppliers. Materials in this test program included alloys common to the oil and gas industry. The alloys tested included low alloy steels, martensitic, precipitation hardened and duplex stainless steels, and nickel alloys. Yield strength reduction ratios at temperatures of 300, 350, 400, and 450 °F are reported. As a result of testing, yield strength reduction ratios at 300 °F to 450 °F ranged from 92 % to 87 % for the low alloy steels, 92 % to 88 % for the martensitic stainless steels, 81 % to 73 % for super duplex, 99 % to 89 % for the precipitation hardened stainless steel, and 94 % to 89 % for the nickel alloys. The reported results represent an average over the different heats for each type of material. These results are intended to expand the data shown in Spec 6A, Appendix G. Pages: 32

1st Edition | October 2010 | Product Number: G6MET1 | Price: $98.00

Std 6X
Design Calculations for Pressure-Containing Equipment
(includes Errata 1 dated May 2014)

Describes the design analysis methodology used in the ASME *Boiler and Pressure Vessel Code*, 2004 with 2005 and 2006 addenda, Section VIII, Pressure Vessels, Division 2, Alternative Methods, Appendix 4. Methods are included for both elastic and elastic-plastic analysis, and for closed-form as well as finite-element analysis methods of calculation, in accordance with the rules of Appendix 4 of the 2004 *Code*, Section VIII Division 2. API has adopted slightly different stress limits from the 2004 ASME *Code*. The criteria used assume defect-free, tough, and ductile material behavior. Pages: 8

1st Edition | March 2014 | Product Number: G06X01 | Price: $60.00

DRILLING EQUIPMENT

Spec 7-1/ISO 10424-1:2004 ◆
Specification for Rotary Drill Stem Elements
(includes Addendum 1 dated March 2007, Addendum 2 dated August 2009, and Addendum 3 dated April 2011)

Replaces, in part, Spec 7, 40th Edition. Spec 7, Addendum 2 removes the following products now covered by this standard.

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

Tool joints, rotary shouldered connections, and gauging will remain in Spec 7 until they are moved into ISO documents in the future. This edition of Spec 7-1 is the identical national adoption of ISO 10424-1:2004. Pages: 87

1st Edition | February 2006 | Effective Date: September 1, 2006
Reaffirmed: April 2015 | Product Number: GX7101 | Price: $162.00

Spec 7-1/ISO 10424-1:2004 *
Specification for Rotary Drill Stem Elements—Chinese

Chinese translation of Spec 7-1.

1st Edition | February 2006 | Product Number: GX7101C | Price: $114.00

Spec 7-1/ISO 10424-1:2004 *
Specification for Rotary Drill Stem Elements—Spanish

Spanish translation of Spec 7-1.

1st Edition | February 2006 | Product Number: GX7101SP | Price: $162.00

Spec 7-2 ◆■
Threading and Gauging of Rotary Shouldered Connections

Specifies requirements on rotary shouldered connections for use in petroleum and natural gas industries, including dimensional requirements on threads and thread gauges, stipulations on gauging practice 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: 124

2nd Edition | January 2017 | Product Number: GX70202 | Price: $190.00

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Std 7CW
Casing Wear Tests

Provides a method by which results will be reproducible, under a specified set of conditions, for conducting tests that determine casing wear due to rotation of drill stem elements.

This standard is intended to be used in a laboratory environment and is not intended for use in the field during operations. The testing requirements in this standard are not represented at well conditions. This standard is divided into four major areas: machine apparatus, procedures, materials, and reporting.

This standard will not address the significance of specific data values. It is the responsibility of the user of this standard to establish the appropriate test data values that are acceptable based on their respective application, operational limitations, and safety practices. Pages: 18

1st Edition | June 2015 | Product Number: G7CW01 | Price: $85.00

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

Covers the manufacture of the components for, and the assembly and packaging of, single and multiple strand, numbers 40 through 240, standard and heavy series roller chains for oil field applications, including chain designation, chain length tolerance, tensile strength specifications, pin and bushing press-out specifications, and dynamic test requirements. For informational purposes, Annex A provides recommendations for installation, lubrication, and maintenance of oil field chain drives, and Annex B includes a basic description of roller chain sprockets. Pages: 29

8th Edition | November 2010 | Effective Date: May 1, 2011
Reaffirmed: April 2016 | Product Number: G7F008 | Price: $116.00

Spec 7F *
Oil Field Chain and Sprockets—Chinese

Chinese translation of Spec 7F.

8th Edition | November 2010 | Product Number: G7F008C | Price: $82.00

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

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

16th Edition | August 1998 | Effective Date: December 1, 1998
Reaffirmed: May 2015 | Product Number: G07G6A | Price: $194.00

RP 7G *
Recommended Practice for Drill Stem Design and Operating Limits—Kazakh

Kazakh translation of RP 7G.

16th Edition | August 1998 | Product Number: G07G6AK | Price: $156.00

RP 7G *
Recommended Practice for Drill Stem Design and Operating Limits—Russian

Russian translation of RP 7G.

16th Edition | September 2009
Product Number: G07G6AR | Price: $155.00

RP 7G-2/ISO 10407-2:2008
Recommended Practice for Inspection and Classification of Drill Stem Element Inspection
(includes Errata 1 dated October 2009)

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

This edition of RP 7G-2 is the identical national adoption of ISO 10407-2:2008. Pages: 213

1st Edition | August 2009 | Reaffirmed: April 2015
Product Number: GX7G201 | Price: $140.00

RP 7G-2/ISO 10407-2:2008 *
Recommended Practice for Inspection and Classification of Drill Stem Element Inspection—Spanish

Spanish translation of RP 7G-2.

1st Edition | August 2009 | Product Number: GX7G201SP | Price: $140.00

RP 7HU1
Safe Use of 2-Inch Hammer Unions for Oilfield Applications
(includes Errata 1 dated February 2014)

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

1st Edition | May 2009 | Reaffirmed: April 2014
Product Number: H7HU11 | Price: $37.00

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

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

- rotary tables;
- rotary bushings;
- high-pressure mud and cement hoses;
- piston mud-pump components;
- drawworks components;
- manual tongs;
- safety clamps not used as hoisting devices;
- blowout preventer (BOP) handling systems;
- pressure-relieving devices for high-pressure drilling fluid circulating systems;
- snub-lines for manual and power tongs;
- rotary slips, both manual and powered;
- slip bowls; and
- spiders, both manual and powered. Pages: 130

6th Edition | December 2015 | Product Number: G07K06 | Price: $200.00

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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 2012 | 2-Year Extension: July 2016
Product Number: G07L01 | Price: $109.00

Spec 7NRV ◆
Specification for Drill String Non-Return Valves

Provides the minimum acceptable requirements for drill string non-return valve (NRV) equipment. It covers drill string non-return valves, non-return valve subs, non-return valve landing nipples, non-return valve equalizing heads, and all components that establish tolerances and/or clearances that may affect performance or interchangeability of the NRV equipment. Non-return valve subs, non-return valve landing nipples, non-return valve equalizing heads, and NRVs manufactured by different facilities or manufacturers may be supplied as separate items. Pages: 19

1st Edition | July 2006 | Reaffirmed: December 2012
Product Number: G7NRV01 | Price: $70.00

Spec 7NRV *
Specification for Drill String Non-Return Valves—Chinese

Chinese translation of Spec 7NRV.

1st Edition | July 2006 | Product Number: G7NRV01C | Price: $49.00

HOISTING TOOLS

RP 8B
Recommended Practice for Procedures for Inspection, Maintenance, Repair, and Remanufacture of Hoisting Equipment

Provides guidelines and establishes requirements for inspection, maintenance, repair, and remanufacture of items of hoisting equipment manufactured according to Spec 8A, Spec 8C, or ISO 13535 used in drilling and production operations, in order to maintain the serviceability of this equipment. Items of drilling and production hoisting equipment covered are:

- crown-block sheaves and bearings;
- traveling blocks and hook blocks;
- block-to-hook adapters;
- connectors and link adapters;
- drilling hooks;
- tubing hooks and sucker-rod hooks;
- elevator links;
- casing elevators, tubing elevators, drill-pipe elevators, and drill-collar elevators;
- sucker-rod elevators;
- 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: $95.00

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

Provides requirements for the design, manufacture, and testing of hoisting equipment suitable for use in drilling and production operations. This specification is applicable to numerous drilling and production hoisting equipment, some of which include: hoisting sheaves, traveling and hook blocks; elevator links, casing elevators, sucker rod elevators, rotary and power swivels, drilling hooks, wireline anchors, drill string motion compensators, and safety clamps. Pages: 53

5th Edition | April 2012 | Effective Date: October 1, 2012
Product Number: GX08C05 | Price: $140.00

Spec 8C *
Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)—Chinese

Chinese translation of Spec 8C.

5th Edition | April 2012 | Product Number: GX08C05C | Price: $98.00

WIRE ROPE

Spec 9A ◆
Specification for Wire Rope
(includes Errata 1 dated October 2012 and Addendum 1 dated November 2016)

Specifies the minimum requirements and terms of acceptance for the manufacture and testing of steel wire ropes not exceeding rope grade 2160 for the petroleum and natural gas industries. The following products are covered by this specification:

- wire rope,
- bright- or drawn-galvanized wire rope,
- well-measuring wire, and
- well-measuring strand.

Typical applications include tubing lines, rod hanger lines, sand lines, cable-tool drilling and clean out lines, cable tool casing lines, rotary drilling lines, winch lines, horse head pumping unit lines, torpedo lines, mast raising lines, guideline tensioner lines, riser tensioner lines, and mooring and anchor lines. Ropes for lifting slings and cranes, and wire for well-measuring and 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

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

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

Spec 9A *
Specification for Wire Rope—Chinese

Chinese translation of Spec 9A.

26th Edition | May 2011 | Product Number: G9A026C | Price: $77.00

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

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

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

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

OIL WELL CEMENTS

Spec 10A/ISO 10426-1:2009 ◆
Specification for Cements and Materials for Well Cementing

Specifies requirements and gives recommendations for six classes of well cements, including their chemical and physical requirements and procedures for physical testing. This specification is applicable to well cement classes A, B, C, and D, which are the products obtained by grinding Portland cement clinker and, if needed, calcium sulfate as an interground additive. Processing additives can be used in the manufacture of cement of these classes. Suitable set-modifying agents can be interground or blended during manufacture of class D cement. This specification is also applicable to well cement classes G and H, which are the products obtained by grinding clinker with no additives other than one or more forms of calcium sulfate, water or chemical additives as required for chromium (VI) reduction.

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

24th Edition | December 2010 | Reaffirmed: April 2015
Product Number: GX10A24 | Price: $145.00

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

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

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

RP 10B-3
Testing of Well Cements Used in Deepwater Well Construction

Provides procedures for testing well cement slurries and cement blends for use in a deepwater environment or wells drilled in areas with a low seafloor temperature or areas where low well temperatures exist. For the purposes of this document the term “deepwater” includes areas where low seafloor temperatures exist, independent of water depth.

The procedures contained in this document serve as guidance for the testing of well cement slurries used in deepwater well construction. Additionally, testing methods contained in this document (most notably at mudline conditions) may also be used in those circumstances where low seafloor temperatures are found at shallow water depths. These conditions are found in areas including the North Sea, Norwegian Sea, Barents Sea, Kara Sea, Beaufort Sea, Chukchi Sea, Caspian Sea, and Black Sea.

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

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

RP 10B-4
Preparation and Testing of Foamed Cement Formulations at Atmospheric Pressure

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

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

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

RP 10B-5/ISO 10426-5:2004
Recommended Practice on Determination of Shrinkage and Expansion of Well Cement Formulations at Atmospheric Pressure

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

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

1st Edition | April 2005 | Reaffirmed: April 2015
Product Number: GX10B501 | Price: $80.00

RP 10B-6/ISO 10426-6:2008
Recommended Practice on Determining the Static Gel Strength of Cement Formulations

This document specifies requirements and provides test methods for the determination of static gel strength (SGS) of the cement slurries and related materials under simulated well conditions.

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

1st Edition | August 2010 | Reaffirmed: April 2015
Product Number: GG10B601 | Price: $62.00

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

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

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

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

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

Chinese translation of Spec 10D.

6th Edition | March 2002 | Product Number: GX10D06C | Price: $63.00

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

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

This edition of RP 10D-2 is the identical national adoption of ISO 10427-2:2004. Pages: 14

1st Edition | August 2004 | Reaffirmed: April 2015
Product Number: GG10D21 | Price: $77.00

RP 10F/ISO 10427-3:2003
Recommended Practice for Performance Testing of Cementing Float Equipment
(includes Errata 1 dated September 2003)

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

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

3rd Edition | April 2002 | Reaffirmed: April 2015
Product Number: GX10F03 | Price: $64.00

TR 10TR1
Cement Sheath Evaluation

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

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

TR 10TR1 *
Cement Sheath Evaluation—Kazakh

Kazakh translation of TR 10TR1.

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

TR 10TR1 *
Cement Sheath Evaluation—Russian

Russian translation of TR 10TR1.

2nd Edition | September 2008
Product Number: G10TR12R | Price: $116.00

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: $122.00

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

Russian translation of TR 10TR2.

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

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

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

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

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

Russian translation of TR 10TR3.

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

TR 10TR4
Selection of Centralizers for Primary Cementing Operations

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

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

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

Kazakh translation of TR 10TR4.

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

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

Russian translation of TR 10TR4.

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

TR 10TR5
Methods for Testing of Solid and Rigid Centralizers

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

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

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

Kazakh translation of TR 10TR5.

1st Edition | May 2008 | Product Number: G10TR50K | Price: $49.00

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

Russian translation of TR 10TR5.

1st Edition | May 2008 | Product Number: G10TR50R | Price: $48.00

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: $90.00

RP 65
Cementing Shallow Water Flow Zones in Deepwater Wells
(includes Errata 1 dated August 2003)

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

1st Edition | September 2002 | Reaffirmed: January 2012
Product Number: G56001 | Price: $121.00

RP 65 *
Cementing Shallow Water Flow Zones in Deepwater Wells—Kazakh

Kazakh translation of RP 65.

1st Edition | September 2002 | Product Number: G56001K | Price: $97.00

RP 65 *
Cementing Shallow Water Flow Zones in Deepwater Wells—Russian

Russian translation of RP 65.

1st Edition | September 2002 | Product Number: G56001R | Price: $96.00

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

PRODUCTION EQUIPMENT

RP 11AR
Recommended Practice for Care and Use of Subsurface Pumps
(includes Errata dated December 2013)

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

4th Edition | June 2000 | Reaffirmed: January 2014
Product Number: G11AR4 | Price: $124.00

Spec 11AX ◆
Specification for Subsurface Sucker Rod Pump Assemblies, Components, and Fittings

Provides the requirements and guidelines for the design of subsurface sucker rod pumps and their components as defined herein for use in the sucker rod lift method for the petroleum and natural gas industry.

The specification covers subsurface sucker rod pump assemblies (including insert and tubing), components, and fittings in commonly used bore sizes for the sucker rod lift method. Sufficient dimensional and material requirements are provided to assure interchangeability and standardization of all component parts.

The specification does not cover specialty subsurface sucker rod pump accessories or special design components. Also, installation, operation, and maintenance of these products are not included in this specification; however, recommendations can be found in RP 11AR. Pages: 107

13th Edition | May 2015 | Effective Date: November 4, 2015
Product Number: G11AX13 | Price: $175.00

Spec 11B ◆
Specification for Sucker Rods, Polished Rods and Liners, Couplings, Sinker Bars, Polished Rod Clamps, Stuffing Boxes, and Pumping Tees
(includes Errata 1 dated October 2010 and Errata 2 dated February 2011)

Provides the requirements and guidelines for the design and rating of steel sucker rods and pony rods, polished rods, polished rod liners, couplings and sub-couplings, fiber reinforced plastic (FRP) sucker rods, sinker bars, polished rod clamps, stuffing boxes, and pumping tees as defined herein for use in the sucker rod lift method for the petroleum and natural gas industry. Annexes A through H provide the requirements for specific products. Annex I includes the requirements for thread gauges, Annex J illustrates the components of a sucker rod lift system, and Annex K shows examples of sucker rod discontinuities. This specification does not cover sucker rod guides, sucker rod rotators, shear tools, on-off tools, stabilizer bars, sealing elements used in stuffing boxes, or interface connections for stuffing boxes and pumping tees. Also, installation, operation, and maintenance of these products are not included in this specification. Pages: 91

27th Edition | May 2010 | Effective Date: November 1, 2010
2-Year Extension: February 2015
Product Number: G11B27 | Price: $155.00

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

Chinese translation of Spec 11B.

27th Edition | May 2010 | Product Number: G11B27C | Price: $109.00

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: April 2015
Product Number: G11BR09 | Price: $105.00

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

Chinese translation of RP 11BR.

9th Edition | August 2008 | Product Number: G11BR09C | Price: $74.00

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

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

This edition of Std 11D3 is the identical national adoption of ISO 15136-2:2006. Pages: 99

1st Edition | June 2008 | Reaffirmed: March 2015
Product Number: G11D301 | Price: $106.00

Spec 11E ◆
Specification for Pumping Units
(includes Errata 1 dated August 2015)

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 speed reducer input shaft. This includes the beam pump structure, the pumping unit gear reducer, and the pumping unit chain reducer. Only loads imposed on the structure and/or gear reducer by the polished rod load are considered in this specification. Also included are the requirements for the design and rating of enclosed speed reducers wherein the involute gear tooth designs include helical and herringbone gearing. The rating methods and influences identified in this specification are limited to single and multiple stage designs applied to beam pumping units in which the pitch-line velocity of any stage does not exceed 5,000 ft/min and the speed of any shaft does not exceed 3,600 r/min. This standard does not cover chemical properties of materials, installation and maintenance of the equipment, beam type counterbalance units, prime movers and power transmission devices outside the gear reducer, or control systems. Pages: 104

19th Edition | November 2013 | Effective Date: May 1, 2014
Product Number: G11E019 | Price: $170.00

Spec 11E *
Specification for Pumping Units—Chinese

Chinese translation of Spec 11E.

19th Edition | November 2013
Product Number: G11E019C | Price: $119.00

RP 11ER
Recommended Practice for Guarding of Pumping Units

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

3rd Edition | November 2009 | Reaffirmed: March 2015
Product Number: G11ER03 | Price: $80.00

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

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

5th Edition | November 2013 | Product Number: G11G05 | Price: $85.00

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

Covers recommendations for design calculations for conventional unit sucker rod pumping systems based on test data submitted to API by Sucker Rod Pumping Research, Inc. The topics include vibration characteristics of sucker rod strings, physical characteristics of sucker rods, and dimensional analysis of sucker rod pumping systems. The calculations apply to the broad category of 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: $106.00

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: $122.00

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

Contains print-out tables of computer calculated values for selecting sucker rod systems. Values are included for depths of 200 ft to 12,000 ft in increments of 500 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: $132.00

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

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

2nd Edition | May 2008 | Product Number: G11L602 | Price: $86.00

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

Chinese translation of TR 11L6.

2nd Edition | May 2008 | Product Number: G11L602C | Price: $61.00

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

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

3rd Edition | November 1994 | Reaffirmed: October 2013
Product Number: G11S03 | Price: $83.00

RP 11S1
Recommended Practice for Electrical Submersible Pump Teardown Report

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

3rd Edition | September 1997 | Effective Date: December 15, 1997
Reaffirmed: October 2013 | Product Number: G11S13 | Price: $122.00

RP 11S2
Recommended Practice for Electric Submersible Pump Testing

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

2nd Edition | August 1997 | Effective Date: October 1, 1997
Reaffirmed: October 2013 | Product Number: G11S22 | Price: $83.00

RP 11S2 *
Recommended Practice for Electric Submersible Pump Testing—Russian

Russian translation of RP 11S2.

2nd Edition | August 1997 | Product Number: G11S22R | Price: $67.00

RP 11S3
Recommended Practice for Electrical Submersible Pump Installations

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

2nd Edition | March 1999 | Reaffirmed: October 2013
Product Number: G11S32 | Price: $89.00

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

Russian translation of RP 11S3.

2nd Edition | March 1999 | Product Number: G11S32R | Price: $72.00

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

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

3rd Edition | July 2002 | Reaffirmed: October 2013
Product Number: G11S43 | Price: $79.00

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

Covers the application (size and configuration) of electrical submersible cable systems by manufacturers, vendors, or users. The document addresses the varies uses of different cable insulation systems, including jackets, braids, armor, and related coverings, as well as auxiliary cable components for cable conductors. The document also addresses splicing and terminating cables including splicing, lengthening, and repairs. Pages: 38

2nd Edition | April 2008 | Reaffirmed: October 2013
Product Number: G11S52 | Price: $109.00

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

Covers field testing of electric submersible pump cable systems. This document is organized into three major topic categories. The first category provides general definitions and an overview of terms, safety considerations, and cable system preparation guidelines. The second category identifies various situations under which testing is performed. The third category identifies test methods and procedures. Pages: 18

1st Edition | December 1995 | Reaffirmed: October 2013
Product Number: G11S61 | Price: $89.00

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

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

1st Edition | July 1993 | Reaffirmed: October 2013
Product Number: G05947 | Price: $89.00

RP 11S8
Recommended Practice on Electric Submersible System Vibrations

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

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

LEASE PRODUCTION VESSELS

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

Covers material, design, fabrication, and testing requirements for vertical, cylindrical, aboveground, closed and open top, bolted steel storage tanks in various standard sizes and capacities for internal pressures approximately atmospheric. This specification is designed to provide the oil production industry with safe and economical bolted tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. This specification is for the convenience of purchasers and manufacturers in ordering and fabricating tanks. Pages: 31

16th Edition | November 2014
Product Number: G12B156 | Price: $120.00

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

Covers material, design, fabrication, and testing requirements for vertical, cylindrical, aboveground, closed top, welded steel storage tanks with internal pressures approximately atmospheric at various sizes and capacities ranging from 500 to 10,000 barrels. Tanks covered by this specification have been designed using established engineering calculations to determine minimum metal thickness and bolting specifications for each size tank filled with water. This specification is designed to provide the oil production industry with tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. Pages: 27

11th Edition | October 2008 | Effective Date: April 1, 2009
2-Year Extension: November 2015
Product Number: G12D11 | Price: $97.00

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

Chinese translation of Spec 12D.

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

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

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

12th Edition | October 2008 | Effective Date: April 1, 2009
2-Year Extension: November 2015
Product Number: G12F12 | Price: $97.00

Spec 12F *
Specification for Shop Welded Tanks for Storage of Production Liquids—Chinese

Chinese translation of Spec 12F.

12th Edition | October 2008 | Product Number: G12F12C | Price: $68.00

Spec 12J ◆
Specification for Oil and Gas Separators

Covers minimum requirements for the design, fabrication, and plant testing of oil and gas separators and oil-gas-water separators that are used in the production of oil and gas and are located at some point on the producing flow line between the wellhead and pipeline. Separators covered by this specification may be vertical, spherical, or single or double barrel horizontal. Unless otherwise agreed upon between the purchaser and the manufacturer, the jurisdiction of this specification terminates with the pressure vessel as defined in Section VII, Division 1 of the ASME *Boiler and Pressure Vessel Code*. Pressure vessels covered by this specification are normally classified as natural resource vessels. Separators outside the scope of this specification include centrifugal separators, filter separators, and desanding separators. Pages: 25

8th Edition | October 2008 | Effective Date: April 1, 2009
Product Number: G12J08 | Price: $97.00

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

Chinese translation of Spec 12J.

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

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

Russian translation of Spec 12J.

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

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Spec 12K ◆
Specification for Indirect Type Oilfield Heaters

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

8th Edition | October 2008 | Effective Date: April 1, 2009
Product Number: G12K08 | Price: $115.00

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

Chinese translation of Spec 12K.

8th Edition | October 2008 | Product Number: G12K08C | Price: $81.00

Spec 12L ◆
Specification for Vertical and Horizontal Emulsion Treaters

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

5th Edition | October 2008 | Effective Date: April 1, 2009
Product Number: G12L05 | Price: $97.00

RP 12N
Recommended Practice for the Operation, Maintenance and Testing of Firebox Flame Arrestors

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

2nd Edition | November 1994 | Reaffirmed: April 2008
Product Number: G12N02 | Price: $83.00

Spec 12P ◆■
Specification for Fiberglass Reinforced Plastic Tanks

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

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

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

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

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

For use as a guide for new tank installations and maintenance of existing tanks, Spec. 12R1 contains recommendations for good practices in the collection of well or lease production; gauging; delivery to pipeline carriers for transportation; and other production storage and treatment operations. This recommended practice is intended primarily for application to tanks fabricated to Specs 12F, 12D, 12F, and 12P when employed in on-land production service, but its basic principles are applicable to atmospheric tanks of other dimensions and specifications when they are employed in similar oil and gas production, treating, and processing services. It is not applicable to refineries, petrochemical plants, marketing bulk stations, or pipeline storage facilities operated by carriers. Pages: 49

5th Edition | August 1997 | Reaffirmed: April 2008
2-Year Extension: November 2015 | Product Number: G12R15
Price: $132.00

DRILLING FLUID MATERIALS

Spec 13A/ISO 13500:2009 ◆
Specification for Drilling Fluid Materials
(includes Errata 1 dated August 2014, Errata 2 dated May 2015, Errata 3 dated July 2015, and Errata 4 dated October 2016)

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

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

18th Edition | February 2010 | Reaffirmed: July 2015
Effective Date: August 1, 2010
Product Number: GX13A018 | Price: $181.00

Spec 13A/ISO 13500:2009 *
Specification for Drilling Fluid Materials—Chinese

Chinese translation of Spec 13A.

18th Edition | February 2010
Product Number: GX13A018C | Price: $127.00

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RP 13B-1/ISO 10414-1:2008
Recommended Practice for Field Testing Water-Based Drilling Fluids (includes Errata 1 dated August 2014)

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

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

Annexes A through K provide additional test methods.

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

4th Edition | March 2009 | Reaffirmed: March 2016
Product Number: GX13B14 | Price: $165.00

RP 13B-2
Recommended Practice for Field Testing Oil-Based Drilling Fluids (includes Errata 1 dated August 2014)

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

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

The annexes provide additional test methods or examples that can optionally be used for the determination of:

- shear strength (Annex A);
- oil and water concentrations from cuttings (Annex B);
- drilling fluid activity (Annex C);
- aniline point (Annex D);
- lime, salinity, and solids concentration (Annex E);
- sampling, inspection, and rejection (Annex F);
- rig-site sampling (Annex G);
- cuttings activity (Annex H);
- active sulfide (Annex I);
- calibration and verification of glassware, thermometers, viscometers, retort kit cups, and drilling fluid balances (Annex J);
- high-temperature/high-pressure filtration using the permeability-plugging apparatus (PPA) (Annex K);
- elastomer compatibility (Annex L);
- sand content of oil-based fluid (Annex M);
- identification and monitoring of weight-material sag (Annex N);
- oil-based drilling fluid test report form (Annex O). Pages: 141

5th Edition | April 2014 | Product Number: G13B205 | Price: $205.00

RP 13C
Recommended Practice on Drilling Fluid Processing Systems Evaluation

Specifies a standard procedure for assessing and modifying the performance of solids control equipment systems commonly used in the field in petroleum and natural gas drilling fluids processing. The procedure described in this standard is not intended for the comparison of similar types of individual pieces of equipment. Pages: 60

5th Edition | October 2014 | Product Number: G13C05 | Price: $135.00

RP 13D
Rheology and Hydraulics of Oil-Well Fluids

Provides a basic understanding of and guidance about drilling fluid rheology and hydraulics, and their application to drilling operations. For this RP, rheology is the study of flow characteristics of a drilling fluid and how these characteristics affect movement of the fluid. Specific measurements are made on a fluid to determine rheological parameters under a variety of conditions. From this information the circulating system can be designed or evaluated regarding how it will accomplish certain desired objectives. Pages: 79

6th Edition | May 2010 | 2-Year Extension: June 2015
Product Number: G13D06 | Price: $134.00

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

Kazakh translation of RP 13D.

6th Edition | May 2010 | Product Number: G13D06K | Price: $108.00

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

Russian translation of RP 13D.

6th Edition | May 2010 | Product Number: G13D06R | Price: $108.00

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

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

This edition of RP 13I is the identical national adoption of ISO 10416:2008. Pages: 108

8th Edition | March 2009 | Reaffirmed: March 2016
Product Number: GX13I8 | Price: $186.00

RP 13J
Testing of Heavy Brines

Covers the physical properties, potential contaminants, and test procedures for heavy brine fluids manufactured for use in oil and gas well drilling, completion, fracturing, and workover fluids. RP 13J provides methods for assessing the performance and physical characteristics of heavy brines for use in field operations. It includes procedures for evaluating the density or specific gravity, the clarity or amount of particulate matter carried in the brines, the crystallization point or the temperature (both ambient and under pressure) at which the brines make the transition between liquid and solid, the pH, and iron contamination. It also contains a discussion of gas hydrate formation and mitigation, brine viscosity, corrosion testing, buffering capacity, and a standardized reporting form. RP 13J is intended for the use of manufacturers, service companies, and end users of heavy brines. Pages: 76

5th Edition | October 2014 | Product Number: G13J05 | Price: $130.00

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RP 13K
Recommended Practice for Chemical Analysis of Barite

Barite is used to increase the density of oil well drilling fluids. It is a mined product that can contain significant quantities of minerals other than its main component, barium sulfate. It is the objective of this publication to provide a comprehensive, detailed description of the chemical analytical procedures for quantitatively determining the mineral and chemical constituents of barite. These procedures are quite elaborate and will normally be carried out in a well-equipped laboratory. Pages: 51

3rd Edition | May 2011 | Reaffirmed: May 2016
Product Number: G13K03 | Price: $107.00

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

Kazakh translation of RP 13K.

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

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

Russian translation of RP 13K.

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

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

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

1st Edition | February 2003 | Reaffirmed: October 2010
2-Year Extension: June 2015 | Product Number: G13L01 | Price: $53.00

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

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

This edition of RP 13M is the identical national adoption of ISO 13503-1:2003. Pages: 21

1st Edition | July 2004 | Reaffirmed: October 2010
2-Year Extension: June 2015 | Product Number: GX13M01 | Price: $98.00

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: $57.00

OFFSHORE SAFETY AND ANTIPOLLUTION

Spec 14A ◆
Specification for Subsurface Safety Valve Equipment
(includes Errata 1 dated July 2015)

Provides the requirements for subsurface safety valves (SSSVs), 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 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: 140

12th Edition | January 2015 | Effective Date: January 15, 2016
Product Number: G14A12 | Price: $225.00

RP 14B
Design, Installation, Operation, Test, and Redress of Subsurface Safety Valve Systems

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: $126.00

RP 14C
Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms

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

7th Edition | March 2001 | Reaffirmed: March 2007
Product Number: G14C07 | Price: $201.00

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: January 2013
Product Number: G07185 | Price: $149.00

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

Chinese translation of RP 14E.

5th Edition | October 1991
Product Number: 811-07185 CN940 | Price: $105.00

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

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 recommended practice (RP) is not applicable to Mobile Offshore Drilling Units (MODUs) without production facilities. This document is intended to bring together in one place a brief description of basic desirable electrical practices for offshore electrical systems. The recommended practices contained herein recognize that special electrical considerations exist for offshore petroleum facilities. Pages: 150

5th Edition | July 2008 | Reaffirmed: April 2013
Product Number: G14F05 | Price: $119.00

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

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 | Product Number: G14FZ02 | Price: $280.00

RP 14G
Recommended Practice for Fire Prevention and Control on Fixed Open-Type Offshore Production Platforms

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

4th Edition | April 2007 | Reaffirmed: January 2013
Product Number: G14G04 | Price: $124.00

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

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

2nd Edition | May 2001 | Reaffirmed: January 2013
Product Number: G14J02 | Price: $117.00

Spec 14L/ISO 16070:2005 ◆
Specification for Lock Mandrels and Landing Nipples

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

This edition of Spec 14L is the identical national adoption of ISO 16070:2005. Pages: 25

2nd Edition | July 2007 | Reaffirmed: August 2012
Product Number: GG14L02 | Price: $119.00

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

Chinese translation of Spec 14L.

2nd Edition | July 2007 | Product Number: GX14L02C | Price: $84.00

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

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

1st Edition | June 2007 | Product Number: G09101 | Price: $61.00

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FIBERGLASS AND PLASTIC PIPE

RP 15CLT
Recommended Practice for Composite Lined Steel Tubular Goods

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

1st Edition | September 2007 | Reaffirmed: October 2013
Product Number: G15CLT1 | Price: $83.00

Spec 15HR ◆■
High-Pressure Fiberglass Line Pipe
(includes Errata 1 dated August 2016)

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
Product Number: G15HR4 | Price: $110.00

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

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

4th Edition | January 2008 | Effective Date: July 1, 2008
Reaffirmed: October 2013 | Product Number: G15LE4 | Price: $101.00

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

Chinese translation of Spec 15LE.

4th Edition | January 2008 | Product Number: G15LE4C | Price: $71.00

Spec 15LR ◆
Specification for Low Pressure Fiberglass Line Pipe

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

7th Edition | August 2001 | Effective Date: February 1, 2002
Reaffirmed: October 2013 | Product Number: G15LR7 | Price: $97.00

Spec 15LR *
Specification for Low Pressure Fiberglass Line Pipe—Chinese

Chinese translation of Spec 15LR.

7th Edition | August 2001 | Product Number: G15LR7C | Price: $68.00

Spec 15S ■
Spoolable Reinforced Plastic Line Pipe
(includes Errata 1 dated July 2016)

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. These products consist of a liner with helically wrapped steel or nonmetallic reinforcing elements and an outer cover. The helical reinforcing elements shall be a single material. Additional nonhelical reinforcing elements are acceptable. The spoolable reinforced line pipe under this specification is capable of being spooled for storage, transport, and installation. For offshore use, additional requirements may apply and are not within the scope of this document. This specification is confined to pipe, end-fittings, and couplings and does not relate to other system components and appurtenances. Where other system components (e.g. elbows, tees, valves) are of conventional construction, they will be governed by other applicable codes and practices. Pages: 62

2nd Edition | March 2016 | Effective Date: September 1, 2016
Product Number: G15S02 | Price: $125.00

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

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

2nd Edition | March 1999 | Reaffirmed: October 2013
Product Number: G15TL4 | Price: $97.00

DRILLING WELL CONTROL SYSTEMS

Spec 16A/ISO 13533:2001 ◆
Specification for Drill-Through Equipment
(includes Supplement/Errata 1 dated November 2004)

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

- ram blowout preventers;

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

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

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

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

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

Chinese translation of Spec 16A.

3rd Edition | June 2004 | Product Number: GX16A03C | Price: $116.00

Spec 16C ◆
Choke and Kill Equipment
(includes Errata 1 dated July 2015, Errata 2 dated November 2015, Errata 3 dated February 2016, and Addendum 1 and Errata 4 dated July 2016)

Establishes the minimum requirements for the design and manufacture of following types of new equipment:

- articulated choke and kill lines;
- choke and kill manifold buffer chamber;
- choke and kill manifold assembly;
- drilling choke actuators;
- drilling choke controls;
- drilling chokes;
- flexible choke and kill lines;
- union connections used in choke and kill assemblies;
- rigid choke and kill lines;
- swivel unions used in choke and kill equipment.

These requirements were formulated to provide for safe and functionally interchangeable surface and subsea choke and kill system equipment utilized for drilling oil and gas wells.

Technical content provides the minimum requirements for performance, design, materials, welding, testing, inspection, storing, and shipping. Pages: 114

2nd Edition | March 2015 | Product Number: G16C02 | Price: $150.00

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

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

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

2nd Edition | July 2004 | Effective Date: January 1, 2005
Reaffirmed: August 2013 | Under Revision
Product Number: G16D02 | Price: $177.00

Spec 16D *
Specification for Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment—Chinese

Chinese translation of Spec 16D.

2nd Edition | July 2004 | Product Number: G16D02C | Price: $124.00

Spec 16D *
Specification for Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment—Kazakh

Kazakh translation of Spec 16D.

2nd Edition | July 2004 | Product Number: G16D02K | Price: $142.00

Spec 16D *
Specification for Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment—Russian

Russian translation of Spec 16D.

2nd Edition | July 2004 | Product Number: G16D02R | Price: $141.00

Spec 16F ◆
Specification for Marine Drilling Riser Equipment
(includes Addendum 1 dated September 2014)

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

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

1st Edition | August 2004 | Effective Date: February 1, 2005
Reaffirmed: August 2010 | 2-Year Extension: June 2015
Product Number: G16F01 | Price: $119.00

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

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: 48

1st Edition | November 1993 | Reaffirmed: August 2010
2-Year Extension: June 2015 | Product Number: G07249 | Price: $109.00

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

Covers the design, rating, manufacturing, and testing of marine drilling riser couplings. Coupling capacity ratings are established to enable the grouping of coupling models according to their maximum stresses developed under specific levels of loading, regardless of manufacturer or method of make-up. This specification relates directly to RP 16Q, which covers the design, selection, and operation of the marine drilling riser system as a whole. Pages: 18

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

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

Chinese translation of Spec 16R.

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

Spec 16RCD ◆
Specification for Rotating Control Devices

Formulated to provide for the availability of safe and functionally interchangeable rotating control devices (RCDs) utilized in air drilling, drilling operations for oil and gas, and geothermal drilling operations.

Technical content provides requirements for design, performance, materials, tests and inspection, welding, marking, handling, storing, and shipping. This specification does not apply to field use or fieldtesting of RCDs.

Critical components are those parts having requirements specified in this document. Pages: 52

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

RP 16ST
Coiled Tubing Well Control Equipment Systems

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

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

1st Edition | March 2009 | Reaffirmed: December 2014
Product Number: G16ST01 | Price: $145.00

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

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

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

The primary functions of these systems are to confine well fluids to the wellbore, provide means to add fluid to the wellbore, and allow controlled volumes to be withdrawn from the wellbore. Diverter and rotating head systems (rotating control devices) are not addressed in this standard (see RP 64 and Spec 16RCD, respectively); their primary purpose is to safely divert or direct flow rather than to confine fluids to the wellbore. Procedures and techniques for well control are not included in this standard. Pages: 112

4th Edition | November 2012 | Product Number: G05304 | Price: $155.00

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

Kazakh translation of Std 53.

4th Edition | November 2012 | Product Number: G05304K | Price: $124.00

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: January 2012
Product Number: G59002 | Price: $122.00

RP 59 *
Recommended Practice for Well Control Operations—Kazakh

Kazakh translation of RP 59.

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

RP 59 *
Recommended Practice for Well Control Operations—Russian

Russian translation of RP 59.

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

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RP 64
Recommended Practice for Diverter Systems Equipment and Operations

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

2nd Edition | October 2001 | Reaffirmed: January 2012
Product Number: G64002 | Price: $107.00

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

Kazakh translation of RP 64.

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

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

Russian translation of RP 64.

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

SUBSEA PRODUCTION SYSTEMS

RP 17A/ISO 13628-1:2005
Design and Operation of Subsea Production Systems—General Requirements and Recommendations
(includes Addendum 1 dated December 2010)

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

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

4th Edition | January 2006 | Reaffirmed: April 2011
2-Year Extension: June 2016 | Product Number: GX17A04 | Price: $182.00

RP 17B
Recommended Practice for Flexible Pipe

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

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

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

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

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

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

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

Chinese translation of Spec 17D.

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

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Spec 17E/ISO 13628-5:2009 ◆
Specification for Subsea Umbilicals

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

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

4th Edition | October 2010 | 2-Year Extension: October 2012
Product Number: GX17E04 | Price: $194.00

Spec 17F ◆
Standard for Subsea Production Control Systems

Applies to design, fabrication, testing, installation, and operation of subsea production control systems. Spec 17F covers surface control system equipment, subsea-installed control system equipment, and control fluids. This equipment is utilized for control of subsea production of oil and gas and for subsea water and gas injection services. Where applicable, this specification may be used for equipment on multiple-well applications. This document establishes design standards for systems, subsystems, components, and operating fluids in order to provide for the safe and functional control of subsea production equipment. It contains various types of information related to subsea production control systems that includes: informative data that provide an overview of the architecture and general functionality of control systems for the purpose of introduction and information; basic prescriptive data that shall be adhered to by all types of control system; selective prescriptive data that are control-system-type sensitive and shall be adhered to only when they are relevant; and optional data or requirements that need be adopted only when considered necessary either by the purchaser or the vendor. In view of the diverse nature of the data provided, control system purchasers and specifiers are advised to select from this document only the provisions needed for the application at hand. Rework and repair of used equipment are beyond the scope of this specification. Pages: 114

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

RP 17G/ISO 13628-7:2005
Recommended Practice for Completion/Workover Riser

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

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

2nd Edition | July 2006 | Reaffirmed: April 2011 and September 2016
Product Number: GX17G02 | Price: $182.00

RP 17H
Remotely Operated Tools and Interfaces on Subsea Production Systems
(includes Errata 1 dated January 2014)

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

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

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

Spec 17J ◆
Specification for Unbonded Flexible Pipe
(includes Errata 1 dated September 2016)

Defines the technical requirements for safe, dimensionally and functionally interchangeable flexible pipes that are designed and manufactured to uniform standards and criteria. Minimum requirements are specified for the design, material selection, manufacture, testing, marking, and packaging of flexible pipes, with reference to existing codes and standards where applicable. See RP 17B for guidelines on the use of flexible pipes and ancillary components. This specification applies to unbonded flexible pipe assemblies, consisting of segments of flexible pipe body with end fittings attached to both ends. This specification does not cover flexible pipes of bonded structure. This specification does not apply to flexible pipe ancillary components. Guidelines for bend stiffeners and bend restrictors are given in Annex B. This specification does not apply to flexible pipes that include non-metallic tensile armour wires. Pipes of such construction are considered as prototype products subject to qualification testing. The applications addressed by this document are sweet and sour service production, including export and injection applications. Production products include oil, gas, water, and injection chemicals. This specification applies to both static and dynamic flexible pipes used as flowlines, risers, and jumpers. This specification does not apply to flexible pipes for use in choke-and-kill line applications. Pages: 90

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

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

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

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

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

Spec 17L1

Specification for Flexible Pipe Ancillary Equipment

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

Defines the technical requirements for safe, dimensionally and functionally interchangeable flexible pipe ancillary equipment that is designed and manufactured to uniform standards and criteria. Minimum requirements are specified for the design, material selection, manufacture, testing, documentation, marking, and packaging of flexible pipe ancillary equipment, with reference to existing codes and standards where applicable. The applicability relating to a specific item of ancillary equipment is stated at the beginning of the particular clause for the ancillary equipment in question. This document applies to the following flexible pipe ancillary equipment: bend stiffeners; bend restrictors; bellmouths; buoyancy modules and ballast modules; subsea buoys; tethers for subsea buoys and tether clamps; riser and tether bases; clamping devices; piggy-back clamps; repair clamps; I/J-tube seals; pull-in heads/installation aids; connectors; load-transfer devices; mechanical protection; and fire protection. This document may be used for bonded flexible pipe ancillary equipment, though any requirements specific to these applications are not addressed. This document does not cover flexible pipe ancillary equipment beyond the connector, with the exception of riser bases and load-transfer devices. Therefore, this document does not cover turret structures or I-tubes and J-tubes, for example. In addition, this document does not cover flexible pipe storage devices such as reels, for example. This specification is intended to cover ancillary equipment made from several material types, including metallic, polymer and composite materials. It may also refer to material types for particular ancillary components that are not commonly used for such components currently, but may be adopted more frequently in the future. Pages: 340

1st Edition | March 2013 | Product Number: G17L101 | Price: $170.00

RP 17L2

Recommended Practice for Flexible Pipe Ancillary Equipment

Provides guidelines for the design, materials selection, analysis, testing, manufacture, handling, transportation, installation, and integrity management of flexible pipe ancillary equipment. It presents the current best practice for design and procurement of ancillary equipment and gives guidance on the implementation of the specification for standard flexible pipe products. In addition, this document presents guidelines on the qualification of prototype products. The applicability relating to a specific item of ancillary equipment within this recommended practice is stated at the beginning of the clause dedicated to that item of ancillary equipment. This document applies to the following flexible pipe ancillary equipment: bend stiffeners; bend restrictors; bellmouths; buoyancy modules and ballast modules; subsea buoys; tethers for subsea buoys and tether clamps; riser and tether bases; clamping devices; piggy-back clamps; repair clamps; I/J-tube seals; pull-in heads/installation aids; connectors; load-transfer devices; mechanical protection; and fire protection. This document may be used for bonded flexible pipe ancillary equipment, though any requirements specific to these applications are not addressed. Where relevant, the applicability of recommendations to umbilicals is indicated in the Applicability subclause for the ancillary equipment in question. This document does not cover flexible pipe ancillary equipment beyond the connector, with the exception of riser bases and load-transfer devices. Therefore, this document does not cover turret structures or I-tubes and J-tubes, for example. In addition, it does not cover flexible pipe storage devices, for example reels. This recommended practice is intended to cover ancillary equipment made from several material types, including metallic, polymer, and composite materials. It may also refer to material types for particular ancillary components that are not commonly used for such components currently, but may be adopted in the future. Pages: 275

1st Edition | March 2013 | Product Number: G17L201 | Price: $170.00

RP 17N

Recommended Practice for Subsea Production System Reliability and Technical Risk Management

Provides a structured approach that organizations can adopt to manage this uncertainty throughout the life of a project. This may range from the management of general project risk through to the identification and removal of potential failure modes in particular equipment. This API recommended practice aims to provide operators, contractors, and suppliers with guidance in the application of reliability techniques to subsea projects within their scope of work and supply only. It is applicable to: standard and non-standard equipment and all phases of projects from feasibility studies to operation. This API recommended practice does not prescribe the use of any specific equipment or limit the use of any existing installed equipment or indeed recommend any action, beyond good engineering practice, where current reliability is judged to be acceptable. It is also not intended to replace individual company processes, procedures, document nomenclature, or numbering; it is a guide. However, this recommended practice may be used to enhance existing processes, if deemed appropriate. Most organizations will find much that is familiar and recognized as good practice. Some sections of the annex may only be of interest to the reliability specialist. The basic approach, however, is simple and consistent and when applied correctly has the potential to greatly reduce the financial risk of designing, manufacturing, installing, and operating subsea equipment. Pages: 99

1st Edition | March 2009 | 2-Year Extension: March 2011
Product Number: G17N01 | Price: $178.00

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 | Product Number: G17O02 | Price: $120.00

RP 17P/ISO 13628-15:2011

Design and Operation of Subsea Production Systems—Subsea Structures and Manifolds

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

This recommended practice covers subsea manifolds and templates utilized for pressure control in both subsea production of oil and gas, and subsea injection services. Equipment within the scope of this recommended practice is listed as follows: production and injection manifolds; modular and integrated single satellite and 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.

This edition of Spec 17P is the identical national adoption of ISO 13628-15:2011. Pages: 69

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

RP 17Q
Subsea Equipment Qualification—Standardized Process for Documentation

Provides guidance on relevant qualification methods that may be applied to facilitate subsea project execution. Qualification of subsea equipment is based on a breakdown of individual subsea components and categorization of those individual components based on classes of equipment and component functionality. A comprehensive component-level breakdown can cater to wide flexibility for field-specific configurations. The qualification process presented in this recommended practice is governed by component-level evaluation and referencing using two separate forms of documentation: failure mode assessments (FMAs) and product qualification sheets (PQSs). Detailed documentation resources related to the proactive qualification methodology presented in this recommended practice are provided in the annexes. These resources include an index of components and individual PQS documents. Documents relating to manufacturing inspection and Factory Acceptance Testing are outside the scope of this document.

The templates in Annex B (FMA Templates) and Annex C (PQS Templates) may be purchased separately in a Microsoft® Excel format for $59.00—Single User, or $308.00—Intranet Licensing. Pages: 65

1st Edition | June 2010 | 2-Year Extension: June 2012
Product Number: G17Q01 | Price: $134.00

RP 17R
Recommended Practice for Flowline Connectors and Jumpers

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

This document covers subsea flowline connectors and jumpers used for pressure containment in both subsea production of oil and gas, and subsea injection services. Equipment within the scope of this document are listed below.

Equipment used to make the following subsea connections are included:

- pipeline end terminations to manifolds,
- pipeline end terminations to trees,
- pipeline end terminations to riser bases,
- manifolds to trees,
- pipeline inline sleds to other subsea structures.

The following connection components and systems are included:

- jumper assemblies,
- monobore connectors systems,
- multibore connectors systems,
- pressure and flooding caps,
- connector actuation tools. Pages: 52

1st Edition | March 2015 | Product Number: G17R01 | Price: $120.00

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

Provides recommendations for the sizing, specification, system integration, and testing of subsea flow meters [referred to as multiphase flow meters (MPFMs)] for measurement of full stream, multiphase flow. In subsea applications, MPFMs are normally used in well testing, allocation measurement, fiscal measurement, well management, and/or flow assurance applications. The categorization of MPFM application is important since it can be used to determine the required level of factory testing, independent verification, field maintenance, and ongoing verification required during operation. This document includes wet gas flow meters as a subset of MPFMs. In-line MPFMs are typically used in subsea applications and are the focus of this document. These recommendations and guidelines are intended for use by the engineer responsible for the delivery of the MPFM. Pages: 32

1st Edition | June 2015 | Product Number: G17S01 | Price: $85.00

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

Defines the methodology and test procedures necessary for the evaluation of polymeric materials suitable for use as the internal pressure sheath of an unbonded flexible pipes in high temperature applications. It describes the processes by which the critical material properties, both static and dynamic, can be measured and evaluated against relevant performance criteria.

This document relates primarily to the properties necessary for an internal pressure sheath required for oil and gas production. These are most relevant to high temperature applications. Only thermoplastic materials are considered for the internal pressure sheath. Elastomeric materials, which are used in bonded flexible pipes, are not considered in this document. Pages: 47

1st Edition | March 2003 | Product Number: G17TR11 | Price: $132.00

TR 17TR2
The Aging of PA-11 In Flexible Pipes

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

1st Edition | June 2003 | Product Number: G17TR21 | Price: $101.00

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: $132.00

TR 17TR4 ■
Subsea Equipment Pressure Ratings

The impact of operation in deep water on the pressure rating of equipment is a special concern. The objective of this document is to foster a better understanding of the effects of simultaneous internal and external pressures on the internal pressure rating of well control equipment. Pages: 12

2nd Edition | May 2016 | Product Number: G17TR402 | Price: $65.00

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

Addresses the avoidance of blockages in subsea production control and chemical injection systems (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: $98.00

TR 17TR6
Attributes of Production Chemicals in Subsea Production Systems

Identifies and specifies the essential attributes of production chemicals intended to be introduced to subsea oil and gas production systems. The document is intended for use by chemical suppliers to facilitate the provision of chemicals compatible with existing and intended subsea production systems (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: $98.00

TR 17TR8
High-Pressure High-Temperature Design Guidelines

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

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

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

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

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

TR 17TR10
Subsea Umbilical Termination (SUT) Design Recommendations

Provides best practice technical guidance for subsea umbilical design (SUT) design, in order to aid in making informed choices during the design phase.

This document was generated in response to the increasing difficulties in installation of high-functionality SUTs, due to their increasing size.

This document is intended to be used as a reference guide by operators, umbilical termination assembly (UTA) and umbilical 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: $104.00

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

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

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

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

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

This document provides guidance for subsea equipment designers/manufacturers to properly account for external pressure (or in some cases, differential pressure) when designing and validating subsea equipment. Additionally, this technical report provides guidance to equipment purchaser/end-user to appropriately select rated equipment for their subsea systems with consideration to the effects of external pressure in addition to internal pressure, including differential pressure across a 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: $95.00

TR 17TR13 ■
General Overview of Subsea Production Systems

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

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

RP 17U
Recommended Practice for Wet and Dry Thermal Insulation of Subsea Flowlines and Equipment

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

This recommended practice is applicable to the following systems and components:

- flowlines and risers;
- christmas tree, valve block, and piping;
- manifold valves and pipework;
- PLET piping;
- jumpers (i.e. piping and bends);
- connectors and fittings;
- valves and chokes. Pages: 24

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

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

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

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

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

RP 17W
Recommended Practice for Subsea Capping Stacks

Contains subsea capping stack recommended practices for designing, building, and using, as well as maintaining and testing during storage. The document focuses on:

- topics for drafting a Basis of Design (BOD) document that could be used to constructing a new subsea capping stack,
- topics that may drive improvements for existing subsea capping stack equipment, and
- topics for drafting plans for storing, transporting, maintaining, and testing a subsea capping stack.

Other important elements of a complete subsea capping stack system that are addressed in this document include:

- minimal documentation requirements,
- minimal analysis and modeling that should accompany any subsea capping stack design,
- competencies of personnel who operate, maintain, and test subsea capping stacks, and
- potential unknowns/risks that may be encountered with incident wells that impact the use of a subsea capping stack and relevant contingency procedures.

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

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

COMPLETION EQUIPMENT

Spec 11D1/ISO 14310:2008 ◆
Packers and Bridge Plugs

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

This specification includes the following annexes:

- Annex A: Use of API Monogram by Licensees;
- Annex B: Requirements for HPHT Environment Equipment;
- Annex C: Requirements for HPHT Environment Operational Tools;
- Annex D: External Flow Testing Requirements.

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

3rd Edition | April 2015 | Effective Date: October 9, 2015
Product Number: G11D103 | Price: $115.00

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

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

3rd Edition | June 2008 | Reaffirmed: March 2015
Product Number: G11V53 | Price: $155.00

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

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

Sets guidelines for continuous flow gas lift installation designs using injection pressure operated valves. The assumption is made that the designer is familiar with and has available data on the various factors that affect a design. Pages: 88

2nd Edition | July 1999 | Reaffirmed: March 2015
Product Number: G11V62 | Price: $149.00

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

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

1st Edition | September 2003 | Reaffirmed: March 2015
Product Number: G11V81 | Price: $119.00

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
Product Number: G19AC01 | Price:$112.00

RP 19B ◆
Recommended Practice for Evaluation of Well Perforators
(formerly RP 43)
(includes Addendum 1 dated April 2014 and Addendum 2 dated December 2014)

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

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

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

2nd Edition | September 2006 | Reaffirmed: April 2011
Product Number: G019B2 | Price: $122.00

RP 19B *
Recommended Practice for Evaluation of Well Perforators—Chinese (formerly RP 43)

Chinese translation of RP 19B.

2nd Edition | September 2006
Product Number: G019B2C | Price: $86.00

RP 19B *
Recommended Practice for Evaluation of Well Perforators—Kazakh (formerly RP 43)

Kazakh translation of RP 19B.

2nd Edition | September 2006
Product Number: G019B2K | Price: $98.00

RP 19B *
Recommended Practices for Evaluation of Well Perforators—Russian

Russian translation of RP 19B.

2nd Edition | September 2006
Product Number: G019B2R | Price: $97.00

RP 19C/ISO 13503-2:2006
Measurement of Properties of Proppants Used in Hydraulic Fracturing and Gravel-Packing Operations

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

This edition of RP 19C is the identical national adoption of ISO 13503-2:2006 and replaces RP 56 and RP 58. Pages: 30

1st Edition | May 2008 | Reaffirmed: June 2016
Product Number: GX19C01 | Price: $113.00

RP 19D/ISO 13503-5:2006
Measuring the Long-Term Conductivity of Proppants
(includes Errata 1 dated July 2008)

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

This edition of RP 19D is the identical national adoption of ISO 13503-5:2006 and replaces RP 61. Pages: 24

1st Edition | May 2008 | Reaffirmed: May 2015
Product Number: GX19D01 | Price: $107.00

*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.

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

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

This specification does not include gas-lift or any other flow-control valves or devices, latches, and/or associated wire line equipment that may or may not be covered in other ISO specifications.

The side-pocket mandrels to which this specification refers are independent devices that can accept installation of flow control or other devices down-hole.

This edition of Spec 19G1 is the modified national adoption of ISO 17078-1:2004. Pages: 43

1st Edition | May 2010 | 2-Year Extension: February 2015
Product Number: GG19G11 | Price: $103.00

Spec 19G1/ISO 17078-1:2004 *
Side-Pocket Mandrels—Chinese

Chinese translation of Spec 19G1

1st Edition | May 2010 | Product Number: GG19G101C | Price: $73.00

Spec 19G2/ISO 17078-2:2007 ◆
Flow-Control Devices for Side-Pocket Mandrels

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

The installation and retrieval of flow-control devices is outside the scope of Spec 19G2. Additionally, Spec 19G2 is not applicable to flow-control devices used in center-set mandrels or with tubing-retrievable applications.

Spec 19G2 does not include requirements for side-pocket mandrels, running, pulling, and kick-over tools, and latches that might or might not be covered in other API/ISO specifications. Reconditioning of used flow-control devices is outside of the scope of Spec 19G2.

This edition of Spec 19G2 is the modified national adoption of ISO 17078-2:2007. Pages: 132

1st Edition | June 2010 | 2-Year Extension: February 2015
Product Number: GX19G21 | Price: $155.00

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 | Price: $145.00

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 | Price: $155.00

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

Provides recommended practices for the selection, design, operation, surveillance, optimization, automation, and troubleshooting of dual gas-lift wells.

The purpose of this document is to present recommended practices, guidelines, and tools to help obtain optimum production from dual gas-lift wells. This document also contains practices that should be avoided to minimize problems, inefficiencies, and poor economics that may be associated with ineffective dual gas-lift operations. Compared to single completions, dual completions typically have a higher initial cost, have more operating problems, are more difficult and expensive to work over, and may produce less efficiently.

It is not the purpose of this document to recommend the practice of dual gas-lift. In some cases, dual gas-lift is problematic and often ineffective. Often it is difficult or even impossible to effectively produce both completions in a dual well using gas-lift, over the long term. Where there are other feasible alternatives to produce dual wells, they should be considered. However, many dually completed oil wells should be artificially lifted—initially, or after reservoir pressures have declined and/or water cuts have increased. In many cases, the only practical method of artificial lift for these wells is gas-lift. Therefore, every effort should be made to design and operate dual gas-lift systems as effectively as possible. Pages: 90

2nd Edition | April 2015 | Product Number: G19G92 | Price: $165.00

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: $132.00

*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.

Spec 19V/ISO 28781:2010 ◆
Subsurface Barrier Valves and Related Equipment

Provides the requirements for subsurface barrier valves and related equipment as they are defined herein for use in the petroleum and natural gas industries. Included are the requirements for design, design validation, manufacturing, functional evaluation, repair, redress, handling, and storage. Subsurface barrier valves provide a means of isolating the formation or creating a barrier in the tubular to facilitate the performance of pre- and/or post-production/injection operational activities in the well.

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

This International Standard does not cover installation and maintenance, control systems such as computer systems, and control conduits not integral to the barrier valve. Also not included are products covered under ISO 17078, ISO 16070, ISO 14310, ISO 10432, and ISO 10423 and the following products: downhole chokes, wellhead plugs, sliding sleeves, casing-mounted flow-control valves, injection valves, well-condition-activated valves or drill-stem test tools. This International Standard does not cover the connections to the well conduit.

This edition of Spec 19V is the modified national adoption of ISO 28781:2010. Pages: 58

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

SUPPLY CHAIN MANAGEMENT

Spec 20A ◆
Carbon Steel, Alloy Steel, Stainless Steel, and Nickel Base Alloy Castings for Use in the Petroleum and Natural Gas Industry
(includes Addendum 1 dated October 2013, Addendum 2 dated April 2015, and Errata 1 dated August 2015)

Specifies requirements for the design, qualification, production, marking, and documentation of steel and nickel base alloy castings used in the petroleum and natural gas industries. This standard applies to castings used in the manufacture of pressure containing, pressure controlling, and primary load bearing components. This standard establishes requirements for four casting specification levels (CSL) that define different levels of cast product technical, quality and qualification requirements. Pages: 29

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

Spec 20B ◆
Open Die Shaped Forgings for Use in the Petroleum and Natural Gas Industry
(includes Errata dated December 2013)

Specifies requirements for the qualification and production of open die shaped forgings for use in API service components in the petroleum and natural gas industries when referenced by an applicable equipment standard or otherwise specified as a requirement for compliance.

This API standard is applicable to equipment used in the oil and natural gas industries where service conditions warrant the use of individually shaped open die forgings, including rolled rings. Examples include pressure containing or load bearing components. Forged bar, rolled bar, and forgings from which multiple parts are removed are beyond the scope of this specification.

This API standard establishes requirements for four forging specification levels (FSL). These four FSL designations define different levels of forged product technical, quality and qualification requirements. Pages: 20

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

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

Specifies requirements and gives recommendations for the design, qualification, and production of closed-die forgings for use in API service components in the petroleum and natural gas industries when referenced by an applicable equipment standard or otherwise specified as a requirement for compliance. Spec 20C is applicable to equipment used in the oil and natural gas industries where service conditions warrant the use of closed die forgings. Examples include pressure containing or load-bearing components. This standard establishes requirements for four forging specification levels (FSL). These FSL designations define different levels of forged product technical, quality and qualification requirements. Pages: 30

2nd Edition | October 2015 | Effective Date: November 1, 2016
Product Number: G20C02 | Price: $81.00

Std 20D
Nondestructive Examination Services for Equipment Used in the Petroleum and Natural Gas Industry
(includes Addendum 1 dated October 2016)

Specifies requirements for the design, development and qualification of nondestructive examination methods used in the manufacturer of equipment for the petroleum and natural gas industries. This is applicable to suppliers providing nondestructive examination (NDE) services for equipment used in the oil and natural gas industries. The requirements of this standard apply to magnetic particle, liquid penetrant, radiographic, and ultrasonic methods of nondestructive examination. Pages: 21

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

Spec 20E ◆
Alloy and Carbon Steel Bolting for Use in the Petroleum and Natural Gas Industries
(includes Errata dated October 2014)

Specifies requirements for the qualification, production, and documentation of alloy and carbon steel bolting used in the petroleum and natural gas industries. This standard applies to bolting used in pressure-containing and primary load-bearing oil and gas equipment. This standard establishes requirements for three bolting specification levels (BSL) that define different levels of technical, quality, and qualification requirements. Pages: 19

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

Spec 20F ◆
Corrosion Resistant Bolting for Use in the Petroleum and Natural Gas Industries

Establishes requirements for two bolting specification levels (BSLs). These two BSL designations define different levels of technical, quality, and qualification requirements. The levels are designated as BSL-2 and BSL-3. BSL-2 includes requirements in addition to those stated in the ASTM A453 and Std 6A718. BSL-3 adds technical, quality and qualification criteria to BSL-2. BSL-2 and BSL-3 are intended to be comparable to BSL-2 and BSL-3 as found in Spec 20E. BSL-1 is omitted from this specification.

This specification covers the following product forms, processes, and sizes:
- machined studs;
- machined bolts, screws, and nuts;
- cold headed bolts, screws, and nuts;
- hot formed bolts and screws <1.5 in. (38.1 mm) nominal diameter;
- hot formed bolts and screws ≥1.5 in. (38.1 mm) nominal diameter;
- roll threaded studs, bolts, and screws <1.5 in. (38.1 mm) diameter;
- roll threaded studs, bolts, and screws ≥1.5 in. (38.1 mm) diameter;
- hot formed nuts <1.5 in. (38.1 mm) nominal diameter;
- hot formed nuts ≥1.5 in. (38.1 mm) nominal diameter. Pages: 16

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

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: 24

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

DRILLING AND PRODUCTION OPERATIONS

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

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

1st Edition | August 1997 | Reaffirmed: February 2014
Product Number: G31A01 | Price: $97.00

RP 45
Recommended Practice for Analysis of Oilfield Waters

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

3rd Edition | August 1998 | Reaffirmed: February 2014
Product Number: G45003 | Price: $142.00

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

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

2nd Edition | December 1995 | Reaffirmed: January 2013
Product Number: G50002 | Price: $109.00

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

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

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

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

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

1st Edition | July 2009 | Reaffirmed: December 2015
Product Number: G51R01 | Price: $76.00
You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

RP 52
Land Drilling Practices for Protection of the Environment

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

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

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

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

1st Edition | January 1998 | Reaffirmed: September 2010
Product Number: G68001 | Price: $76.00

RP 80
Guidelines for the Definition of Onshore Gas Gathering Lines

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

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

RP 90
Annular Casing Pressure Management for Offshore Wells

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

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

RP 90-2 ■
Annular Casing Pressure Management for Onshore Wells

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

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

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

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

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

Lost circulation during drilling operations, in the form of both seepage and fracture losses, is a common occurrence in the Gulf of Mexico and other OCS environments. Through extensive practical experience, operators and drilling contractors have learned that with proper information, planning, and execution, lost circulation can be safely managed to allow well construction goals to be met. The methods used to repair or manage lost circulation are based on well location, geology, pore and fracture pressures, drilling depth, well design, hydraulics, mud properties, and available contingencies. Pages: 14

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

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

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

1st Edition | November 2008 | Reaffirmed: April 2013
Product Number: G92U01 | Price: $105.00

RP 96
Deepwater Well Design and Construction

Provides engineers a reference for deepwater (DW) well design as well as drilling and completion operations. This recommended practice (RP) will also be useful to support internal reviews, internal approvals, contractor engagements, and regulatory approvals.

The scope of this RP is to discuss DW drilling and completion activities performed on wells that are constructed using subsea blowout preventers (BOPs) with a subsea wellhead. This document addresses the following.

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

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

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

- Detailed casing design load case definitions (does not include specific casing designs or design factors). Individual companies combine differing severities of loads and resistances or differing calculation methods to achieve designs with similar high levels of reliability.
- Wells drilled and/or completed with a surface BOP and high pressure riser from a floating production system; however, considerations for wells predrilled with floating rigs to be completed to a floating production system are included.
- Well control procedures (refer to RP 59 for well control information).
- Managed pressure drilling operations (including dual gradient drilling).
- Production operations and fluids handling downstream of the tree (subsea facilities/subsea architecture and surface facilities/offloading hydrocarbons).
- Intervention operations.
- Quality assurance programs. Pages: 158

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

Bull 97
Well Construction Interface Document Guidelines

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

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

RP 98
Personal Protective Equipment Selection for Oil Spill Responders

Provides general information and guidance for the development of oil spill responder Personal Protective Equipment (PPE) control measures. Although an extensive amount of information has been developed on the topic of PPE for emergency responders, this document focuses on the PPE selection process as well as its technical evaluation based on the hazards present.

The purpose of this recommended practice is to assist users in developing effective PPE control measures for oil spill responses using a systematic approach. This recommended practice is intended for any company, organization, or agency that oversees or responds to oil spills. It is not a comprehensive "how-to" guide to selecting PPE for every type of situation that may be encountered; rather, it is a guidance document that discusses how proper PPE selection may be a useful control measure for responders when engineering and administrative controls may not be feasible or effective in reducing exposure to acceptable levels. Pages: 79

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

RP 99
Flash Fire Risk Assessment for the Upstream Oil and Gas Industry

Provides guidance for the upstream oil and gas industry on hazard identification and risk assessment exercises to assess and mitigate the risk of human injury caused by exposure to a flash fire. The scope of this document is limited to personnel exposed to the risk of hydrocarbon based flash fires in the upstream Exploration and Production (E&P) sector of the oil and gas industry. In general, this group includes oil and gas production, drilling, well bore (well servicing) operations, and gas processing prior to interstate pipeline transportation. Pages: 30

1st Edition | April 2014 | Product Number: G09901 | Price: $80.00

DRILLING AND PRODUCTION OPERATIONS: TRAINING

Gas Lift
(Book 6 in the Vocational Training Series)

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

3rd Edition | January 1994 | Reaffirmed: March 2007
Product Number: GVT063 | Price: $157.00

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

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

5th Edition | June 1996 | Reaffirmed: March 2007
Product Number: GVT015 | Price: $157.00

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

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

3rd Edition | January 1995 | Reaffirmed: March 2007
Product Number: GVT033 | Price: $97.00

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

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

3rd Edition | January 1994 | Reaffirmed: March 2007
Product Number: GVT053 | Price: $122.00

RP T-1 ■
Creating Orientation Programs for Personnel Going Offshore

Serves as a guide to develop orientation materials for personnel and visitors prior to their first trip offshore. The scope and applicability of this document concludes after check-in at the offshore facility and receipt of the facility-specific orientation. Pages: 18

5th Edition | November 2016 | Product Number: GT1005 | Price: $65.00

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: GT7002 | Price: $59.00

RP T-4
Training of Offshore Personnel in Nonoperating Emergencies

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

2nd Edition | October 1995 | Reaffirmed: June 2010
Product Number: GT4002 | Price: $59.00

■ This publication is a new entry in this catalog.

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

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

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

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

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

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

2nd Edition | October 1995 | Reaffirmed: January 2013
Product Number: GT7002 | Price: $57.00

SPECIAL PUBLICATIONS

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

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

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

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

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

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

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

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

- 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 | Product Number: G100201 | Price: $90.00

Bull 100-3
Community Engagement Guidelines

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

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

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

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

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

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

VOLUNTARY OPERATING AGREEMENTS AND BULLETINS

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

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

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

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

API HF1
Hydraulic Fracturing Operations—Well Construction and Integrity Guidelines

Provides guidance and highlights industry recommended practices for well construction and integrity for wells that will be hydraulically fractured. The guidance provided here will help to ensure that shallow groundwater aquifers and the environment will be protected, while also enabling economically viable development of oil and natural gas resources. This document is intended to apply equally to wells in either vertical, directional, or horizontal configurations. Maintaining well integrity is a key design principle and design feature of all oil and gas production wells. Maintaining well integrity is essential for the two following reasons.

- To isolate the internal conduit of the well from the surface and subsurface environment. This is critical in protecting the environment, including the groundwater, and in enabling well drilling and production.
- To isolate and contain the well's produced fluid to a production conduit within the well.

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

1st Edition | October 2009 | Product Number: GHF101 | Price: $42.00
You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

API HF2
Water Management Associated with Hydraulic Fracturing

Identifies and describes many of the current industry best practices used to minimize environmental and societal impacts associated with the acquisition, use, management, treatment, and disposal of water and other fluids associated with the process of hydraulic fracturing. While this document focuses primarily on issues associated with hydraulic fracturing pursued in deep shale gas development, it also describes the important distinctions related to hydraulic fracturing in other applications. Moreover, this guidance document focuses on areas associated with the water used for purposes of hydraulic fracturing and does not address other water management issues and considerations associated with oil and gas exploration, drilling, and production. These topics will be addressed in future API documents. Pages: 26

1st Edition | June 2010 | Product Number: GHF201 | Price: $42.00
You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

API HF3
Practices for Mitigating Surface Impacts Associated with Hydraulic Fracturing

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

1st Edition | January 2011 | Product Number: GHF301 | Price: 42.00
You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

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

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

3rd Edition | May 2001 | Reaffirmed: January 2013
Product Number: G49003 | Price: $88.00

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

Kazakh translation of RP 49.

3rd Edition | May 2001 | Product Number: G4903K | Price: $71.00

RP 49 *
Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide—Russian

Russian translation of RP 49.

3rd Edition | May 2001 | Product Number: G04903R | Price: $68.00

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

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

1st Edition | July 2009 | Reaffirmed: December 2015
Product Number: G51R01 | Price: $76.00
You may download a PDF of this document from the Policy & Issues/ Hydraulic Fracturing section of the API website.

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

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

3rd Edition | August 1999 | Reaffirmed: January 2013
Product Number: G54003 | Price: $125.00

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

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

Kazakh translation of RP 54.

3rd Edition | August 1999 | Product Number: G54003K | Price: $100.00

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

Russian translation of RP 54.

3rd Edition | August 1999 | Product Number: G54003R | Price: $100.00

RP 55
Recommended Practice for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide

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

2nd Edition | February 1995 | Reaffirmed: January 2013
Product Number: G55002 | Price: $115.00

RP 67
Recommended Practice for Oilfield Explosives Safety

Applies to explosives used in oil and gas well operations, more specifically, explosives used inside the wellborne. Guidance is provided for explosives transportation, on-site explosives loading and unloading operations, electrical wireline operations, tubing conveyed operations, self-contained activating tools, setting tools, sidewall sample taker tools, select fire perforating guns, and bullet perforating guns. Recommendations are presented regarding surface equipment and downhole equipment. Recommended training and minimum qualifications are presented for personnel who participate in handling and using explosives at the well site. Pages: 18

2nd Edition | May 2007 | Reaffirmed: January 2015
Product Number: G06702 | Price: $85.00

RP 67 *
Recommended Practice for Oilfield Explosives Safety—Kazakh

Kazakh translation of RP 67.

2nd Edition | May 2007 | Product Number: G09308K | Price: $68.00

RP 67 *
Recommended Practice for Oilfield Explosives Safety—Russian

Russian translation of RP 67.

2nd Edition | May 2007 | Product Number: G09309R | Price: $69.00

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: $61.00

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

Provides guidance for use in preparing safety and environmental management programs (SEMP) for oil, gas, and sulphur operations and facilities located on the outer continental shelf (OCS). These guidelines are applicable to well drilling, servicing, and production; and pipeline facilities and operations that have the potential for creating a safety or environmental hazard at OCS platform sites. Eleven major program elements are included for application to these facilities and operations. Identification and management of safety and environmental hazards are addressed in design, construction, startup, operation, inspection, and maintenance of new, existing, and modified facilities. Pages: 41

3rd Edition | May 2004 | Reaffirmed: April 2013
Product Number: G07503 | Price: $89.00

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

Chinese translation of RP 75.

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

Bull 75L
Guidance Document for the Development of a Safety and Environmental Management System for Onshore Oil and Natural Gas Production Operations and Associated Activities

Provides general information and guidance for the development of a safety and environmental management system (SEMS) for onshore oil and natural gas operations, including drilling, production, and well servicing activities. Although there is an extensive amount of information that has been developed on the topic of safety and environmental management systems, this document focuses on this industry sector to help foster continuous improvement in our industry's safety and environmental performance. It is recognized that many onshore oil and natural gas companies have effective SEMS in place; however, the intent of this document is to provide an additional tool that can assist these and especially other operators in taking the next step toward implementing a complete system at a pace that complements their business plan. For those who already have a mature SEMS in place, this document can be used for continuous improvement of the system. Pages: 12

1st Edition | November 2007 | Product Number: G75L01 | Price: $34.00

RP 76
Contractor Safety Management for Oil and Gas Drilling and Production Operations

Intended to assist operators, contractors, and subcontractors (third parties) in the implementation of a contractor safety program and improve the overall safety performance while preserving the independent contractor relationship. It is intended for the Upstream Segment of the petroleum industry; however, since the operator requirements and the contracted work are diverse, this publication may not be applicable to all operations at each company or to all contract work performed in those operations. Many oil and gas exploration and production companies contract for equipment and personnel services for a wide range of activities, including drilling production, well servicing, equipment repair, maintenance, and construction. Certain activities of contractors have the potential to take place either contractor and/or operator personnel and/or equipment at risk. It is important that operations are carried out in a safe manner. Operators and contractors need to provide safe work places and to protect the safety of their work places and to protect the safety of their workforces and the general public. When they work together to improve safety, both benefit. Pages: 60

2nd Edition | November 2007 | Reaffirmed: January 2013
Product Number: G07602 | Price: $57.00

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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: $142.00

Bull E3

Well Abandonment and Inactive Well Practices for U.S. Exploration and Production Operations, Environmental Guidance Document

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

1st Edition | January 1993 | Reaffirmed: June 2000
Product Number: G11007 | Price: $142.00

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: $169.00

Publ 4702

Technologies to Reduce Oil and Grease Content of Well Treatment, Well Completion, and Workover Fluids for Overboard Disposal

Technologies to reduce oil and grease content of well treatment, well completion, and workover fluids for overboard disposal. Pages: 54

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

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: $122.00

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: $115.00

Publ 7101

A National Survey on Naturally Occurring Radioactive Material (NORM) in Petroleum Producing and Gas Processing Facilities

Defines the general occurrence of NORM in the United States based on statistical analysis of gamma measurements taken external to certain petroleum producing and gas processing equipment. Pages: 265

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

Publ 7102

Methods for Measuring Naturally Occurring Radioactive Materials (NORM) in Petroleum Production Equipment

The use and capabilities of common field-survey equipment are characterized for measuring NORM in sludges and scales accumulated in oil and gas production equipment. A correlation between radium concentrations in accumulated scales and sludges and measured external radiation is presented. Pages: 85

October 1997 | Product Number: G71021 | Price: $115.00

Publ 7103

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

Presents radiological analyses of disposal alternatives that will protect against elevated radiation exposures and facilitate cost-effective precautions that are proportionate to any hazards posed by the NORM. Four waste forms and 12 waste disposal alternatives were analyzed. Pages: 65

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

Publ 7104
Proceedings of the 1995 API and GRI Naturally Occurring Radioactive Material (NORM) Conference

A compilation of 17 papers presented at the 1995 API/GRI NORM Conference. Subjects include measurement and survey; regulatory issues and activities; management and disposal; and scale prediction and control. Pages: 225

October 1997 | Product Number: G71041 | Price: $115.00

Publ 7105
Probabilistic Estimates of Dose and Indoor Radon Concentrations Attributable to Remediated Oilfield Naturally Occurring Radioactive Material (NORM)

Evaluates the concentration limit of 30 pCi/g Ra-226 in pipe scale and sludge left near the surface of remediated oilfield sites and returned to unrestricted public use. Includes an extensive bibliography of NORM research. Pages: 97

October 1997 | Product Number: G71051 | Price: $115.00

HEALTH, ENVIRONMENT, AND SAFETY: WASTE

Guidelines for Commercial Exploration and Production Waste Management

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 ww.api.org/environment-health-and-safety/environmental-performance/environmental-stewardship/waste-management-facilities.aspx

Protecting Livestock Answers to Frequently Asked Questions about Livestock Exposure to Crude Oil in Oilfield Operations

Describes ways livestock might be significantly exposed to petroleum hydrocarbons via a conceptual site model and outlines how to make a screening level determination of whether or not livestock are at risk from the exposure.

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

API E5
Environmental Guidance Document: Waste Management in Exploration and Production Operations

Includes recommendations for the environmentally sound management of solid waste resulting from the exploration and production of oil and gas. Guidance is provided for the management of drilling fluids, produced waters, and other wastes associated with the operation of gas plants, field facilities, drilling, and workover. Pages: 84

2nd Edition | February 1997 | Product Number: GE5002 | Price: $125.00

SECURITY

API Standard for Third Party Network Connectivity

Provides guidance for implementing secure third-party connections between the information technology systems and a network of two companies that have a business relationship and a common objective. The standard provides suggestions for companies to follow to establish third-party network connections, while protecting their individual systems and data from unauthorized access or manipulation. Pages: 36

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

Security Guidelines for the Petroleum Industry

API's 3rd Edition of this document is now in use at oil and gas facilities around the world to help managers decide how to deter terrorist attacks. Covering all segments of the industry (production, refining, transportation, pipeline, and marketing), this guidance builds on the existing solid foundation of design and operational regulations, standards, and recommended practices, which relate to facility design and safety, environmental protection, emergency response, and protection from theft and vandalism. Produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies, these guidelines, viewed as a living document, are broadly applicable to facility security in light of September 11, 2001 and provide the starting point for developing security plans at oil and natural gas facilities and operations. Pages: 58

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

Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

The American Petroleum Institute and the National Petrochemical & Refiners Association jointly developed a new methodology for evaluating the likelihood and consequences of terrorist attacks against refineries and petrochemical facilities. *Security Vulnerability Assessment Methodology for Petroleum and Petrochemical Facilities* is designed for companies to use in assessing vulnerabilities and potential damages from different kinds of terrorist attacks. In the post September 11 era, companies have reevaluated and enhanced security at their facilities. The methodology will provide officials with a new analytical tool to determine "the likelihood of an adversary successfully exploiting vulnerability and the resulting degree of damage or impact." This vulnerability assessment methodology was produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies. Pages: 155

October 2004 | Product Number: OSVA02 | Price: $191.00

RP 70
Security for Offshore oil and Natural Gas Operations

Intended to assist the offshore oil and natural gas drilling and producing operators and contractors in assessing security needs during the performance of oil and natural gas operations. It includes information on security awareness, conducting security vulnerability assessments when warranted, and developing security plans for offshore facilities. Pages: 16

1st Edition | March 2003 | Reaffirmed: September 2010
Product Number: G07001 | Price: $57.00

RP 70I
Security for Worldwide Offshore Oil and Natural Gas Operations

Intended to assist the offshore oil and natural gas drilling and producing operators and contractors in assessing security needs during the performance of oil and natural gas operations worldwide. Pages: 14

1st Edition | April 2004 | Reaffirmed: January 2012
Product Number: G70I03 | Price: $61.00

If you have questions or comments regarding API standards, please visit www.api.org/standards.

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: $9,064.00 | *Price subject to change (If purchased individually, a complete set would cost approximately $10,300.00)

Chapter 1 [Historical]
Vocabulary

Provides definitions and terms used throughout the API *Manual of Petroleum Measurement Standards* (*MPMS*). Pages: 70

2nd Edition | July 1994 | Product Number: H01002 | Price: $109.00

Current definitions may be accessed through the Ch. 1 database: http://chapter1.api.org

Chapter 1 * [Historical]
Vocabulary—Spanish

Spanish translation of Ch. 1.

2nd Edition | July 1994 | Product Number: H010SP | Price: $109.00

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

Procedures for calibrating upright cylindrical tanks used primarily for the storage of petroleum liquids. Ch. 2.2A addresses necessary measurement procedures to determine total and incremental tank volumes and procedures for computing volumes. Both metric and customary units are included. The metric units reflect what is available in commercial equipment. The standard also provides guidelines for recalibration and computerization of capacity tables. Ch. 2.2A should be used in conjunction with Ch. 2.2B. These two standards combined supersede the previous Std 2550. Pages: 58

1st Edition | February 1995 | Reaffirmed: February 2012
Product Number: H022A1 | Price: $125.00

Chapter 2.2B
Calibration of Upright Cylindrical Tanks Using the Optical Reference Line Method

Describes measurement and calculation procedures for determining the diameters of upright, welded (lap/butt) cylindrical tanks, or vertical cylindrical tanks, with a smooth outside surface and either floating or fixed roofs. The optical reference line method is an alternative to the manual tank strapping method for determining tank diameter. Ch. 2.2B should be used in conjunction with Ch. 2.2A. Pages: 8

1st Edition | March 1989 | Reaffirmed: January 2013
Product Number: H30023 | Price: $83.00

Chapter 2.2C/ISO 7507-3:1993
Calibration of Upright Cylindrical Tanks Using the Optical-Triangulation Method
(ANSI/API *MPMS* Ch. 2.2C-2002)

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

This edition of Ch. 2.2C is the modified national adoption of ISO 7507-3:1993. Pages: 19

1st Edition | January 2002 | Reaffirmed: April 2013
Product Number: H022C1 | Price: $83.00

Chapter 2.2D/ISO 7507-4:1995
Calibration of Upright Cylindrical Tanks Using the Internal Electro-Optical Distance Ranging Method
(ANSI/API *MPMS* Ch. 2.2D-2003)

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

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

1st Edition | August 2003 | Reaffirmed: March 2014
Product Number: H022D1 | Price: $83.00

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: $88.00

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Chapter 2.2F/ISO 12917-2:2002
Petroleum and Liquid Petroleum Products—Calibration of Horizontal Cylindrical Tanks—Part 2: Internal Electro-Optical Distance-Ranging Method
(ANSI/API *MPMS* Ch. 2.2F)

Specifies a method for the calibration of horizontal cylindrical tanks having diameters greater than 2 m (6 ft) by means of internal measurements using an electro-optical distance-ranging instrument, and for the subsequent compilation of tank-capacity tables. This method is known as the internal electro-optical distance-ranging (EODR) method.

This edition of Ch. 2.2F is the national adoption of ISO 12917-2:2002. Pages: 14

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

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

Describes measurement and calculation procedures for determining the diameters of upright cylindrical tanks by taking vertical offset measurements externally using electro-optical distance ranging equipment rather than conventional ORLM plummet/trolley equipment. This standard is an alternate standard to Ch. 2.2B. This standard is used in conjunction with Ch. 2.2A. Calibration of insulated tanks is covered by Ch. 2.2D. Abnormally deformed tanks that are dented or have other visible signs of damage are not covered by this standard. Pages: 14

1st Edition | July 2014 | Product Number: H202G01 | Price: $80.00

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: September 2012
Product Number: H25520 | Price: $97.00

Std 2554
Measurement and Calibration of Tank Cars

Describes the procedures for calibrating tank cars. It outlines procedures for nonpressure-type tank cars and pressure-type tank cars. Pages: 41

1st Edition | October 1966 | Reaffirmed: September 2012
Product Number: H25540 | Price: $115.00

Std 2555
Liquid Calibration of Tanks

Describes the procedure for calibrating tanks, or portions of tanks, larger than a barrel or drum by introducing or withdrawing measured quantities of liquid. Pages: 14

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

RP 2556
Correcting Gauge Tables for Incrustation

Incrustation is defined in this publication as any material that adheres to the internal vertical sidewall surfaces of a tank when the tank is otherwise empty. The tables given in this recommended practice show the percent of error of measurement caused by varying thicknesses of uniform incrustation in tanks of various sizes. Pages: 3

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

Chapter 2.7
Calibration of Barge Tanks

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

- Liquids calibration.
- Calibration by linear measurement.
- Calibration from vessel drawings.

This document and Ch. 2.8A supersede the previous Std 2553. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM2 Section 5A. Pages: 25

1st Edition | March 1991 | Reaffirmed: January 2014
Product Number: H30044 | Price: $59.00

Chapter 2.8A
Calibration of Tanks on Ships and Oceangoing Barges

Three methods for determining the total and incremental volumes of liquids in tanks, oceangoing barges, and integrated tug barge units that have integral hull tanks. The three methods include liquid calibration, calibration by linear measurement, and calibration from vessel drawings. This document and Ch. 2.7 supersede the previous Std 2553. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM2 Section 5B. Pages: 22

1st Edition | March 1991 | Reaffirmed: March 2012
Product Number: H30049 | Price: $89.00

Chapter 2.8B
Recommended Practice for the Establishment of the Location of the Reference Gauge Point and the Gauge Height of Tanks on Marine Tank Vessels

Recommended practice, for use in conjunction with Ch. 2.7 and Ch. 2.8A. Establishes reference gauge heights during calibration of marine tank vessels. A reference gauge point is necessary for converting ullage to innage, and when determining the volume of the quantities remaining on board. A reference gauge point is also used for wedge formulas and establishing wedge tables. Pages: 26

1st Edition | September 1995 | Reaffirmed: December 2014
Product Number: H028B1 | Price: $97.00

Chapter 3
Tank Gauging

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

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

Describes the following:

- the procedures for manually gauging the liquid level of petroleum and petroleum products in non-pressure fixed-roof, floating-roof tanks and marine tank vessels,
- procedures for manually gauging the level of free water that may be found with the petroleum or petroleum products,
- methods used to verify the length of gauge tapes under field conditions and the influence of bob weights and temperature on the gauge tape length, 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 | Product Number: H301A03 | Price: $100.00

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

Spanish translation of Ch. 3.1A.

3rd Edition | August 2013 | Product Number: H301A03S | Price: $100.00

Chapter 3.1B
Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Tanks by Automatic Tank Gauging

Covers level measurement of liquid hydrocarbons in stationary, aboveground, atmospheric storage tanks using automatic tank gauges (ATGs). This publication discusses automatic tank gauging in general, calibration of ATGs for custody transfer and inventory control, and the requirements for data collection, transmission, and receiving. The appendices discuss the operation and installation of the most commonly used ATG equipment and of the less commonly used, electronic ATGs. Pages: 17

2nd Edition | June 2001 | Reaffirmed: February 2016
Product Number: H301B2 | Price: $97.00

Chapter 3.1B *
Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Tanks by Automatic Tank Gauging—Spanish

Spanish translation of Ch. 3.1B.

2nd Edition | June 2001 | Product Number: H301B2SP | Price: $97.00

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: $97.00

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 | Product Number: H03021S | Price: $97.00

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: October 2011
Product Number: H03031 | Price: $83.00

Chapter 3.3 *■
Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Pressurized Storage Tanks by Automatic Tank Gauging—Spanish

Spanish translation of Ch. 3.3.

1st Edition | June 1996 | Product Number: H030316 | Price: $83.00

Chapter 3.4
Standard Practice for Level Measurement of Liquid Hydrocarbons on Marine Vessels by Automatic Tank Gauging

Provides guidance on the selection, installation, calibration, and verification of automatic tank gauges for measuring the level of liquid hydrocarbons having a Reid vapor pressure less than 15 psia (103 kPa), transported aboard marine vessels (tankers and barges). This standard also provides guidance on the requirements for data collection, transmission, and receiving. This standard supersedes all applicable sections of Std 2545. Pages: 10

1st Edition | April 1995 | Reaffirmed: May 2016
Product Number: H03041 | Price: $83.00

Chapter 3.4 *
Standard Practice for Level Measurement of Liquid Hydrocarbons on Marine Vessels by Automatic Tank Gauging—Spanish

Spanish translation of Ch. 3.4.

1st Edition | April 1995 | Product Number: H03041SP | Price: $83.00

Chapter 3.5
Standard Practice for Level Measurement of Light Hydrocarbon Liquids Onboard Marine Vessels by Automatic Tank Gauging

Covers the standard practice for level measurement of light hydrocarbon liquids onboard marine vessels by automatic tank gauges. This publication covers pressurized and refrigerated light hydrocarbon liquids. The light hydrocarbon liquids covered include: liquefied petroleum gas (LPG), natural gas liquid (NGL), and other petrochemical liquids where the storage and transportation requirements and the methods of measurement are similar to that for LPG and NGL gauging. This standard also covers the requirements for data collection, transmission, and receiving. Pages: 8

1st Edition | March 1997 | Reaffirmed: February 2013
Product Number: H03051 | Price: $83.00

Chapter 3.5 *
Standard Practice for Level Measurement of Light Hydrocarbon Liquids Onboard Marine Vessels by Automatic Tank Gauging—Spanish

Spanish translation of Ch. 3.5.

1st Edition | March 1997 | Product Number: H03051S | Price: $83.00

Chapter 3.6
Measurement of Liquid Hydrocarbons by Hybrid Tank Measurement Systems
(includes Errata 1 dated September 2005)

Covers selection, installation, commissioning, calibration, and verification of hybrid tank measurement systems for the measurement of level, static mass, observed and standard volume, and observed and reference density in tanks storing petroleum and petroleum products for custody transfer and/or inventory control purposes. Pages: 26

1st Edition | February 2001 | Reaffirmed: October 2011
Product Number: H03061 | Price: $96.00

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Chapter 4
Proving Systems

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

Chapter 4.1
Introduction

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

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

Chapter 4.1 *
Introduction—Spanish

Spanish translation of Ch. 4.1.

3rd Edition | February 2005 | Product Number: H40101S | Price: $82.00

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

Outlines the essential elements of provers that accumulate meter pulses as a displacing element within the prover travels between detector switches. It provides design and installation details for the types of displacement provers that are currently in use. The provers discussed are designed for proving measurement devices under dynamic operating conditions with single-phase liquid hydrocarbons. Pages: 45

3rd Edition | September 2003 | Reaffirmed: March 2011
Product Number: H04023 | Price: $123.00

Chapter 4.4
Tank Provers

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

2nd Edition | May 1998 | Reaffirmed: May 2015
Product Number: H04042 | Price: $83.00

Chapter 4.5 ■
Master Meter Provers

Covers the use of displacement, turbine, Coriolis, and ultrasonic meters as master meters. The requirements in this standard are intended for single-phase liquid hydrocarbons. Meter proving requirements for other fluids should be appropriate for the overall custody transfer accuracy and should be agreeable to the parties involved. This document does not cover master meters to be used for the calibration of provers. For information concerning master meter calibration of provers, see Ch. 4.9.3. Pages: 24

4th Edition | June 2016 | Product Number: H40504 | Price: $80.00

Chapter 4.6
Pulse Interpolation
(includes Errata 1 dated April 2007)

Describes how the double-chronometry method of pulse interpolation, including system operating requirements and equipment testing, is applied to meter proving. Pages: 8

2nd Edition | May 1999 | Reaffirmed: October 2013
Product Number: H04062 | Price: $65.00

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: $86.00

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: 40

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

Chapter 4.9.1
Methods of Calibration for Displacement and Volumetric Tank Provers, Part 1—Introduction to the Determination of the Volume of Displacement and Tank Provers

Provers are precision devices, defined as volumetric standards, which are used to verify the accuracy of liquid volumetric meters used for custody transfer measurement. Both displacement and tank provers are used to prove a meter in order to obtain its meter factor, which is then used to correct for meter error caused by differences between the metered volume and the true volume. The base volume of a displacement or tank prover, determined by calibration, is an essential requirement in the determination of these meter factors. The accuracy of a meter factor is limited by several considerations:

- equipment performance,
- observation errors,
- prover volume calibration errors,
- calculation errors. Pages: 28

1st Edition | October 2005 | Reaffirmed: April 2015
Product Number: H409011 | Price: $76.00

Chapter 4.9.2
Methods of Calibration for Displacement and Volumetric Tank Provers, Part 2—Determination of the Volume of Displacement and Tank Provers by the Waterdraw Method of Calibration

All prover volumes used to calibrate meters shall be determined by calibration and not by theoretical calculation. Volumetric provers have an exact reference volume, which has been determined by a recognized method of calibration. Techniques for the determination of this reference volume include the waterdraw, master meter, and gravimetric methods of calibration. This standard describes only the waterdraw method of calibration, which is used to accurately determine the calibrated volume of both displacement and tank provers. Pages: 92

1st Edition | December 2005 | Reaffirmed: May 2015
Product Number: H409021 | Price: $182.00

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

Covers the procedures required to determine the field data necessary to calculate a base prover volume (BPV) of a field displacement prover by the master meter method for calibration. This standard applies to liquids that for all practical purposes are considered to be clean, single-phase, homogeneous, and Newtonian at metering conditions.

Detailed calculation procedures are not included in this standard: see Ch. 12.2.5. Pages: 19

1st Edition | April 2010 | Reaffirmed: March 2015
Product Number: H409031 | Price: $74.00

Chapter 4.9.4
Methods of Calibration for Displacement and Volumetric Tank Provers, Part 4—Determination of the Volume of Displacement and Tank Provers by the Gravimetric Method of Calibration
(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: December 2015
Product Number: H4090401 | Price: $83.00

Chapter 5
Metering

Covers the dynamic measurement of liquid hydrocarbons, by means of meters and accessory equipment.

Chapter 5.1
General Considerations for Measurement by Meters
(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: July 2016
Product Number: H05014 | Price: $94.00

Chapter 5.1 *
General Considerations for Measurement by Meters—Spanish

Spanish translation of Ch. 5.1.

4th Edition | September 2005 | Product Number: H05014SP | Price: $94.00

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: July 2015
Product Number: H05023 | Price: $87.00

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

Spanish translation of Ch. 5.2.

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

Chapter 5.3
Measurement of Liquid Hydrocarbons by Turbine Meters
(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: $106.00

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

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

5th Edition | September 2005 | Product Number: H50305SP | Price: $106.00

Chapter 5.4
Accessory Equipment for Liquid Meters
(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: $94.00

Chapter 5.4 *
Accessory Equipment for Liquid Meters—Spanish

Spanish translation of Ch. 5.4.

4th Edition | September 2005 | Product Number: H05044SP | Price: $94.00

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: $70.00

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

Spanish translation of Ch. 5.5.

2nd Edition | July 2005 | Product Number: H50502SP | Price: $70.00

Chapter 5.6
Measurement of Liquid Hydrocarbons by Coriolis Meters (ANSI/API *MPMS* Ch. 5.6-2002)

Describes methods for achieving custody transfer levels of accuracy when a Coriolis meter is used to measure liquid hydrocarbons. Topics covered include: applicable API standards used in the operation of Coriolis meters; proving and verification using both mass- and volume-based methods; and installation, operation, and maintenance. Both mass and volume-based calculation procedures for proving and quantity determination are included in Appendix E. Pages: 48

1st Edition | October 2002 | Reaffirmed: November 2013
Product Number: H05061 | Price: $139.00

Chapter 5.6 *
Measurement of Liquid Hydrocarbons by Coriolis Meters—Spanish

Spanish translation of Ch. 5.6.

1st Edition | October 2002 | Product Number: H05061S | Price: $139.00

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 | Product Number: H050802 | Price: $86.00

Chapter 5.8 *
Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters—Spanish

Spanish translation of Ch. 5.8.

2nd Edition | November 2011 | Product Number: H050802SP | Price: $86.00

Chapter 6
Metering Assemblies

Discussion of the design, installation, and operation of metering systems for coping with special situations in hydrocarbon measurement.

Chapter 6.1
Lease Automatic Custody Transfer (LACT) Systems

Prepared as a guide for the design, installation, calibration, and operation of a lease automatic custody transfer (LACT) system. It applies to unattended and automatic measurement by meter of hydrocarbon liquids produced in the field and transferred to a pipeline in either a scheduled or nonscheduled operation. Pages: 6

2nd Edition | May 1991 | Reaffirmed: May 2012
Product Number: H30121 | Price: $60.00

Chapter 6.2
Loading Rack Metering Systems

Serves as a guide in the selection, installation, and operation of loading rack metering systems for petroleum products, including liquefied petroleum gas. This standard does not endorse or advocate the preferential use of any specific type of metering system or meter. Pages: 30

3rd Edition | February 2004 | Reaffirmed: July 2016
Product Number: H60203 | Price: $79.00

Chapter 6.2 *■
Loading Rack Metering Systems—Spanish

Spanish translation of Ch. 6.2.

3rd Edition | February 2004 | Product Number: H60203S | Price: $79.00

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: May 2012
Product Number: H30125 | Price: $65.00

Chapter 6.6
Pipeline Metering Systems

Provides guidelines for selection of the type and size of meters to be used to measure pipeline oil movements, as well as the relative advantages and disadvantages of the methods of proving meters by tank prover, conventional pipe prover, small volume prover, and master meter. It also includes discussion on obtaining the best operating results from a pipeline-meter station. Pages: 9

2nd Edition | May 1991 | Reaffirmed: January 2012
Product Number: H30126 | Price: $65.00

Chapter 6.7
Metering Viscous Hydrocarbons

Serves as a guide for the design, installation, operation, and proving of meters and auxiliary equipment used in metering viscous hydrocarbons. It defines viscous hydrocarbons and describes the difficulties that arise when viscous hydrocarbons are raised to high temperature. The effects of such temperatures on meters, auxiliary equipment, and fittings are discussed, and advice and warnings to overcome or mitigate difficulties are included. Pages: 6

2nd Edition | May 1991 | Reaffirmed: May 2012
Product Number: H30127 | Price: $65.00

Chapter 7
Temperature Determination (includes Addendum 1 dated October 2011)

Describes methods and practices that may be used to obtain accurate measurements of temperature of petroleum and petroleum products in pipelines, storage tanks, gathering tanks, ships, barges, tank cars, pipe provers, tank provers, and test measures under both static and dynamic conditions using electronic temperature measuring devices or mercury-in-glass thermometers.

Describes the methods, equipment, and procedures for determining the temperature of petroleum and petroleum products under both static and dynamic conditions. This chapter discusses temperature measurement requirements in general for custody transfer, inventory control, and marine measurements. The actual method and equipment selected for temperature determination are left to the agreement of the parties involved. Pages: 38

1st Edition | June 2001 | Reaffirmed: February 2012
Product Number: H07001 | Price: $197.00

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Chapter 7.3
Temperature Determination—Fixed Automatic Tank Temperature Systems

Describes the methods, equipment, and procedures for determining the temperature of petroleum and petroleum products under static conditions by the use of an automatic method. Automatic temperature measurement is discussed for custody transfer and inventory control for both onshore and marine measurement applications.

Temperatures of hydrocarbon liquids under static conditions can be determined by measuring the temperature of the liquid at specific locations. Examples of where static temperature determination is required include storage tanks, ships, and barges.

The application of this standard is restricted to automatic methods for the determination of temperature using fixed automatic tank thermometer (ATT) systems for hydrocarbons having a Reid vapor pressure at or below 101.325 kPa (14.696 psia).

Although not included in the scope, requirements in this standard can be used for other fluids and other applications including petroleum liquids having Reid vapor pressures in excess of 101.325 kPa (14.696 psia) tanks with inert gas systems and cryogenic liquids. However, such applications can require different performance and installation specifications. Pages: 27

2nd Edition | October 2011 | Reaffirmed: December 2016
Product Number: H70302 | Price: $83.00

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

Spanish translation of Ch. 7.3.

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

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

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

1st Edition | September 2014 | Product Number: HH70501 | Price: $95.00

Chapter 8
Sampling

Covers standardized procedures for sampling crude oil or its products.

Chapter 8.1
Standard Practice for Manual Sampling of Petroleum and Petroleum Products
(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. Procedures are also included for the sampling of free water and other heavy components associated with petroleum and petroleum products. This practice also addresses the sampling of semi-liquid or solid-state petroleum products. This practice provides additional specific information about sample container selection, preparation, and sample handling. This practice does not cover sampling of electrical insulating oils and hydraulic fluids. The procedures described in this practice may also be applicable in sampling most non-corrosive liquid industrial chemicals provided that all safety precautions specific to these chemicals are followed (also, refer to ASTM Practice E300). The procedures described in this practice are also applicable to sampling liquefied petroleum gases and chemicals. Pages: 48

4th Edition | October 2013 | Product Number: H80104 | Price: $120.00

Chapter 8.2 ■
Standard Practice for Automatic Sampling of Petroleum and Petroleum Products
(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. If sampling is for the precise determination of volatility, use Ch. 8.4 (ASTM Practice D5842) in conjunction with this practice. For sample mixing and handling, refer to Ch. 8.3 (ASTM Practice D5854). This practice does not cover sampling of electrical insulating oils and hydraulic fluids. Pages: 45

4th Edition | November 2016 | Product Number: H80204 | Price: $71.00

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

Covers the handling, mixing, and conditioning procedures required to ensure that a representative sample of the liquid petroleum or petroleum product is delivered from the primary sample container/receiver into the analytical test apparatus or into intermediate containers. For sampling procedures, refer to Ch. 8.1 and Ch. 8.2. Refer to Ch. 8.4 for the mixing and handling of light fuels for volatility measurement. Pages: 27

1st Edition | October 1995 | Reaffirmed: March 2015
Product Number: H08031 | Price: $89.00

Chapter 8.3 *
Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products—Spanish

Spanish translation of Ch. 8.3.

1st Edition | October 1995 | Product Number: H80301SP | Price: $89.00

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

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

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

3rd Edition | March 2014 | Product Number: H80403 | Price: $41.00

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

Chapter 8.5
Standard Practice for Manual Piston Cylinder Sampling for 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) as described in ASTM D3700. Pages: 20

1st Edition | December 2015 | Product Number: H80501 | Price: $50.00

Chapter 9
Density Determination

Describes the standard methods and apparatus used to determine the specific gravity of crude oil and petroleum products normally handled as liquids.

Chapter 9.1
Standard Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
(ASTM D1298)

Covers the laboratory determination, using a glass hydrometer in conjunction with a series of calculations, of the density, relative density, or API gravity of crude petroleum, petroleum products, or mixtures of petroleum and nonpetroleum products normally handled as liquids and having a Reid vapor pressure of 101.325 kPa (14.696 psi) or less. Values are determined at existing temperatures and corrected to 15 °C or 60 °F by means of a series of calculations and international standard tables.

The initial hydrometer readings obtained are uncorrected hydrometer readings and not density measurements. Readings are measured on a hydrometer at either the reference temperature or at another convenient temperature, and readings are corrected for the meniscus effect, the thermal glass expansion effect, alternate calibration temperature effects, and to the reference temperature by means of volume correction factors; values obtained at other than the reference temperature being hydrometer readings and not density measurements.

Readings determined as density, relative density, or API gravity can be converted to equivalent values in the other units or alternate reference temperatures by means of Interconversion Procedures (Ch. 11.5) or volume correction factors (Ch. 11.1), or both, or tables, as applicable. Pages: 8

3rd Edition | December 2012 | Product Number: H09013 | Price: $41.00

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).

The prescribed apparatus should not be used for materials having vapor pressures higher than 1.4 MPa (200 psi) at the test temperature. This pressure limit is dictated by the type of equipment. Higher pressures can apply to other equipment designs.

The initial pressure hydrometer readings obtained are uncorrected hydrometer readings and not density measurements. Readings are measured on a hydrometer at either the reference temperature or at another convenient temperature, and readings are corrected for the meniscus effect, the thermal glass expansion effect, alternate calibration temperature effects, and to the reference temperature by means of calculations and volume correction factors (Ch. 11.1) or Ch. 11.2.4 (GPA TP-27), as applicable.

Values determined as density or relative density can be converted to equivalent values in the other units or alternative reference temperatures by means of Interconversion Procedures (Ch. 11.5), or volume correction factors (Ch. 11.1) or Ch. 11.2.4 (GPA TP-27), as applicable. Pages: 6

3rd Edition | December 2012 | Product Number: H09023 | Price: $41.00

Chapter 9.3
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 in conjunction with a series of calculations, of the density, relative density, or API gravity of crude petroleum, petroleum products, or mixtures of petroleum and nonpetroleum products normally handled as liquids and having a Reid vapor pressures of 101.325 kPa (14.696 psi) or less.

Values are determined at existing temperatures and corrected to 15 °C or 60 °F by means of a series of calculations and international standard tables.

The initial thermohydrometer readings obtained are uncorrected hydrometer readings and not density measurements. Readings are measured on a thermohydrometer at either the reference temperature or at another convenient temperature, and readings are corrected for the meniscus effect, the thermal glass expansion effect, alternate calibration temperature effects, and to the reference temperature by means of calculations and volume correction factors (Ch. 11.1).

Readings determined as density, relative density, or API gravity can be converted to equivalent values in the other units or alternate reference temperatures by means of Interconversion Procedures (Ch. 11.5) or volume correction factors (Ch. 11.1), or both, or tables, as applicable. Pages: 10

3rd Edition | December 2012 | Product Number: H09033 | Price: $41.00

Chapter 10
Sediment and Water

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

Chapter 10.1
Standard Test Method for Sediment in Crude Oils and Fuel Oils by the Extraction Method
(ANSI/ASTM D473)

Covers the determination of sediment in crude oils and fuel oils by extraction with toluene. The precision applies to a range of sediment levels from 0.01 to 0.40 % mass, although higher levels may be determined. Pages: 6

3rd Edition | November 2007 | Reaffirmed: October 2012
Product Number: H10013 | Price: $39.00

Chapter 10.2 ■
Standard Test Method of Water in Crude Oil by Distillation
(ASTM D4006)

Covers the determination of water in crude oil by distillation. Pages: 11

4th Edition | December 2016 | Product Number: H100204 | Price: $50.00

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

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

4th Edition | August 2013 | Reaffirmed: May 2016
Product Number: H100304 | Price: $50.00

Chapter 10.4
Determination of Water and/or Sediment in Crude Oil by the Centrifuge Method (Field Procedure)
(includes Errata 1 dated March 2015)

Describes the field centrifuge method for determining both water and sediment or sediment only in crude oil. This method may not always

produce the most accurate results, but it is considered the most practical method for field determination of water and sediment. This method may also be used for field determination of sediment. Pages: 23

4th Edition | October 2013 | Product Number: H100404 | Price: $85.00

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 % volume in petroleum products, tars, and other bituminous materials by the distillation method. Volatile water-soluble material, if present, may be measured as water. The specific products considered during the development of this test method were asphalt, bitumen, tar, fuel oil, lubricating oil, lubricating oil additives, and greases. For bituminous emulsions refer to ASTM Test Method D244. For crude oils, refer to Ch. 10.2. Pages: 6

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

Chapter 10.6
Standard Test Method for Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure)
(ASTM D1796)

Describes the laboratory determination of water and sediment in fuel oils in the range from 0 to 30 % volume by means of the centrifuge procedure. Note that with some types of fuel oils such as residual fuel oils or distillate fuel oils containing residual components, it is difficult to obtain water or sediment contents with this test method. When this situation is encountered, Ch. 10.5 or Ch. 10.1 may be used. Pages: 7

5th Edition | August 2013 | Reaffirmed: May 2016
Product Number: H100605 | Price: $41.00

Chapter 10.7
Standard Test Method for Water in Crude Oils by Potentiometric Karl Fischer Titration
(ANSI/ASTM D4377)

Describes the procedure for the determination of water in crude oils by Karl Fischer titration (potentiometric). This test method covers the determination of water in the range from 0.02 to 2 mass percent in crude oils. Mercaptan and sulfide (S^- or H_2S) sulfur are known to interfere with the method. Pages: 6

2nd Edition | December 2002 | Reaffirmed: May 2011
Product Number: H10072 | Price: $39.00

Chapter 10.8
Standard Test Method for Sediment in Crude Oil by Membrane Filtration
(ANSI/ASTM D4807)

Covers the determination of sediment in crude oils by membrane filtration. This test method has been validated for crude oils with sediments up to approximately 0.15 mass %. The accepted unit of measure for this test method is mass %, but an equation to convert to volume % is provided. Pages: 5

2nd Edition | November 2005 | Reaffirmed: March 2015
Product Number: H100802 | Price: $39.00

Chapter 10.9
Standard Test Method for Water in Crude Oils by Coulometric Karl Fischer Titration
(ASTM D4928)

Covers the determination of water in the range from 0.02 to 5.00 mass or volume % in crude oils. Mercaptan (RSH) and sulfide (S^- or 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 can be used to determine water in the 0.005 to 0.02 mass % range, but the effects of the mercaptan and sulfide interference at these levels has not been determined. For the range 0.005 to 0.02 mass %, there is no precision or bias statement. This test method is intended for use with standard commercially available coulometric Karl Fischer reagent. Pages: 6

3rd Edition | May 2013 | Product Number: H10093 | Price: $41.00

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

Spanish translation of Ch. 10.9.

3rd Edition | May 2013 | Product Number: H100903SP | Price: $41.00

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: $73.00

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 | Product Number: H257301 | Price: $41.00

Chapter 11
Physical Properties Data (Volume Correction Factors)

Ch. 11 is the physical data that has direct application to volumetric measurement of liquid hydrocarbons. It is presented in 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)
(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.

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

An API 11.1 VCF Application for calculating VCF is also available. This Windows-based standalone application allows users to calculate volumes and densities at observed (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 online via the Flow-Cal website (flowcal.com/api-standards/). You may also contact Flow-Cal, Inc. at +1 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

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

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

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

Chapter 11.1
Add-In Program for Microsoft® Excel

A Microsoft® Windows compatible 32-bit add-in for Microsoft® Excel that provides callable functions for density, correction for temperature and pressure of a liquid (CTPL), and compressibility coefficient (Fp). These functions allow calculating density at base conditions or at alternate conditions, CTPL correction factor used to transform volume and density data to base or desired conditions, and the scaled compensation factor for transformation from alternate to base conditions or from observed to base conditions for generalized crude oils, refined products and lubricating oils. They support the following process variables: density (API gravity, relative density, and kg/m^3), temperature (°F and °C), and pressure (psig, bar, and kPa).

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

XL Add-In—runs on a single standalone computer with no network access
Price: $750.00

XL Add-In—installed on less than 15 standalone computers or ran on a network with less than 15 nodes | Price: $5,000.00

XL Add-In—installed on less than 50 standalone computers or ran on a network with less than 50 nodes | Price: $7,500.00

XL Add-In—installed on an unlimited number of standalone computers or ran on a network with unlimited nodes | Price: $11,000.00

Chapter 11.1
Dynamic Link Library (DLL)

The DLL is compiled from source code written in the C programming language. The DLL provides subroutines that can be called from applications written in C or other programming languages. These subroutines are subdivided into three groups (density, volume correction factors, and scaled compressibility factor) for generalized crude oils, refined products, and lubricating oils.

- The density subroutines have two sets of density functions allowing calculations at base conditions or at alternate conditions.
- The volume correction factor subroutines calculate a correction for 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 the DLL, contact Flow-Cal, Inc. at +1 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

DLL—installed on less than 50 standalone computers or ran on a network with less than 50 nodes | Price $15,000.00

DLL—installed on an unlimited number of standalone computers or ran on a network with unlimited nodes | Price $20,000.00

DLL—compiled as part of an application for distribution (software distributor) Price: $30,000.00

Chapter 11.1
Source Code

ANSI C-Code used to compile the 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 the C-Code Subroutines, contact Flow-Cal, Inc. at +1 (281) 282-0865 or send an e-mail to APIstandards@flowcal.com.

C-Code—compiled to run on a network with less than 50 nodes
Price: $22,500

C-Code—compiled to run on a network with unlimited nodes
Price: $30,000

C-Code—compiled as part of an application for distribution (software distributor) | Price: $45,000

Chapter 11.1
Source Code, DLL & XL Add-In—Combined

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

C-Code, DLL, and XL Add-In—compiled to run on a network with less than 50 nodes | Price: $27,500

C-Code, DLL, and XL Add-In—compiled to run on a network with unlimited nodes | Price: $37,000

C-Code, DLL, and XL Add-In—compiled as part of an application for distribution (software distributor) | Price: $55,000

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: $296.00

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: December 2012
Product Number: H27307 | Price: $171.00

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

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

1st Edition | October 1986 | Reaffirmed: December 2012
Product Number: H27309 | Price: $171.00

Chapter 11.2.4
Temperature Correction for the Volume of NGL and LPG Tables 23E, 24E, 53E, 54E, 59E, 60E
(includes Errata 1 dated September 2011)

This publication is an updated version of TP-25. The actual standard represented by this report consists of the explicit implementation procedures. Sample tables, flow charts, and specific examples created from a computerized version of these implementation procedures are included. The examples are to provide guides and checkpoints for those who wish to implement a computerized procedure to represent the standard; however, these are not part of the actual standard.

This standard covers a 60 °F relative density range of 0.3500 to 0.6880, which nominally equates to a density at 15 °C of 351.7 to 687.8 kg/m^3 and a density at 20 °C of 331.7 to 686.6 kg/m^3. The temperature range of this standard is 50.8 to 199.4 °F (–46 to 93 °C). At all conditions, the pressure is assumed to be at saturation conditions (also known as bubble point or saturation vapor pressure). Pages: 149

1st Edition | September 2007 | Reaffirmed: October 2012
Product Number: H1102041 | Price: $180.00

Chapter 11.2.5
A Simplified Vapor Pressure Correlation for Commercial NGLs
(supersedes the Addendum to Ch. 11.2.2–1994)

Methods used for calculation of the correction factor for pressure effects such as Ch. 11.2.1-1984 (now superseded by Ch. 11.1-2004) and Ch. 11.2.2-1986 require knowledge of the equilibrium bubble point pressure (vapor pressure) at the measured conditions.

However, the vapor pressure of the process liquid is generally not measured. The vapor pressure can also be calculated form compositional information, but the composition is not always measured for natural gas liquids (NGLs). Therefore, a correlation for the vapor pressure of NGLs is based upon normally measured properties is required and is documented in this publication. Pages: 27

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

Chapter 11.3.2.1
Ethylene Density

Identifies an equation of state (EOS) suitable for use in custody transfer measurement of pure ethylene (>99 %) in the gaseous, liquid, and 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: $60.00

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. 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. Pages: 16

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

Chapter 11.3.3.2
Propylene Compressibility

An electronic FORTRAN Source Code text file on CD-ROM that will produce a table of values applicable to liquid propylene in the following ranges: temperature, 30 °F to 165 °F, and saturation pressure to 1600 psia. It computes the following two values: density (pounds per cubic foot) at flowing temperature and pressure, and ratio of density at flowing conditions to density at 60 °F and saturation pressure. A documentation file is also included.

January 1974 | Reaffirmed: July 2012
Product Number: H25656 | Price: $296.00

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

Specifies the density of water to be used in all applicable API *MPMS* standards. It also specifies the volume correction factor equation for water and demonstrates its use for water calibration of volumetric provers. Pages: 14

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

Chapter 11.5
Density/Weight/Volume Intraconversion
[includes Errata 1 dated September 2011 (updated September 2013)]
[replaces Ch. 11.1–1980 Volumes XI/XII (ASTM D1250-80, IP 200/80)]

These intraconversion tables are applicable to all crude oils, petroleum products, and petrochemicals. These standards are intended for application to bulk liquid quantities. Ch. 11.5, Parts 1 to 3 are available collectively on one CD-ROM.

1st Edition | March 2009 | Reaffirmed: March 2015
Product Number: H1105CD | Price: $248.00

Chapter 11.5.1
Part 1—Conversions of API Gravity at 60 °F

Provides implementation procedures for conversion of API gravity at 60 °F to equivalent densities in both in vacuo and in air values. This standard gives the following equivalents for any value of API gravity at 60 °F:

- relative density at 60 °F (old Table 3);
- absolute density at 60 °F;
- absolute density at 15 °C (old Table 3);
- pounds per U.S. gallon at 60 °F in vacuo and in air (old Table 8);
- U.S. gallons per pound at 60 °F in vacuo and in air (old Table 8);
- short tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 9);
- U.S. gallons per short ton at 60 °F in vacuo and in air (old Table 10);
- short tons per barrel at 60 °F in vacuo and in air (old Table 9);
- barrels per short ton at 60 °F in vacuo and in air (old Table 10);
- long tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 11);
- U.S. gallons per long ton at 60 °F in vacuo and in air (old Table 12);
- long tons per barrel at 60 °F in vacuo and in air (old Table 11);
- barrels per long ton at 60 °F in vacuo and in air (old Table 12);
- metric tons per 1000 U.S. gallons at 60 °F in vacuo and in air (old Table 13);
- metric tons per barrel at 60 °F in vacuo and in air (old Table 13);
- barrels per metric ton at 60 °F in vacuo and in air;
- cubic metres per short ton at 15 °C in vacuo and in air (old Table 14);
- cubic metres per long ton at 15 °C in vacuo and in air (old Table 14).

While not related to API gravity, the following are included for user convenience:

- U.S. gallons at 60 °F to litres at 15 °C (old Table 4);
- barrels at 60 °F to litres at 15 °C (old Table 4).

Chapter 11.5.2
Part 2—Conversions for Relative Density (60/60 °F)

Provides implementation procedures for conversion of relative density (60/60 °F) to equivalent densities in both in vacuo and in air values. This standard gives the following equivalents for any value of relative density (60/60 °F):

- API gravity at 60 °F (old Table 21);
- absolute density at 60 °F;
- absolute density at 15 °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);
- 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
(includes Errata 1 dated May 2015)

Guides the user through the steps necessary to calculate static liquid quantities, at atmospheric conditions, in upright, cylindrical tanks and marine tank vessels. The standard defines terms employed in the calculation of static petroleum quantities. The standard also specifies equations that allow the values of some correction factors to be computed. Fundamental to this process is the understanding that in order for different parties to be able to reconcile volumes, they must start with the same basic information (tank capacity table, levels, temperatures, and so forth) regardless of whether the information is gathered automatically or manually. This standard does not address the calculation of clingage, nonliquid material, small quantities (such as onboard quantities, quantities remaining on board, and wedge formula, where material is not touching all bulkheads on marine vessels), and vapor space calculations. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM1 Part 1. Pages: 40

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

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

Chapter 12.1.1 *

Calculation of Static Petroleum Quantities, Part 1—Upright Cylindrical Tanks and Marine Vessels—Spanish

Spanish translation of Ch. 12.1.1.

3rd Edition | April 2012 | Product Number: H1201013SP | Price: $114.00

Chapter 12.1.2

Calculation of Static Petroleum Quantities, Part 2—Calculation Procedures for Tank Cars
(includes Ch. 12 Addendum 1 dated August 2007)

Describes the standardized method for calculating target loading quantities and actual loading quantities of liquids in tank cars. Also explained are the factors required for the calculations. This information is applicable to all crude oils, petroleum products, and petrochemicals (including LPGs and other liquefied gases) transported by rail tank car. It does not cover any products loaded or measured as solids. It defines the terms required to understand the calculations, and provides instructions for their use; includes 13 calculation examples in Appendix E. Pages: 39

1st Edition | May 2003 | Reaffirmed: May 2011
2-Year Extension: March 2016 | Product Number: H12121 | Price: $111.00

Chapter 12.1.2 *

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

Spanish translation of Ch. 12.1.2.

1st Edition | May 2003 | Product Number: H12121S | Price: $111.00

Chapter 12.2.1

Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 1—Introduction
(includes Ch. 12 Addendum 1 dated August 2007 and Errata 1 dated July 2009)

Provides the general introduction of this standard, which is divided into five parts, each published separately. The base (reference or standard) volumetric determination of metered quantities is discussed along with the general terms required for solution of the various equations. General rules for rounding of numbers, including field data, intermediate calculations numbers, and discrimination levels, are specified. Pages: 23

2nd Edition | May 1995 | Reaffirmed: March 2014
Product Number: H12021 | Price: $109.00

Chapter 12.2.2

Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 2—Measurement Tickets
(includes Ch. 12 Addendum 1 dated August 2007)

Provides standardized calculation methods for the quantification of liquids and the determination of base prover volumes under defined conditions, regardless of the point of origin or destination or the units of measure required by governmental customs or statute. The publication rigorously specifies the equations for computing correction factors, rules for rounding, calculational sequence, and discrimination levels to be employed in the calculations. Pages: 18

3rd Edition | June 2003 | Reaffirmed: February 2016
Product Number: H12223 | Price: $101.00

Chapter 12.2.3

Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 3—Proving Reports
(includes Ch. 12 Addendum 1 dated August 2007)

Consolidates and standardizes calculations for metering petroleum liquids using turbine or displacement meters and clarifies terms and expressions by eliminating local variations among terms. This standard provides calculation methods for the determination of meter factors under defined conditions, regardless of the point of origin or destination or units of measure required by governmental customs or statute. This document specifies the equations for computing correction factors, including the calculation sequence, discrimination levels, and rules for rounding. Pages: 59

1st Edition | October 1998 | Reaffirmed: May 2014
Product Number: H12023 | Price: $119.00

Chapter 12.2.4

Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 4—Calculation of Base Prover Volumes by Waterdraw Method
(includes Ch. 12 Addendum 1 dated August 2007 and Errata 1 dated July 2009)

Provides a standardized calculation method to determine a base prover volume under defined conditions. Specifically, this standard discusses the calculation procedures for the waterdraw calibration method, which is one of several different procedures used to determine base prover volume (BPV) of a displacement prover. Pages: 58

1st Edition | December 1997 | Reaffirmed: September 2014
Product Number: H12024 | Price: $122.00

Chapter 12.2.5

Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 5—Base Prover Volume Using Master Meter Method
(includes Ch. 12 Addendum 1 dated August 2007 and Errata 1 dated July 2009)

Provides standardized calculation methods for the quantification of liquids and the determination of base prover volumes under defined conditions, regardless of the point of origin or destination or units of measure required by governmental customs or statute. The criteria contained in this document allow different entities using various computer languages on different computer hardware (or manual calculations) to arrive at identical results using the same standardized input data. Pages: 108

1st Edition | September 2001 | Reaffirmed: August 2016
Product Number: H12025 | Price: $170.00

Chapter 12.3

Calculation of Volumetric Shrinkage from Blending Light Hydrocarbons with Crude Oils
(includes Ch. 12 Addendum 1 dated August 2007)

Provides background, theory, calculation examples, and tables to correct for volumetric shrinkage resulting when blending volatile hydrocarbons with crude oil. The tables are entered with density differentials at standard conditions and percentage light hydrocarbon in total mix. This standard supersedes and replaces Bull 2509C, 2nd Edition, 1967. Pages: 110

1st Edition | July 1996 | Reaffirmed: April 2011
Product Number: H12031 | Price: $89.00

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Chapter 13
Statistical Aspects of Measuring and Sampling

The more accurate petroleum measurement becomes, the more its practitioners stand in need of statistical methods to express residual uncertainties. This chapter covers the application of statistical methods to petroleum measurement and sampling.

Chapter 13.1
Statistical Concepts and Procedures in Measurement
(includes Errata 1 dated July 2013)

Designed to help those who make measurement of bulk oil quantities improve the value of their result statement by making proper estimates of the uncertainty or probable error involved in measurements. Pages: 17

1st Edition | June 1985 | Reaffirmed: March 2016
Product Number: H30321 | Price: $83.00

Chapter 13.1 *
Statistical Concepts and Procedures in Measurement—Spanish

Spanish translation of Ch. 13.1.

1st Edition | June 1985 | Product Number: H130101SP | Price: $83.00

Chapter 13.2
Methods of Evaluating Meter Proving Data
(includes Errata 1 dated October 2015)

Addresses procedures for evaluating any meter's performance where meter proving factors are developed in accordance with Ch. 12.2. The data in examples used in this chapter are intended to be typical of custody transfer operations of low-vapor-pressure fluids using displacement or turbine meters in accordance with Ch. 4, Ch. 5, and Ch. 6. However, the procedures in Ch. 13.2 can be used for noncustody transfer metering applications and for custody transfer metering of high-vapor-pressure and gaseous fluids where meter proving data are available. Pages: 41

1st Edition | November 1994 | Reaffirmed: April 2016
Product Number: H13021 | Price: $97.00

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. Pages: 64

1st Edition | May 2016 | Product Number: H130301 | Price: $103.00

Chapter 14
Natural Gas Fluids Measurement

Standardizes practices for measuring, sampling, and testing natural gas fluids.

Chapter 14.1 ■
Collecting and Handling of Natural Gas Samples for Custody Transfer

Concentrates on proper sampling systems and procedures. It recognizes the critical impact of hydrocarbon dew point consideration to the overall accuracy and success of these practices and procedures. Analyses of gas samples are used for many purposes and are applied to various calculations, some of which have an impact on the accuracy of custody transfer calculations (quantity and quality). Pages: 76

7th Edition | May 2016 | Product Number: H140107 | Price: $209.00

Chapter 14.2
Compressibility Factors of Natural Gas and Other Related Hydrocarbon Gases
(AGA Report No. 8)(GPA 8185-90)

Presents detailed information for precise computations of compressibility factors and densities for natural gas and other hydrocarbon gases. Also included are calculation uncertainty estimations and FORTRAN computer program listings.

2nd Edition | July 1994 | Reaffirmed: February 2012
2-Year Extension: October 2016
Order from American Gas Association, 400 N. Capitol Street NW, Washington, DC 20001 | 202-824-7000

Chapter 14.3.1
Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids—Concentric Square-Edged Orifice Meters, Part 1: General Equations and Uncertainty Guidelines
(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 | Product Number: H1403014 | Price: $181.00

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)

Outlines the specification and installation requirements for the measurement of single-phase, homogeneous Newtonian fluids using concentric, square-edged, flange-tapped orifice meters. It provides specifications for the construction and installation of orifice plates, meter tubes, and associated fittings when designing metering facilities using orifice meters. Pages: 74

5th Edition | March 2016 | Product Number: H1403025 | Price: $188.00

Chapter 14.3.3
Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids—Concentric, Square-Edged Orifice Meters, Part 3: Natural Gas Applications
(ANSI/API *MPMS* Ch. 14.3.3-2013) (AGA Report No. 3, Part 3)

Developed as an application guide for the calculation of natural gas flow through a flange-tapped, concentric orifice meter, using the U.S. customary (USC) inch-pound system of units. It also provides practical guidelines for applying Ch. 14.3, Parts 1 and 2, to the measurement of natural gas. Pages: 54

4th Edition | November 2013 | Product Number: H1403034 | Price: $220.00

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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 Procedures and Subroutine Documentation
(AGA Report No. 3, Part 4) (GPA 8185, Part 4)

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

3rd Edition | November 1992 | Reaffirmed: August 2011
2-Year Extension: March 2016 | Product Number: H30354 | Price: $164.00

Chapter 14.4
Converting Mass of Natural Gas Liquids and Vapors to Equivalent Liquid Volumes
(GPA 8173-91)

Prescribes a method for converting the measured mass of natural gas liquids or natural gas vapors at operating conditions to equivalent liquid volume of the components at 60 °F and equivalent liquid volumes of the components at 15 °C and equilibrium pressure for SI units. Pages: 3

1st Edition | April 1991 | Reaffirmed: January 2012
2-Year Extension: October 2016 | Product Number: H30344 | Price: $59.00

Chapter 14.5
Calculation of Gross Heating Value, Relative Density, Compressibility and Theoretical Hydrocarbon Liquid Content for Natural Gas Mixtures for Custody Transfer
(GPA 2172-09)

Presents procedures for calculating, at base conditions from composition, the following properties of natural gas mixtures: gross heating value, relative density (real and ideal), compressibility factor, and theoretical hydrocarbon liquid content, which in the U.S. is typically expressed as GPM, the abbreviation for gallons of liquid per thousand cubic feet of gas.

Rigorous calculation of the effect of water upon these calculations is complicated. Because this document relates primarily to custody transfer, the water effect included is an acceptable contractual calculation. Annex A of this standard contains a detailed investigation of the effect of water and detailed derivations of the equations presented in the standard. Pages: 41

3rd Edition | January 2009 | Reaffirmed: February 2014
Product Number: H140503 | Price: $73.00

Chapter 14.6
Continuous Density Measurement
(includes Errata 1 dated August 1998)

Provides criteria and procedures for designing, installing, and operating continuous density measurement systems for Newtonian fluids in the petroleum, chemical, and natural gas industries. The application of this standard is limited to clean, homogeneous, single-phase liquids or supercritical fluids. The procedures and criteria in this standard have been successfully applied to fluids whose flowing density is greater than 0.3 g/cm^3 at operating conditions of 60 °F (15.6 °C) and saturation pressure. The intent of the standard is to provide the user with a density accuracy of 0.10 % for most applications. The errata provides editorial clarification regarding conversion factors and variables used in various calculation equations. Pages: 51

2nd Edition | April 1991 | Reaffirmed: February 2012
Product Number: H30346 | Price: $132.00

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

Serves as a reference for the selection, design, installation, operation, and maintenance of single-phase dynamic liquid mass measurement systems that operate in the 350 to 688 kg/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: 8

4th Edition | April 2012 | Product Number: H140704 | Price: $65.00

Chapter 14.8
Liquefied Petroleum Gas Measurement

Describes dynamic and static metering systems used to measure liquefied petroleum gas in the density range of 0.30 to 0.70 g/cm^3 This edition revises the February 1983 version of the standard to incorporate the 1992 version of the Ch. 14.3 orifice meter discharge coefficient equation and revises and simplifies the mass flow rate sample calculations. Pages: 20

2nd Edition | July 1997 | Reaffirmed: October 2011
2-Year Extension: October 2016 | Product Number: H14082 | Price: $97.00

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

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

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

Chapter 14.10
Measurement of Flow to Flares

Addresses measurement of flow to flares and includes:

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

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

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

Chapter 15
Guidelines for the Use of the International System of Units (SI) in the Petroleum and Allied Industries

Specifies the API preferred units for quantities involved in petroleum industry measurements and indicates factors for conversion of quantities expressed in customary units to the API-preferred metric units. The quantities that comprise the tables are grouped into convenient categories related to their use. They were chosen to meet the needs of the many and varied aspects of the petroleum industry but also should be useful in similar process industries. Pages: 43

3rd Edition | December 2001 | Reaffirmed: February 2015
Product Number: H15003 | Price: $115.00

Chapter 16
Measurement of Hydrocarbon Fluids by Weight or Mass

Covers the static and dynamic measurement of hydrocarbon fluids by weight or mass.

Chapter 16.2
Mass Measurement of Liquid Hydrocarbons in Vertical Cylindrical Storage Tanks by Hydrostatic Tank Gauging

Provides guidance on the installation, commissioning, maintenance, validation, and calibration of hydrostatic tank gauging systems for the direct measurement of static mass of liquid hydrocarbons in storage tanks. This edition is applicable to hydrostatic tank gauging systems that use pressure sensors with one port open to the atmosphere. It is also applicable for use on vertical cylindrical atmospheric storage tanks with either fixed or floating roofs. Pages: 20

1st Edition | November 1994 | Reaffirmed: March 2012
Product Number: H16021 | Price: $97.00

Chapter 17
Marine Measurement

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

Chapter 17.1
Guidelines for Marine Inspection

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

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

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

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

6th Edition | June 2014 | 2-Year Extension: May 2016
Product Number: H170106 | Price: $150.00

Chapter 17.2
Measurement of Cargoes On Board Tank Vessels
(includes Errata 1 dated April 2000)

Covers manual portable measurement units through deck-fitted vapor control valves and fixed automatic tank gauge systems for use when a marine vessel's cargo tanks may not be open to the atmosphere. It establishes the procedures for obtaining the level measurements of cargo, free water, and onboard quantity/remaining onboard (OBQ/ROB), as well as taking the temperatures and samples required for the marine custody transfer of bulk liquid petroleum cargoes under closed or restricted system measurement conditions. This standard is not intended for use with pressurized or refrigerated cargoes such as LPG and LNG. Pages: 19

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

Chapter 17.2 *
Measurement of Cargoes On Board Tank Vessels—Spanish

Spanish translation of Ch. 17.2.

2nd Edition | May 1999 | Product Number: H1702SP | Price: $132.00

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

Provides guidelines for identifying the source of free waters associated with marine petroleum cargo movements. The presence of free water is a factor in marine custody transfers of bulk petroleum, especially in the case of crude oil cargoes. This standard recommends the water samples and volumes to be taken, the containers to be used, the care and distribution of the samples, and the analytical procedures of use in identifying sources of free water associated with marine petroleum cargoes. Pages: 29

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

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

Provides a method for determining the small volumes of on board quantity prior to loading a vessel or material remaining on board a vessel upon completion of discharge. This standard applies only to quantification by manual gauging of small volumes on marine vessels prior to loading or upon completion of discharge. It does not address clingage, hydrocarbon vapors, cargoes in transit, or cargo pumpability. Refer to Ch. 3. Pages: 25

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

Chapter 17.5
Guidelines for Voyage Analysis and Reconciliation of Cargo Quantities

Covers guidelines for the reconciliation of marine cargo quantities. These guidelines are intended to provide a basis for analyzing and reconciling the quantity differences (gains/losses) resulting from marine custody transfer movement(s) of petroleum and petroleum product cargoes. As such, the guidelines are complementary to, but do not replace, normal inspection procedures. The purchase of this document includes an Excel® spreadsheet for determining voyage analysis and reconciliation of cargo quantities. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM64. Pages: 39

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

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

Spanish translation of Ch. 17.5.

3rd Edition | April 2012 | Product Number: H170503SP | Price: $145.00

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. It includes descriptions of methods and procedures that apply to crude oil and petroleum products. While this document includes descriptions of common line fill verification methods, it does not recommend any particular method. The responsibility for selecting a method appropriate for a given terminal, and documenting its effectiveness, rests with those responsible for operating the terminal where it is applied. Pages: 10

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

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

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

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

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

Provides a recommended practice for the calculation and application of a VEF and provides guidelines for data compilation, data validation, and recommendations on the appropriate use of VEF during custody transfer involving marine tank vessels. It also provides clear guidance on maintenance of quantity data on board the vessel, calculation of VEFs, and application of VEFs. The key aim is to provide a single unambiguous figure for VEFL or VEFD and to remove the possibility of any arbitrary inclusion or exclusion of data on the part of the individual(s) performing the final calculation. Also provides instruction for parcel tankers, part cargoes, compartmental VEFs, and vessel-to-vessel transfers. The methods are applicable to liquid bulk cargoes including crude oil, petroleum products, chemicals, and liquefied petroleum gases. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM49. Pages: 22

2nd Edition | May 2012 | 2-Year Extension: October 2016
Product Number: H170902 | Price: $165.00

Chapter 17.9 *
Vessel Experience Factor (VEF)—Spanish

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

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

Chapter 17.10.1/ISO 10976:2012
Measurement of Cargoes On Board Marine Gas Carriers, Part 1—Liquefied Natural Gas
(ANSI/API *MPMS* Ch. 17.10.1)

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

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

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

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

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

Chapter 17.11 ■
Measurement and Sampling of Cargoes On Board Tank Vessels Using Closed and Restricted Equipment

Provides guidance on the use, maintenance, and calibration of restricted and closed measurement and sampling equipment. It also provides guidance on preferred size and positioning for gauging and sampling fittings on vessels. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM52. Pages:19

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

Chapter 17.12
Procedures for Bulk Liquid Chemical Cargo Inspections

Provides systematic cargo measurement procedures for use primarily by cargo inspectors and to specify procedures directed at minimizing cargo contamination and losses, in the absence of, or in conjunction with, specific client guidelines. This document should be considered a summary of best practices used within the industry. A joint API/Energy Institute (EI) standard, it also carries the EI designation Hydrocarbon Management, HM51. Pages: 66

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

Chapter 18
Custody Transfer

Covers application of other measurement standards to unique custody transfer situations.

Chapter 18.1
Measurement Procedures for Crude Oil Gathered from Small Tanks by Truck

Describes procedures to encourage uniform custody transfer measurement and testing practices for crude oil gathered from small tanks (1,000 barrels or less in capacity) by truck. The publication contains recommended steps for manually determining the quantity and quality of crude oil being transferred in trucks under field conditions. This publication is of interest to measurement personnel and crude oil producers and transporters. Pages: 13

2nd Edition | April 1997 | Reaffirmed: February 2012
Product Number: H18012 | Price: $115.00

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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: $125.00

Chapter 19
Evaporation Loss Measurement

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

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

Chapter 19.1
Evaporative Loss from Fixed-Roof Tanks
(previously Publ 2518)

Contains methodologies for estimating the total evaporative losses of hydrocarbons from fixed-roof tanks. The methodologies provide loss estimates for general equipment types based on laboratory, test-tank, and field-tank data. Types of fixed-roof tanks and roof fittings described are for information only.

The equations estimate average annual losses from uninsulated fixed-roof tanks for various liquid stocks, stock vapor pressures, tank sizes, meteorological conditions, and operating conditions.

The following special cases are addressed:

- horizontal tanks,
- higher volatility stocks (true vapor pressure greater than 0.1 psia), and
- vent settings higher than 0.03 psia (0.5 oz/in.^{2}).

The estimation may be improved by using detailed field information, including climatic data and operational data for the appropriate time period.

The equations are not intended to be used in the following applications.

- To estimate losses from unstable or boiling stocks or from petroleum liquids or petrochemicals for which the vapor pressure is not known or cannot readily be predicted [to calculate emissions from tanks that contain material at or above their boiling point or the point at which material starts to flash, the API model E&P Tank (Publ 4697) can be used].
- To estimate losses from fixed-roof tanks that have an internal floating roof. Ch. 19.2 and TR 2569 address these.
- To estimate losses from fixed-roof tanks that have either roof or shell insulation.
- To estimate losses from cleaning fixed-roof tanks. TR 2568 addresses this.

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

- Consolidation of common material in Ch. 19.4. Material that had previously been included in both Ch. 19.1 and Ch. 19.2 has been moved to Ch. 19.4. Ch. 19.4, which was previously *Recommended Practice for Speciation of Evaporative Losses*, now has the title *Evaporative Loss Reference Information and Speciation Methodology*. This chapter had already contained reference information on the properties of chemicals and typical petroleum liquids, and this information has now been removed from Ch. 19.1 and Ch. 19.2. In addition, meteorological data have been moved from Ch. 19.1 and Ch. 19.2 to Ch. 19.4. In the revised documents:
  - meteorological data are found in Ch. 19.4;
  - calculation of storage tank temperatures is found in Ch. 19.1 and Ch. 19.2 (in that fixed-roof tanks involve calculation of the vapor space temperature in order to determine vapor density, whereas this step is not involved in estimating emissions from floating-roof tanks); and
  - calculation of true vapor pressure is found in Ch. 19.4 (in that this is now calculated in the same manner for both fixed- and floating-roof tanks). Pages: 26

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

Chapter 19.1D
Documentation File for API Manual of Petroleum Measurement Standards Chapter 19.1—Evaporative Loss from Fixed-Roof Tanks
(previously 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: $171.00

Chapter 19.2
Evaporative Loss from Floating-Roof Tanks
(previously Publ 2517 and Publ 2519)

Contains methodologies for estimating the total evaporative losses of hydrocarbons from external floating-roof tanks (EFRTs), freely vented internal floating-roof tanks (IFRTs), and domed external floating-roof tanks (domed EFRTs). The methodologies provide loss estimates for general equipment types based on laboratory, test-tank, and field-tank data. Types of floating roofs, rim-seal systems, and deck fittings are described for information only.

The equations estimate average annual losses from floating-roof tanks for various types of tank construction, floating-roof construction, rim-seal systems, and deck fittings, as well as for various liquid stocks, stock vapor pressures, tank sizes, and wind speeds (EFRTs).

The equations were developed for:

- stocks with a true vapor pressure greater than approximately 0.1 psia,
- average wind speeds ranging from 0 miles per hour (mph) to 15 mph (EFRTs), and
- tank diameters greater than 20 ft.

The estimation techniques become more approximate when these conditions are not met.

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: 85

3rd Edition | October 2012 | Product Number: H190203 | Price: $176.00

Chapter 19.3, Part A
Wind Tunnel Test Method for the Measurement of Deck-Fitting Loss Factors for External Floating-Roof Tanks

Describes the procedures to establish evaporative loss factors for deck fittings on external floating-roof tanks. The test method involves measuring the weight loss of a test assembly over time. The standard specifies the test apparatus, instruments, test procedures, and calculation procedures to be used. It also addresses the variables to be measured, format for reporting the test values, and their associated uncertainty. Pages: 27

1st Edition | June 1997 | Reaffirmed: September 2012
Product Number: H1903A | Price: $122.00

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: October 2012
Product Number: H1903B | Price: $122.00

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: November 2012
Product Number: H1903C | Price: $122.00

Chapter 19.3, Part D
Fugitive Emission Test Method for the Measurement of Deck-Seam Loss Factors for Internal Floating-Roof Tanks

Establishes a uniform method for measuring evaporative deck-seam loss factors and deck-joint loss factors of mechanically joined deck seams that are used on internal floating-roof tanks. These deck-seam loss factors and deck-joint loss factors are to be determined in terms of their loss rate at specified pressure differences across the deck seam or deck joint for certification purposes. Pages: 31

1st Edition | June 2001 | Reaffirmed: December 2012
Product Number: H1903D | Price: $122.00

Chapter 19.3, Part E
Weight Loss Test Method for the Measurement of Deck-Fitting Loss Factors for Internal Floating-Roof Tanks

Describes the test methods to be used to establish evaporative loss factors for deck fittings on internal floating-roof tanks. This chapter specifies the test apparatus, instruments, test procedures, and calculation procedures to be used. The standard also addresses the requirements for reporting test report values. Pages: 30

1st Edition | May 1997 | Reaffirmed: October 2012
Product Number: H1903E | Price: $122.00

Chapter 19.3, Part H
Tank Seals and Fittings Certification—Administration

Provides guidance for the administration of the former API Tank Seals and Fittings Certification Program. The document includes detailed methods for monitoring and analysis of tests conducted on individual devices and describes the steps in the certification process. Pages: 53

1st Edition | March 1998 | Reaffirmed: August 2016
Product Number: H1903H | Price: $122.00

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

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

Speciation of emissions from hydrocarbon mixtures accounts for the higher evaporation rate of the more volatile components, resulting in a different composition of the mixture in the vapor phase than in the liquid phase. The methodology presented in this standard assumes that there is sufficient liquid present such that the chemical composition at the liquid surface may be considered to not change as a result of the evaporative loss.

This standard also contains reference information used for estimating emissions in accordance with Ch. 19.1, Ch. 19.2, and Ch. 19.5.

The methodology in this standard applies to:

- liquids with vapor pressure that has reached equilibrium with ambient conditions at a true vapor pressure less than the ambient atmospheric pressure (i.e. not boiling);

- liquids for which the vapor pressure is known or for which sufficient data are available to determine the vapor pressure; and
- liquid mixtures where Raoult's Law can be used to describe the vapor phase equilibria.

This methodology does not apply to:

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

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

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

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

Chapter 19.5

Atmospheric Hydrocarbon Emissions from Marine Vessel Transfer Operations

(formerly Publ 2514A)

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

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

The emission estimates are for uncontrolled loading operations and do not apply to operations using vapor balance or vapor control systems or ballasting of ships with segregated ballast tanks. This standard does not address evaporative loss for:

- very large crude carriers (VLCCs) or ultra large crude carriers (ULCCs) (unless the saturation factor KS is determined);
- marine vessels employing crude oil washing;
- marine vessel transit loss;
- loading ballast water into marine vessels that, prior to dockside unloading, held anything other than crude oil (unless the saturation factor KS is determined); or
- unloading marine vessels.

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

1st Edition | September 2009 | Reaffirmed: October 2014
Product Number: H19051 | Price: $124.00

Publ 2524

Impact Assessment of New Data on the Validity of American Petroleum Institute Marine Transfer Operation Emission Factors

Consultant CH2M Hill confirmed the validity of the model used in Publ 2514A by comparing emission test data with predictive emission models developed by API, ARCO, and Exxon. The study found that the API model adequately predicts emissions for tanks ranging in size from 17,000 to 35,000 dead weight tons and for tanks being loaded within the lower-48 states. The model does not appear to apply to crude oil loading of tankers in Valdez, Alaska, because of unique local operating conditions. However, no known test data invalidates the model for predicting crude oil loading emissions from carriers smaller than very large crude carriers in the lower-48 states. Pages: 194

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

Publ 2558

Wind Tunnel Testing of External Floating-Roof Storage Tanks

Presents the results of a wind tunnel study to determine the local wind velocities, wind directions, and roof pressures on external floating roof tanks. Pages: 13

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

TR 2567

Evaporative Loss from Storage Tank Floating Roof Landings

Investigates storage tank emissions that may result from landing and subsequently refloating a floating roof. The existing emission factors for floating-roof tanks are based on the assumption that the floating roof is continuously floating on the stored stock liquid. Additional emissions may occur, however, if the tank is emptied such that the floating roof is no longer floating. This study sought to quantify these floating-roof landing loss emissions. Pages: 26

1st Edition | April 2005 | Product Number: H256701 | Price: $106.00

TR 2568

Evaporative Loss from the Cleaning of Storage Tanks

Provides guidance for estimating emissions that result from removing the liquid heel (free-standing stock liquid) and cleaning the remaining deposits of stock liquid mixed with residue and water (sludge) from the bottoms of aboveground storage tanks. The emissions addressed in this report are those that leave the tank during the tank cleaning process. This report does not address:

- the fate of vapors after the have left the tank (other accounting for the efficiency of the control device),
- the fate of sludge after it has left the tank (or emissions that may occur during sludge treatment or disposal), or
- emissions that may be expelled by the vacuum pump of a vacuum truck or suction pump, if such devices are used in the tank cleaning process.

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

1st Edition | November 2007 | Product Number: H25680 | Price: $107.00

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: $107.00

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: $105.00

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: $110.00

Chapter 20
Allocation Measurement of Oil and Natural Gas

Chapter 20.1
Allocation Measurement
(includes Addendum 1 dated January 2013 and Addendum 2 dated November 2016)

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: October 2016
Product Number: H30701 | Price: $109.00

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 API *MPMS* Ch. 20.1. Pages: 33

1st Edition | November 2016 | Product Number H200201 | Price: $124.00

Chapter 20.3
Measurement of Multiphase Flow
(supersedes RP 86)

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

This document refers to existing standards and recommended practices to supplement the guidance it provides in this subject area. The document addresses principles used in multiphase flow measurement, multiphase metering types and classifications, assessment of expected performance, and selecting and operating multiphase measurement systems. Operational requirements or constraints are addressed, including expectations for flow meter acceptance, calibration criteria, flow loop and in situ verifications, and other guidance specific to different multiphase flow metering applications. The document does not address specific meter configurations. Pages: 72

1st Edition | January 2013 | Product Number: H200301 | Price: $180.00

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: $90.00

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
Product Number: G08501 | Price: $123.00

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

Provides the user with recommended "field" methods of sampling, sample handling, and analysis for high water content streams up to 50 % water on a volumetric basis. In particular, this 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 September 2012
Product Number: G08701 | Price: $90.00

Chapter 21
Flow Measurement Using Electronic Metering Systems

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

Chapter 21.1
Flow Measurement Using Electronic Metering Systems—Electronic Gas Measurement
(ANSI/API *MPMS* Ch. 21.1-2011) (AGA Report No. 3)

Describes the minimum specifications for electronic gas measurement systems used in the measurement and recording of flow parameters of gaseous phase hydrocarbon and other related fluids for custody transfer applications utilizing industry recognized primary measurement devices. This standard provides the minimum reporting and change management requirements of the various intelligent components required for accurate and auditable measurement. The requirements can be met by a combination of electronically and/or manually recorded configuration, test reports, change record reporting of the electronic gas measurement system components, and flow parameters. It is recognized that diagnostic capabilities of the newer meter and transmitter technologies are important but due to the device specific complexity, intelligent device diagnostics are out of scope for this standard. Pages: 94

2nd Edition | February 2013 | Product Number: H210102 | Price: $165.00

Chapter 21.2
Electronic Liquid Volume Measurement Using Positive Displacement and Turbine Meters

Provides guidance for the effective use of electronic liquid measurement systems for custody transfer measurement of liquid hydrocarbons under the following conditions. Use of the measurement systems must fall within the scope and field of application of Ch. 12.2. Guidance applies to systems using turbine or positive displacement meters. Guidance applies to systems using on-line correction for the effect of temperature on liquid (CTL) and correction for the effect of pressure on liquid (CPL) compensation. The procedures and techniques in Ch. 21.2 are recommended for new measurement applications. This standard provides custody transfer measurement procedures for pipeline and other electronic liquid metering systems including design, selection, use, auditing, reporting, calibration, verification, and security. Pages: 60

1st Edition | June 1998 | Reaffirmed: October 2016
Product Number: H21021 | Price: $191.00

Chapter 21.2-A1
Addendum 1 to Flow Measurement Using Electronic Metering Systems, Inferred Mass

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

1st Edition | August 2000 | Reaffirmed: October 2016
Product Number: H2102A | Price: $60.00

Chapter 22
Testing Protocols

Testing protocols for devices used in the measurement of hydrocarbon fluids. Testing protocols define appropriate methods for measuring and reporting the performance characteristics of similar equipment in a comparable manner, thus providing a means to highlight the relative performance advantages and disadvantages of similar devices.

Chapter 22.1
General Guidelines for Developing Testing Protocols for Devices Used in the Measurement of Hydrocarbon Fluids
(ANSI/API *MPMS* Ch. 22.1-2015)

Intended for the development of testing protocols and to serve as a guideline to document performance characteristics of hydrocarbon fluid measurement related devices. Pages: 7

2nd Edition | August 2015 | Product Number: H220102 | Price: $87.00

Chapter 22.2
Testing Protocols—Differential Pressure Flow Measurement Devices (supersedes Ch. 5.7)

Defines the testing and reporting protocols for flow measurement devices based on the detection of a pressure differential that is created by the device in a flowing stream. This protocol is designed to supply industry with a comparable description of the capabilities of these devices for the measurement of single-phase fluid flow when they are used under similar operating conditions. The objectives of this testing protocol are to:

- ensure that the user of any differential pressure flow meter knows the performance characteristics of the meter over a range of Reynolds numbers as applicable or defined by tests;
- facilitate both the understanding and the introduction of new technologies;
- provide a standardized vehicle for validating manufacturer's performance specifications;
- provide information about relative performance characteristics of the primary elements of the differential pressure metering devices under standardized testing protocol;
- quantify the uncertainty of these devices and define the operating and installation conditions for which the stated uncertainties apply. Pages: 29

1st Edition | August 2005 | Reaffirmed: August 2012
Product Number: H220201 | Price: $87.00

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

Chapter 22.3
Testing Protocol for Flare Gas Metering
(ANSI/API *MPMS* Ch. 22.3-2015)

Describes a testing protocol for flare gas meters. This includes a discussion of the testing to be performed, how the test data should be analyzed, and how an uncertainty is determined from the testing of the meter. The scope does not include the general guidelines to flare gas metering that are covered under Ch. 14.10. Pages: 21

1st Edition | August 2015 | Product Number: H220301 | Price: $98.00

Chapter 22.6
Testing Protocol for Gas Chromatographs

A general gas chromatograph (GC) performance test protocol that specifies the scope and reporting requirements of GC tests for repeatability, reproducibility, and response linearity. The protocol specifies requirements for tests over a range of gas compositions, tests over a range of environmental conditions, and long-term performance tests. Pages: 50

1st Edition | August 2015 | Product Number: H220601 | Price: $98.00

Chapter 23
Reconciliation of Hydrocarbon Quantities

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

Chapter 23.1 ■
Reconciliation of Liquid Pipeline Quantities
(supersedes Std 2560)

Provides methodologies for monitoring liquid pipeline loss/gain and for determining the normal loss/gain level for any given pipeline system. Troubleshooting suggestions are also presented. This document does not establish industry standards for loss/gain level because each system is individual and exhibits its own loss/gain level and/or patterns under normal operating conditions. The document provides operational and statistically based tools for identifying when a system has deviated from normal, the magnitude of the deviation, and guidelines for identifying the causes of deviation from normal.

The primary application of this publication is in custody transfer liquid pipeline systems in which there is provision for measuring all liquids that enter the system and exit the system, as well as liquid inventory within the system. The application is not intended for nonliquid or mixed-phase systems. The applications and examples in this document are intended primarily for custody transfer pipeline systems, but the principles may be applied to any system that involves the measurement of liquids into and out of the system and, possibly, inventory of liquids within the system. Such systems may include pipelines, marine terminals, marine voyages, bulk loading or storage terminals, tank farms, and rail and trucking systems. Pages: 35

1st Edition | June 2016 | Product Number: H230101 | Price: $95.00

Publ 2566
State of the Art Multiphase Flow Metering

Provides information on multiphase flow metering systems gleaned from more than 150 published documents that are in the public domain. The documentation was prepared from information obtained through mid-2002. It should be noted that the indicated performances data stated in these published documents have not necessarily been verified by an independent body. The listing of these references in the Appendix 2 is intended to provide a comprehensive source of data and information on multiphase metering; the reader needs to carefully review the source of the data in the documents when utilizing the information. Pages: 80

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

TR 2571
Fuel Gas Measurement

Provides a performance-based methodology for the measurement and reporting of fuel gas consumption. The document provides guidance in the following areas to allow the user to achieve a targeted uncertainty of measurement:

- selection of flow meter type; differential pressure (DP), displacement, ultrasonic, Coriolis, vortex, turbine, thermal, and others;
- associated instrumentation for measuring fluid properties and flowing conditions, such as pressure and temperature transmitters, densitometers, gas chromatographs;
- obtaining and use of gas composition or other analytical data;
- design and installation requirements of the measurement system;
- inspection, verification, and calibration practices of flow meters and their associated accessory instrumentation; and
- simplified uncertainty calculations with examples to illustrate the methodology.

Techniques are described to assess the uncertainty contribution of individual components of fuel gas measurement systems and overall facility fuel gas measurement uncertainty. Pages: 67

1st Edition | March 2011 | Product Number: H257101 | Price: $124.00

TR 2572
Carbon Content, Sampling, and Calculation

Carbon emission quantities can be calculated from either the volume/mass of fuel or feedstock fed to a process (as applicable) and carbon content of the process or fuel supply, or by directly measuring volume/mass emissions. This technical report (TR) provides guidance on the sampling and calculation of carbon content of process or fuel supplies. The API companion technical report, TR 2571, can be referenced for guidance on measuring the volume/mass of process fuel gas or feedstock, and the *API Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Natural Gas Industry* can be reference for guidance on the calculation of emissions.

TR 2572 provides guidance and a methodology for the determination of carbon content from hydrocarbon-based petroleum and petrochemical products, and the uncertainty of the average carbon content as calculated from multiple samples taken during a reporting period. This method is intended to make use of industry-accepted mixture property data and test methods with no new or modified test methods introduced in this document. The method is applicable to carbon-content-based reporting or trading for all gaseous and liquid hydrocarbons.

This TR provides references and supplemental information on applicable industry practices based on the published resources, existing industry standards, industry-accepted physical constants, or properties of hydrocarbons for measurement, sampling, sampling frequency, and analysis of hydrocarbon samples. Pages: 24

1st Edition | May 2013 | Product Number: H257201 | Price: $100.00

TR 2575
Measurement of Thermally Cracked Gas

Presents a method to compute the density, compressibility factor, and supercompressibility factor for thermally cracked gas (TCG) for custody transfer using orifice meters. It provides equations, parameters, computation flow diagrams, and example spreadsheet calculations. This technical report applies to TCG mixtures after treatment. It applies for temperature from 90 °F to 120 °F (305 K to 322 K) at pressures up to 300 psig (2 MPa). It is limited to a specific operating region. The method is for the single gas phase only. Pages: 17

1st Edition | September 2014 | Product Number: H257501 | Price: $65.00

If you have any questions or comments regarding API standards, please visit www.api.org/standards.

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

GENERAL

Publ 1593
Gasoline Marketing in the United States Today

Provides information on motor fuel and gasoline consumption, U.S. motor fuel distribution, the U.S. gasoline pricing system, motor gasoline prices and taxes, the number/configuration of retail gasoline outlets, and employment/productivity in the retail gasoline distribution industry. Pages: 77

3rd Edition | May 1992 | Product Number: A15930 | Price: $115.00

Publ 1673
Compilation of Air Emission for Petroleum Distribution Dispensing Facilities

Compiles the most widely accepted, available emission factors and emission estimation techniques for developing air emission estimates from evaporative loss sources of petroleum products at marketing and distribution facilities. These losses can occur from transfer and storage operations and fugitive equipment leaks and spillage. Pages: 29

2nd Edition | July 2009 | Product Number: A16732 | Price: $81.00

AVIATION

RP 1543
Documentation, Monitoring and Laboratory Testing of Aviation Fuel During Shipment from Refinery to Airport

Aviation fuels pass through a variety of storage and handling facilities, from refinery to airport. As aviation fuels are stored and transported in storage and transportation systems where contact with non-aviation products may occur, a fuel quality monitoring program is required, in addition to equipment, operating, inspection and maintenance standards. The purpose of this practice is to ensure the fuel remains on specification. This recommended practice (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 | Product Number: A154301 | Price: $59.00

RP 1595
Design, Construction, Operation, Maintenance, and Inspection of Aviation Pre-Airfield Storage Terminals

Contains basic requirements for the design, construction, operation, and maintenance of pre-airfield storage terminals located directly upstream of the airport, hereafter referred to as "pre-airfield storage terminals." This recommended practice provides guidance on the minimum equipment standards and operating procedures for the receipt and storage of aviation fuels at pre-airfield storage terminals, located directly upstream of the airport, and its shipment directly via a grade-dedicated pipeline, marine vessel (barge or ship), or road/rail transport to an airport. This RP does not address in-transit or breakout storage upstream of the pre-airfield storage terminal. The design and construction provisions of this standard are intended for application at new facilities. Application of the design and construction provisions of this standard to facilities, equipment, structures, or installations that are already in place, that are in the process of construction or that are installed before the date of this publication, should be evaluated when circumstances merit. Such an evaluation should consider the site-specific circumstances and detailed accounting for both the potential and tolerance for risk, existing conditions at the installation, and overall benefit for applying the required design and construction provisions. The operation, sampling, testing, and maintenance provisions in the various sections of this standard shall apply to both new and existing installations. Pages: 75

2nd Edition | October 2012 | Product Number: C159502 | Price: $232.00

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

EI 1529
Aviation Fuelling Hose

EI 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:

www.energypublishing.org

MARKETING OPERATIONS

RP 1525 ◆
Bulk Oil Testing, Handling, and Storage Guidelines

Designed to be used as a reference and management guide by personnel operating and managing petroleum and tank facilities associated with the storage and distribution of petroleum lubricants. Topics covered include equipment and facility standards, product sampling and testing methods and equipment, receiving and storage of bulk lubricants, and packaging and loading petroleum lubricants for distribution to other facilities. Pages: 28

1st Edition | June 1997 | Product Number: F15251 | Price: $65.00

RP 1604
Closure of Underground Petroleum Storage Tanks

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

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

RP 1615
Installation of Underground Petroleum Storage Systems

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 | Product Number: A16156 | Price: $205.00

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 2012
Product Number: A16210 | Price: $83.00

RP 1626
Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Filling Stations
(includes Errata 1 dated February 2011)

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

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

Std 1631
Interior Lining and Periodic Inspection of Underground Storage Tanks

Provides minimum recommendations for the interior lining of existing steel and fiberglass reinforced plastic underground tanks used to store petroleum-based motor fuels and middle distillates. Recommendations and procedures to be followed by contractors, mechanics, and engineers are presented. 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: December 2010
Product Number: A16315 | Price: $86.00

RP 1637
Using the API Color-Symbol System to Mark Equipment and Vehicles for Product Identification at Gasoline Dispensing Facilities and Distribution Terminals
(includes Errata 1 dated January 2007)

Describes a system for marking equipment used to store and handle bulk petroleum, alcohol-blended petroleum and biodiesel products. The marking system described in this recommended practice does not cover aviation fuels. Marking systems for aviation fuels are described in API/IP Std 1542. Pages: 15

3rd Edition | July 2006 | Reaffirmed: May 2012
Product Number: A16373 | Price: $66.00

RP 1639
Owner/Operator's Guide to Operation and Maintenance of Vapor Recovery Systems at Gasoline Dispensing Facilities

Provides guidance for owners and operators of gasoline dispensing facilities and regulatory officials regarding the operation and maintenance of gasoline vapor recovery systems and components. Proper operation and maintenance of the equipment can improve compliance with vapor recovery regulations and provide substantial emission reductions. This guide does not address the maintenance required qualified service technicians. Pages: 22

1st Edition | July 2003 | Reaffirmed: May 2012
Product Number: A16391 | Price: $86.00

RP 1640
Product Quality in Light Product Storage and Handling Operations

Prepared by the API Fuels Marketing Subcommittee with technical participation and feedback from other industry stakeholders. It assists those involved in fuel handling at distribution and intermediate storage facilities. This publication provides guidance on the minimum equipment standards and operating procedures for the receipt, storage, blending, and delivery of light products, their blend components, and additives at distribution and intermediate storage terminals, including related operations of pipeline, marine vessel (barge or ship), and road/rail transport. This RP also covers the minimum equipment standards and operating procedures for the receipt, storage, blending of light products, including but not limited to gasoline, kerosene, diesel, heating oil and their blend components (i.e. ethanol, biodiesel, and butane) at distribution and storage terminals, as well as light product shipments directly via a pipeline, marine vessel (barge or ship) or road and rail transport. In addition, this RP provides guidance for the design, construction, operation, and maintenance of light products storage and distribution terminals with the specific intent of protecting or ensuring product quality. Pages: 64

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

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: $60.00

Publ 1645
Stage II Cost Study

Addresses the general installation cost information for three different types of retail gasoline outlet (RGO) vapor recovery systems: vapor balance, passive vacuum assist, and active vacuum assist. Additionally, it provides an overview of how each system operates. Pages: 6

1st Edition | August 2002 | Product Number: A16451 | Price: $57.00

Std 2610
Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities

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

The purpose of this standard is to consolidate a wide base of current industry experience, knowledge, information, and management practices into a cohesive standard comprising a range of best practices. Pages: 53

2nd Edition | May 2005 | Reaffirmed: December 2010
2-Year Extension: May 2016 | Product Number: C26102 | Price: $122.00

Std 2610 *
Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities—Spanish

Spanish translation of Std 2610.

2nd Edition | May 2005 | Product Number: C26102SP | Price: $121.00

RP 2611
Terminal Piping Inspection—Inspection of In-Service Terminal Piping Systems

Covers the inspection of typical terminal piping systems within terminal boundaries, which includes off-plot piping. Off-plot piping includes, but is not limited to piping between facilities, piping that comes from or goes to a refinery, or other type facility, or piping that may cross a road, ditch, or other property outside the confines of a terminal facility. Piping for transportation of finished fuel products, such as gasoline, diesel, lubricating oils, jet fuel, and aviation fuel, are covered by the scope of this document. Also covered are piping systems for nonfuel-type fluids. The piping for other terminal nonfuel-type fluids typically found in terminals, include asphaltic products, process water, transmix, slop water, and biofuels. This document does not address piping in a refinery facility, sanitary waste piping, cast iron piping, and nonmetallic gravity flow piping systems. Pages: 42

1st Edition | June 2011 | Product Number: A261101 | Price: $98.00

USED OIL

A Guidebook for Implementing Curbside and Drop-Off Used Motor Oil Collection Programs

Designed to help municipal managers and regulators evaluate the types of available programs (either curbside or drop-off programs, including examples of both), and how to effectively implement these used oil recycling programs. It is based on national surveys of existing programs throughout the country and includes examples of budgets, procedures, equipment, and model programs that are currently underway. Pages: 47

1st Edition | February 1992 | Product Number: B20002 | Price: Free

National Used Oil Collection Study

Reviews the status of used engine oil collection in the United States. Documents state efforts to collect oil and the outcomes of such efforts. Provides examples of how used oil collection can be successful, as well as warning of the pitfalls that should be avoided, based on the experience of other states. Pages: 248

1st Edition | June 1996 | Product Number: B18301 | Price: $59.00

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: $59.00

TANK TRUCK OPERATIONS

For Safety's Sake—MC 306 Cargo Tank Vehicle Inspection

This VHS tape provides a step-by-step approach to pre- and post-trip inspection of MC 306 cargo tank vehicles. The tape follows a driver through an actual walk-around inspection and covers driver recordkeeping and the inspection itself—brakes, lights, mirrors, tires, wiring, the tank, and placards. Also includes common truck defects. The videotape was prepared under the direction of the API Highway Safety Committee and parallels the U.S. Department of Transportation's truck inspection regulations. Two minutes of blank leader is provided on the tape so that it can be customized to fit company training needs. VHS tape: 14 minutes. Pages: 65

January 1989 | Product Number: A11500 | Price: $103.00

RP 1004
Bottom Loading and Vapor Recovery for MC-306 & DOT-406 Tank Motor Vehicles

Provides an industry standard for bottom loading and vapor recovery of proprietary and hired carrier DOT MC-306 tank vehicles at terminals operated by more than one supplier. Guides the manufacturer and operator of a tank vehicle as to the 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
Product Number: A10048 | Price: $111.00

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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
Product Number: A10071 | Price: $39.00

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

Provides minimum guidelines for developing an emergency response plan for incidents involving hazardous liquid hydrocarbons, such as gasoline and crude oil, transported in MC 306/DOT 406 and MC 307/DOT 407 aluminum cargo tanks, and for coordinating and cooperating with local, state, and federal officials. Covers response plan priorities, personnel training, special equipment, media relations, environmental relations, and post-response activities. The 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
Product Number: A11123 | Price: $76.00

MOTOR OILS AND LUBRICANTS

Motor Oil Shelf Cards ◆

This two-page laminated guide helps consumers understand the API Engine Oil Quality Marks—the API Certification Mark, "Starburst," and Service Symbol, "Donut," and the API Service Categories. Shelf Cards are available in English and Spanish and can be personalized with a company logo. For information on personalizing the shelf cards, call 202-682-8156.

Single copies free on request from API [eolcs@api.org or (202)-682-8516]
Packs of 50 for $130.00

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

Describes the voluntary API Engine Oil Licensing and Certification System (EOLCS) and explains to marketers how different API marks are licensed and displayed for the consumer. The publication describes methods for developing new engine oil performance requirements and provides the marketer with a description of the API marks and their use, licensing requirements, aftermarket conformance, and enforcement procedures. EOLCS is the result of cooperation between U.S. and Japanese automobile manufacturers, diesel engine manufacturers, the additive industry represented by the American Chemistry Council (ACC), and the U.S. petroleum industry represented by API. This program benefits consumers, the petroleum industry, and gasoline- and diesel-engine manufacturers. Pages: 72

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

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

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

This directory can be accessed only through API's website, www.api.org

DIESEL FUEL

Publ 1571
Diesel Fuel—Questions and Answers for Highway and Off-Highway Use

Provides answers to some of the frequent questions asked about diesel fuel. Included are explanations of the quality features of diesel fuel and their significance, descriptions of diesel fuel classifications, discussions of additives normally used and their purposes, and explanations of factors that can affect performance. Pages: 20

4th Edition | January 1996 | Product Number: F15714
Price: Pack of 25 for $73.00

HEALTH, ENVIRONMENT, AND SAFETY: GENERAL

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

Applies to storage tanks associated with marketing, refining, pipeline, and terminals operations and with tanks containing Class I or Class II petroleum liquids and use is recommended for Class III petroleum liquids. This standard addresses overfill protection for petroleum storage tanks. It recognizes that prevention provides the most basic level of protection, thus while using both terms "protection" and "prevention," the document emphasizes prevention. The standard's scope covers overfill (and damage) prevention practices for aboveground storage tanks in petroleum facilities, including refineries, marketing terminals, bulk plants, and pipeline terminals that receive flammable and combustible liquids. The fourth edition continues to build on experience and new technology through the use of management systems. Since operations are the primary overfill prevention safeguard, new definitions and requirements are established for alarms. Risk reduction is also addressed by current and generally accepted industry practices.

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

The purpose of this standard is to assist owner/operators and operating personnel in the prevention of tank overfills by implementation of a comprehensive overfill prevention process (OPP). The goal is to receive product into the intended storage tank without overfill or loss of containment.

This standard does not apply to: underground storage tanks; aboveground tanks of 1320 U.S. gallons (5000 liters) or less; aboveground tanks which comply with PEI 600; pressure vessels; tanks containing non-petroleum liquids; tanks storing LPG and LNG; tanks at service stations; tanks filled exclusively from wheeled vehicles (i.e. tank trucks or railroad tank cars); and tanks covered by OSHA 29 *CFR* 1910.119 and EPA 40 *CFR* 68, or similar regulations. Pages: 47

4th Edition | May 2012 | Product Number: K235004 | Price: $114.00

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

HEALTH, ENVIRONMENT, AND SAFETY: WASTE

Publ 1638
Waste Management Practices for Petroleum Marketing Facilities

Provides specific guidance for managing typical waste streams at petroleum marketing facilities. This publication covers petroleum marketing facilities ranging from retail fuel convenience stores to terminals and lube plants. Pages: 20

1st Edition | October 1994 | Product Number: A16381 | Price: $76.00

HEALTH, ENVIRONMENT, AND SAFETY: WATER

Publ 1612
Guidance Document for Discharging of Petroleum Distribution Terminal Effluents to Publicly Owned Treatment Works

Provides terminal managers with guidance on discharging terminal effluents to publicly owned treatment works (POTWs). Covers relations with POTW personnel, POTW concerns in accepting terminals wastewater, pretreatment regulations and local limits on the discharge of wastewaters to POTWs, and associated costs. Pages: 34

1st Edition | November 1996 | Product Number: A16121 | Price: $97.00

Publ 1669
Results of a Retail Gasoline Outlet and Commercial Parking Lot Storm Water Runoff Study

Presents the findings of a study to characterize storm water runoff from retail gasoline outlets and compares the results with runoff from commercial parking lots and published urban "background" values. Funded by the Western States Petroleum Association (WSPA) and the American Petroleum Institute (API), the results of this study indicate that fueling activities at normally operated and maintained retail gasoline outlets do not contribute additional significant concentrations of measured constituents in storm water runoff. Pages: 24

1st Edition | December 1994 | Product Number: A16691 | Price: $83.00

HEALTH, ENVIRONMENT, AND SAFETY: SOIL AND GROUNDWATER

Publ 1628
A Guide to the Assessment and Remediation of Underground Petroleum Releases

Provides an overview of proven technologies for the assessment and remediation of petroleum releases in soil and groundwater. Covers accidental releases arising from the production, transportation, refining, and marketing of liquid petroleum products or unrefined crude oil. Pages: 119

3rd Edition | July 1996 | Product Number: A16283 | Price: $164.00

Publ 1628 and its five companion publications (1628A, 1628B, 1628C, 1628D, and 1628E) may be purchased as a set.
Order Number: A1628S | Price: $323.00

Publ 1628A
Natural Attenuation Processes

Describes the physical, chemical, and biological processes that decrease the concentrations and ultimately limit the extent of the dissolved plume migrating from a hydrocarbon release. Pages: 16

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

Publ 1628B
Risk-Based Decision Making

Discusses risk-based decision making approaches used for the assessment of hazardous conditions. Also presents information that can be utilized to focus remedial measures and funds on petroleum hydrocarbon release sites while being protective of human health and the environment, and to facilitate timely closure of hydrocarbon-impacted sites. Pages: 13

1st Edition | July 1996 | Product Number: A1628B | Price: $59.00

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: $59.00

Publ 1628D
In-Situ Air Sparging

Addresses in-situ air sparging. Covers remediation technologies, starting with the early techniques of containment or mass reduction through today's very aggressive site closure techniques. Addresses containment as well as residual petroleum hydrocarbon compounds. Pages: 13

1st Edition | July 1996 | Product Number: A1628D | Price: $59.00

Publ 1628E
Operation and Maintenance Considerations for Hydrocarbon Remediation Systems

Discusses concepts regarding operation and maintenance procedures necessary to achieve and maintain optimal performance of petroleum hydrocarbon remediation systems.

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

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: $150.00

SECURITY

API Standard for Third Party Network Connectivity

Provides guidance for implementing secure third-party connections between the information technology systems and a network of two companies that have a business relationship and a common objective. The standard provides suggestions for companies to follow to establish third-party network connections, while protecting their individual systems and data from unauthorized access or manipulation. Pages: 36

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

Security Guidelines for the Petroleum Industry

API's 3rd Edition of this document is now in use at oil and gas facilities around the world to help managers decide how to deter terrorist attacks. Covering all segments of the industry (production, refining, transportation, pipeline, and marketing), this guidance builds on the existing solid foundation of design and operational regulations, standards, and recommended practices, which relate to facility design and safety, environmental protection, emergency response, and protection from theft and vandalism. Produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies, these guidelines, viewed as a living document, are broadly applicable to facility security in light of September 11, 2001, and provide the starting point for developing security plans at oil and natural gas facilities and operations. Pages: 58

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

Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

API and the National Petrochemical & Refiners Association jointly developed a new methodology for evaluating the likelihood and consequences of terrorist attacks against refineries and petrochemical facilities. This document is designed for companies to use in assessing vulnerabilities and potential damages from different kinds of terrorist attacks. In the post September 11 era, companies have reevaluated and enhanced security at their facilities. The methodology will provide officials with a new analytical tool to determine "the likelihood of an adversary successfully exploiting vulnerability and the resulting degree of damage or impact." This vulnerability assessment methodology was produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies. Pages: 155

October 2004 | Product Number: OSVA02 | Price: $191.00

Std 1164

Pipeline SCADA Security

Provides guidance to the operators of oil and gas liquids pipeline systems for managing SCADA system integrity and security. The use of this document is not limited to pipelines regulated under Title 49 *CFR* 195.1, but should be viewed as a listing of best practices to be employed when reviewing and developing standards for a SCADA system. This document embodies API's *Security Guidelines for the Petroleum Industry*. This guideline is designed to provide operators with a description of industry practices in SCADA security, and to provide the framework needed to develop sound security practices within the operator's individual companies. It is important that operators understand system vulnerability and risks when reviewing the SCADA system for possible system improvements. The goal of an operator is to control the pipeline such that there are no adverse effects on employees, the environment, the public, or the customers as a result of actions by the operator, or by other parties. This document's main body provides a high-level view of holistic security practices. The annexes provide further details and technical guidance. Reviewing this document and following the guidance set forth in the annexes assists in creating inherently secure operations. Implementation of this standard to advance supervisory control and data acquisition (SCADA) cyber security is a continuous process. The overall process could take years to implement, depending on the complexity of the SCADA system. Additionally, the process would optimally be started as part of a SCADA upgrade project and use this standard to "design in" security as an element of the new system. Pages: 64

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

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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: 38

1st Edition | September 2014 | Product Number: A30001 | Price: $125.00

PIPELINE PUBLIC EDUCATION AND AWARENESS

Get the Dirt
Video

A damage prevention awareness video produced by the Dig Safely team. The video explains the call first process and encourages its use. Available in both English and Spanish.

Single copies free from the API Pipeline Segment: 202-682-8125
Multiple copies available for $1.30 each plus shipping from Revak & Associates: 330-533-1727

Guidelines for Property Development
Brochure

The liquid petroleum pipeline industry has developed these guidelines to improve understanding and increase awareness of the nature of underground pipelines that transport oil, petroleum products, natural gas liquids, and other hazardous liquids and how to conduct land development and use activity near pipeline rights-of-way. The guidelines are intended for use by anyone who is involved in land development, agriculture, and excavation/construction activities near a pipeline. The industry's goal is to protect public safety of the people who live and work along pipeline rights-of-way, protect the environment along rights-of-way, and maintain the integrity of the pipeline so that petroleum products can be delivered to customers safely and without interruption.

A pipeline right-of-way (ROW) is property in which a pipeline company and a landowner both have a legal interest. Each has a right to be there, although each has a different type of use for the land. Pipeline companies are granted permission from private landowners to transport petroleum products across their private lands. That permission is documented in a written agreement called an easement, and it is obtained though purchase, license, or by agreement with the landowner. In cases where the land is owned by the government—whether local, state, or federal—similar arrangements for easements.nd their respective responsibilities for maintaining the safety of this vital, but invisible, transportation system.

November 2009 | Product Number: D0GP04
Price: $67.00 for a packet of 5 | $515.00 for a customized PDF (for more information on the customized PDF, contact API at publications@api.org)

PIPELINE OPERATIONS PUBLICATIONS

RP 1102
Steel Pipelines Crossing Railroads and Highways
(includes Errata 1 dated November 2008, Errata 2 dated May 2010, 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: 39

7th Edition | December 2007 | Reaffirmed: December 2012
Product Number: D11021 | Price: $116.00

Std 1104
Welding of Pipelines and Related Facilities
(includes Addendum 1 dated July 2014, Errata 1 dated April 2014, Errata 2 dated June 2014, Errata 3 dated July 2014, Errata 4 dated November 2015, and Addendum 2 dated May 2016)

Covers the gas and arc welding of butt, fillet, and socket welds in carbon and low-alloy steel piping used in the compression, pumping, and transmission of crude petroleum, petroleum products, fuel gases, carbon dioxide, nitrogen, and where applicable, covers welding on distribution systems. It applies to both new construction and in-service welding. The welding may be done by a shielded metal-arc welding, submerged arc welding, gas tungsten-arc welding, gas metal-arc welding, flux-cored arc welding, plasma arc welding, oxyacetylene welding, or flash butt welding process or by a combination of these processes using a manual, semiautomatic, mechanized, or automatic welding technique or a combination of these techniques. The welds may be produced by position or roll welding or by a combination of position and roll welding.

This standard also covers the procedures for radiographic, magnetic particle, liquid penetrant, and ultrasonic testing, as well as the acceptance standards to be applied to production welds tested to destruction or inspected by radiographic, magnetic particle, liquid penetrant, ultrasonic, and visual testing methods. It is intended that all work performed in accordance with this standard shall meet or exceed the requirements of this standard. Pages: 118

21st Edition | September 2013 | Product Number: D110421 | Price: $345.00

Std 1104 *
Welding of Pipelines and Related Facilities—Kazakh

Kazakh translation of Std 1104.

21st Edition | September 2013
Product Number: D110421K | Price: $276.00

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

Std 1104 *
Welding of Pipelines and Related Facilities—Portuguese

Portuguese translation of Std 1104.

21st Edition | September 2013
Product Number: D110421P | Price: $345.00

Std 1104 *
Welding of Pipelines and Related Facilities—Russian

Russian translation of Std 1104.

21st Edition | September 2013
Product Number: D110421R | Price: $276.00

Std 1104 *
Welding of Pipelines and Related Facilities—Spanish

Spanish translation of Std 1104.

21st Edition | September 2013
Product Number: D110421SP | Price: $345.00

RP 1109
Marking Liquid Petroleum Pipeline Facilities
(includes Errata 1 dated November 2010)

Addresses the permanent marking of liquid petroleum pipeline transportation facilities. It covers the design, message, installation, placement, inspection, and maintenance of markers and signs on pipeline facilities located onshore and at 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: 13

4th Edition | October 2010 | 2-Year Extension: September 2015
Product Number: D11094 | Price: $89.00

RP 1110
Recommended Practice for the Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids, or Carbon Dioxide

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

6th Edition | February 2013 | Product Number: D11106 | Price: $95.00

RP 1111
Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines (Limit State Design)

Sets criteria for the design, construction, testing, operation, and maintenance of offshore steel pipelines used in the production, production support, or transportation of hydrocarbons from the outlet flange of a production facility. The criteria applies to transportation piping facilities located on production platforms after separation and treatment, including meter facilities, gas compression facilities, liquid pumps, and associated piping and appurtenances. This document may also be used for water injection pipelines offshore.

Limit state design has been incorporated into the document to provide a uniform factor of safety with respect to rupture or burst failure as the primary design condition independent of the pipe diameter, wall thickness, and grade. The criteria contained in this document are intended to permit the economical transportation of hydrocarbons while providing for the safety of life and property and the protection of the environment. The general adoption of these criteria should assure that offshore hydrocarbon pipelines possess the requisite structural integrity for their safe and efficient operation. Pages: 67

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

RP 1113
Developing a Pipeline Supervisory Control Center
(supersedes the 3rd Edition of Publ 1113)

Focuses on the design aspects that may be considered appropriate for developing or revamping a control center. A pipeline supervisory control center is a facility where the function of centralized monitoring and controlling of a pipeline system occurs. This document is not all-inclusive. It is intended to cover best practices and provide guidelines for developing a control center only. It does not dictate operational control philosophy or overall SCADA system functionality. This document is intended to apply to control centers for liquids pipelines; however, many of the considerations may also apply to gas control center design. Pages: 10

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

RP 1114
Recommended Practice for the Design of Solution-Mined Underground Storage Facilities

Provides basic guidance on the design and development of new solution-mined underground storage facilities. It is based on the accumulated knowledge and experience of geologists, engineers, and other personnel in the petroleum industry. Users of this guide are reminded that no publication of this type can be complete nor can any written document be substituted for qualified, site-specific engineering analysis. All aspects of solution-mined underground storage are covered, including selecting an appropriate site, physically developing the cavern, and testing and commissioning the cavern. Additionally, a section on plug and abandonment practices is included. This recommended practice does not apply to caverns used for waste disposal purposes. See RP 1115 for guidance in the operation of solution-mined underground storage facilities. Pages: 47

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

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

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

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

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

1st Edition | September 1994 | Reaffirmed: October 2012
Product Number: D11151 | Price: $86.00

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: 33

3rd Edition | July 2008 | Reaffirmed: October 2013
Product Number: D11173 | Price: $132.00

RP 1130
Computational Pipeline Monitoring for Liquids

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

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

RP 1133
Guidelines for Onshore Hydrocarbon Pipelines Affecting High Consequence Floodplains

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

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

1st Edition | February 2005 | Reaffirmed: October 2016
Product Number: D11331 | Price: $82.00

TR 1149
Pipeline Variable Uncertainties and Their Effects on Leak Detectability

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

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

Std 1160
Managing System Integrity for Hazardous Liquid Pipelines
(includes Errata 1 dated September 2013)

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

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

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

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

RP 1161
Recommended Practice for Pipeline Operator Qualification (OQ)

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

3rd Edition | January 2014 | Product Number: D11613 | Price: $210.00

RP 1162
Public Awareness Programs for Pipeline Operators

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

The scope of this RP covers the development, implementation, evaluation, and documentation of public awareness programs associated with the normal operation of existing pipeline systems and facilities, including transmission pipelines, local distribution systems, and gathering lines.

Two important objectives of this RP are to provide a framework to help each pipeline operator create and manage a public awareness program as well as a process for periodic program evaluation to encourage each operator to enhance the program, at the operator's discretion, as circumstances warrant.

Communications related to new pipeline construction, offshore operations, and during emergencies are not covered by this RP, nor is it intended to provide guidance to operators for communications about operator-specific performance measures that are addressed through other means of communication or regulatory reporting.

This RP provides the operator with the elements of a recommended baseline public awareness program and considerations to determine when and how to enhance the program to provide the appropriate level of public awareness outreach. Enhancements may affect messages, delivery frequency and methods, geographic coverage areas, program evaluation, and other elements. Pages: 59

2nd Edition | December 2010 | Reaffirmed: October 2015
Product Number: D11622 | Price: $124.00

Std 1163
In-Line Inspection Systems Qualification

Covers the use of in-line inspection (ILI) systems for onshore and offshore gas and hazardous liquid pipelines. This includes, but is not limited to, tethered, self-propelled, or free flowing systems for detecting metal loss, cracks, mechanical damage, pipeline geometries, and pipeline location or mapping, The standard applies to both existing and developing technologies.

This standard is an umbrella document that provides performance-based requirements for ILI systems, including procedures, personnel, equipment, and associated software. Nothing in this standard is intended to inhibit the use of inspection systems or engineering solutions that are not covered by the standard. This may be particularly applicable where there is innovative developing technology. Where an alternative is offered, the standard may be used, provided any and all variations from the standard are identified and documented. Pages: 79

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

Std 1164
Pipeline SCADA Security

Provides guidance to the operators of oil and gas liquids pipeline systems for managing SCADA system integrity and security. The use of this document is not limited to pipelines regulated under Title 49 *CFR* 195.1, but should be viewed as a listing of best practices to be employed when reviewing and developing standards for a SCADA system. This document embodies API's *Security Guidelines for the Petroleum Industry*. This guideline is designed to provide operators with a description of industry practices in SCADA security, and to provide the framework needed to develop sound security practices within the operator's individual companies. It is important that operators understand system vulnerability and risks when reviewing the SCADA system for possible system improvements. The goal of an operator is to control the pipeline such that there are no adverse effects on employees, the environment, the public, or the customers as a result of actions by the operator, or by other parties. This document's main body provides a high-level view of holistic security practices. The annexes provide further details and technical guidance. Reviewing this document and following the guidance set forth in the annexes assists in creating inherently secure operations. Implementation of this standard to advance supervisory control and data acquisition (SCADA) cyber security is a continuous process. The overall process could take years to implement, depending on the complexity of the SCADA system. Additionally, the process would optimally be started as part of a SCADA upgrade project and use this standard to "design in" security as an element of the new system. Pages: 64

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

RP 1165
Recommended Practice for Pipeline SCADA Displays

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

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

1st Edition | January 2007 | Reaffirmed: July 2012
Product Number: D11651 | Price: $152.00

TR 1166
Excavation Monitoring and Observation for Damage Prevention

Provides a consistently applied decision making process for monitoring and observing of excavation and other activities on or near pipeline Rights-of - Way for "hazardous liquid" and "natural and other gas" transmission pipelines. (NOTE: One call provisions and laws vary by state, and it is the operator's responsibility to be familiar with and comply with all applicable one-call laws.). This document's purpose is to protect the public, excavation employees, and the environment by preventing damage to pipeline assets from excavation activities. Pages: 16

2nd Edition | October 2015 | Product Number: D11662 | Price: $106.00

RP 1167 ■
Pipeline SCADA Alarm Management

Provides pipeline operators with recommended industry practices in the development, implementation, and maintenance of a SCADA alarm management program. It provides guidance on elements that include, but are not limited to, alarm definition, philosophy, documentation, management of change, and auditing. This document is not intended to be a step-by-step set of instructions on how to build an alarm management system. Each pipeline operator has a unique operating philosophy and will therefore have a unique alarm philosophy. This document is intended to outline key elements for review when building an alarm management system. SCADA systems used within the pipeline industry vary in their alarm-related capabilities, and there are many different software systems available to aid in alarm management. It is the responsibility of the pipeline operator to determine the best method to achieve their alarm management goals.

This document uses industry best practices to help to illustrate aspects of alarm management. The scope is intended to be broad. Pages: 39

2nd Edition | June 2016 | Product Number: D116702 | Price: $125.00

RP 1168
Pipeline Control Room Management

Provides pipeline operators and controllers with guidance on control room management best practices to consider when developing or enhancing practices and procedures. This document was written for operators with continuous and non-continuous operations, as applicable. This document addresses four pipeline safety elements for hazardous liquid and natural gas pipelines in both the transportation and distribution sectors: pipeline control room personnel roles, authorities, and responsibilities; guidelines for shift turnover; pipeline control room fatigue management; and pipeline control room management of change. Pages: 19

2nd Edition | February 2015 | Product Number: D11682 | Price: $90.00

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

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

The requirements are organized into the following major sections:

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

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

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

RP 1170
Design and Operation of Solution-Mined Salt Caverns Used for Natural Gas Storage

Provides functional recommendations for salt cavern facilities used for natural gas storage service and covers facility geomechanical assessments, cavern well design and drilling, and solution mining techniques and operations, including monitoring and maintenance practices. The recommended practice is based on the accumulated knowledge and experience of geologists, engineers, and other personnel in the petroleum and gas storage industries and promotes public safety by providing a comprehensive set of design guidelines. The recommended practice recognizes the nature of subsurface geological diversity and stresses the need for in-depth, site-specific geomechanical assessments with a goal of long-term facility integrity and safety.

This recommended practice includes the cavern well system (wellhead, wellbore, and cavern) from the emergency shutdown valve down to the cavern and facilities having significant impact to safety and integrity of the cavern system.

This recommended practice does not apply to caverns used for the storage of liquid or liquefied petroleum products, brine production, or waste disposal; nor to caverns that are mechanically mined, or depleted hydrocarbon or aquifer underground gas storage systems. Pages: 87

1st Edition | July 2015 | Product Number: D117001 | Price: $120.00

RP 1171
Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs

Applies to natural gas storage in depleted oil and gas reservoirs and aquifer reservoirs, and focuses on storage well, reservoir, and fluid management for functional integrity in design, construction, operation, monitoring, maintenance, and documentation practices. Storage design, construction, operation, and maintenance include activities in risk management, site security, safety, emergency preparedness, and procedural documentation and training to embed human and organizational competence in the management of storage facilities. This recommended practice (RP) embodies historical knowledge and experience and emphasizes the need for case-by-case and site-specific conditional assessments.

This RP applies to both existing and newly constructed facilities. Applicable distinctions for aquifer facilities are identified, as necessary. "Replacement," as used in this document, refers to the complete replacement of a facility unit, as, for example, when an existing well is abandoned and replaced with a new well. This document recommends that operators manage integrity through monitoring, maintenance, and remediation practices and apply specific integrity assessments on a case-by-case basis.

The scope does not include pipelines, gas conditioning and liquid handling, compressors, and ancillary facilities associated with storage. Pages: 52

1st Edition | September 2015 | Product Number: D117101 | Price: $120.00

RP 1172
Recommended Practice for Construction Parallel to Existing Underground Transmission Pipelines

Emphasis of these guidelines is on the interaction between existing transmission pipeline operators and those planning to construct in a parallel fashion. These activities may involve many different parties. Contractors working on behalf of the constructing party, including environmental and survey professionals, design engineers, construction contractors, and operators of excavation and earth moving equipment, should engage in work practices that are in conformance with these guidelines and apply vigilance in identifying unanticipated circumstances that may indicate a problem. This RP refers to all of these entities as the "constructing party." These guidelines have been developed such that they can be incorporated into contract documents executed with contractors and subcontractors by whichever party is involved in or responsible for construction activities. Pages: 19

1st Edition | April 2014 | Product Number: D11721 | Price: $85.00

RP 1173
Pipeline Safety Management Systems (ANSI/API RP 1173)

Establishes a pipeline safety management systems (PSMS) framework for organizations that operate hazardous liquids and gas pipelines jurisdictional to the U.S. Department of Transportation. Operators of other pipelines may find this document applicable useful in operating to their systems.

This recommended practice (RP) provides pipeline operators with safety management system requirements that when applied provide a framework to reveal and manage risk, promote a learning environment, and continuously improve pipeline safety and integrity. At the foundation of a PSMS is the operator's existing pipeline safety system, including the operator's pipeline safety processes and procedures. This RP provides a comprehensive framework and defines the elements needed to identify and address safety for a pipeline's life cycle. These safety management system requirements identify what is to be done, and leaves the details associated with implementation and maintenance of the requirements to the individual pipeline operators. The document does not explicitly address personnel safety, environmental protection, and security, but the elements herein can be applied to those aspects of an operation. Pages: 27

1st Edition | July 2015 | Product Number: D117301 | Price: $85.00

RP 1174
Recommended Practice for Onshore Hazardous Liquid Pipeline Emergency Preparedness and Response

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

This RP applies to assets under the jurisdiction of the U.S. Department of Transportation (DOT), specifically U.S. Title 49 *Code of Federal Regulations* (*CFR*) Parts 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: $93.00

RP 1175
Pipeline Leak Detection—Program Management

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

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

This RP focuses on using a risk-based approach to each pipeline operator's LDP and following the guidance set forth assists in creating an inherently risk mitigating LDP management system. The overall goal of the LDP is to detect leaks quickly and with certainty, thus facilitating quicker shutdown and therefore minimizing negative consequences. This RP focuses on management of LDPs, not the design of leak detection systems (LDSs). Pages: 94

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

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

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

This RP presents the pipeline industry's understanding of pipeline cracking. Mechanisms that cause cracking are discussed, methods to estimate the failure pressure of cracks are reviewed, and methods to estimate crack growth are presented. Selection of the appropriate integrity assessment method for various types of cracking, operating conditions, and pipeline characteristics is discussed. This RP also reviews current knowledge about in-line inspection (ILI) technology and in-the-ditch (ITD) nondestructive evaluation technology. A methodology for responding to ILI indications and specific criteria for when to respond to certain results is presented. Applicable repair techniques are reviewed. Sections are included for the discussion of reassessment interval determination and the consideration of appropriate preventive and mitigative measures. Some performance metrics for measuring the effectiveness of a crack management program are discussed. The technical discussion about crack formation, growth, and failure is to provide the knowledge needed by operators to effectively make integrity decisions about managing cracking on their pipeline systems. Pages: 133

1st Edition | July 2016 | Product Number: D117601 | Price: $168.00

RP 2200
Repairing Hazardous Liquid Pipelines

Discusses guidelines to safe practices while repairing in-service pipelines for crude oil, liquefied petroleum gas, highly volatile liquids, and product service. Although it is recognized that the conditions of a particular job will necessitate an on-the-job approaches, the observance of the suggestions in this document should improve the probability that repairs will be completed without accidents or injuries. Pages: 12

5th Edition | September 2015 | Product Number: D22005 | Price: $75.00

PIPELINE MAINTENANCE WELDING

Investigation and Prediction of Cooling Rates During Pipeline Maintenance Welding, and User's Manual for Battelle's Hot-Tap Thermal-Analysis Models

Investigated and improved the methods of predicting cooling rates during pipeline maintenance welding. The scope of this study included

- a review of three previous research efforts to develop satisfactory methods for welding appurtenances to in-service pipelines;
- a survey of pipeline leak and rupture incidents associated with appurtenances;
- the enhancement of existing analytical models for predicting cooling rates and temperatures during welding on an in-service pipeline; and
- a validation of the thermal-analysis models that was achieved by performing welds on pipeline carrying three different liquid-petroleum products.

May 2002 | Product Number: | Version 4.2 | May 2002

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Std 1104
Welding of Pipelines and Related Facilities

(includes Addendum 1 dated July 2014, Errata 1 dated April 2014, Errata 2 dated June 2014, Errata 3 dated July 2014, Errata 4 dated November 2015, and Addendum 2 dated May 2016)

Covers the gas and arc welding of butt, fillet, and socket welds in carbon and low-alloy steel piping used in the compression, pumping, and transmission of crude petroleum, petroleum products, fuel gases, carbon dioxide, nitrogen, and where applicable, covers welding on distribution systems. It applies to both new construction and in-service welding. The welding may be done by a shielded metal-arc welding, submerged arc welding, gas tungsten-arc welding, gas metal-arc welding, flux-cored arc welding, plasma arc welding, oxyacetylene welding, or flash butt welding process or by a combination of these processes using a manual, semiautomatic, mechanized, or automatic welding technique or a combination of these techniques. The welds may be produced by position or roll welding or by a combination of position and roll welding.

This standard also covers the procedures for radiographic, magnetic particle, liquid penetrant, and ultrasonic testing, as well as the acceptance standards to be applied to production welds tested to destruction or inspected by radiographic, magnetic particle, liquid penetrant, ultrasonic, and visual testing methods. It is intended that all work performed in accordance with this standard shall meet or exceed the requirements of this standard. Pages: 118

21st Edition | September 2013
Product Number: D110421 | Price: $345.00

Std 1104 *
Welding of Pipelines and Related Facilities—Kazakh

Kazakh translation of Std 1104.

21st Edition | September 2013
Product Number: D110421K | Price: $276.00

Std 1104 *
Welding of Pipelines and Related Facilities—Portuguese

Portuguese translation of Std 1104.

21st Edition | September 2013
Product Number: D110421P | Price: $345.00

Std 1104 *
Welding of Pipelines and Related Facilities—Russian

Russian translation of Std 1104.

21st Edition | September 2013
Product Number: D110421R | Price: $276.00

Std 1104 *
Welding of Pipelines and Related Facilities—Spanish

Spanish translation of Std 1104.

21st Edition | September 2013
Product Number: D110421SP | Price: $345.00

TANK TRUCK OPERATIONS

For Safety's Sake—MC 306 Cargo Tank Vehicle Inspection

This VHS tape provides a step-by-step approach to pre- and post-trip inspection of MC 306 cargo tank vehicles. The tape follows a driver through an actual walk-around inspection and covers driver recordkeeping and the inspection itself—brakes, lights, mirrors, tires, wiring, the tank, and placards. Also includes common truck defects. The videotape was prepared under the direction of the API Highway Safety Committee and parallels the U.S. Department of Transportation's truck inspection regulations. Two minutes of blank leader is provided on the tape so that it can be customized to fit company training needs. VHS tape: 14 minutes. Pages: 65

January 1989 | Product Number: A11500 | Price: $103.00

RP 1004
Bottom Loading and Vapor Recovery for MC-306 & DOT-406 Tank Motor Vehicles

Provides an industry standard for bottom loading and vapor recovery of proprietary and hired carrier DOT MC-306 tank vehicles at terminals operated by more than one supplier. Guides the manufacturer and operator of a tank vehicle as to the uniform features that should be provided to permit loading of a tank vehicle with a standard 4-in. adapter. This edition of RP 1004 requires an independent secondary control system and maximum requirements for outage in the tank to allow the secondary control system to function. Pages: 21

8th Edition | January 2003 | Reaffirmed: February 2011
Product Number: A10048 | Price: $111.00

RP 1007
Loading and Unloading of MC 306/DOT 406 Cargo Tank Motor Vehicles

Ensuring the safe and efficient loading and delivery of petroleum products to retail service stations and bulk facilities is the primary goal for all companies that transport product. This document is a guideline for use by the truck driver and persons responsible for loading and unloading of MC306/DOT406 cargo tanks. It identifies specific steps to ensure that product can be loaded into tank trucks and unloaded into both underground and aboveground storage tanks in a safe and efficient manner that protects the environment. It is intended to be used in conjunction with existing driver training programs and procedures. Pages: 24

1st Edition | March 2001 | Reaffirmed: February 2011
Product Number: A10071 | Price: $39.00

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

Provides minimum guidelines for developing an emergency response plan for incidents involving hazardous liquid hydrocarbons, such as gasoline and crude oil, transported in MC 306/DOT 406 and MC 307/DOT 407 aluminum cargo tanks, and for coordinating and cooperating with local, state, and federal officials. Covers response plan priorities, personnel training, special equipment, media relations, environmental relations, and post-response activities. The 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
Product Number: A11123 | Price: $76.00

SECURITY

API Standard for Third Party Network Connectivity

Provides guidance for implementing secure third-party connections between the information technology systems and a network of two companies that have a business relationship and a common objective. The standard provides suggestions for companies to follow to establish third-party network connections, while protecting their individual systems and data from unauthorized access or manipulation. Pages: 36

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

Security Guidelines for the Petroleum Industry

API's 3rd Edition of this document is now in use at oil and gas facilities around the world to help managers decide how to deter terrorist attacks. Covering all segments of the industry (production, refining, transportation, pipeline, and marketing), this guidance builds on the existing solid foundation of design and operational regulations, standards, and recommended practices, which relate to facility design and safety, environmental protection, emergency response, and protection from theft and vandalism. Produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies, these guidelines, viewed as a living document, are broadly applicable to facility security in light of September 11, 2001, and provide the starting point for developing security plans at oil and natural gas facilities and operations. Pages: 58

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

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

Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

API and the National Petrochemical & Refiners Association jointly developed a new methodology for evaluating the likelihood and consequences of terrorist attacks against refineries and petrochemical facilities. This document is designed for companies to use in assessing vulnerabilities and potential damages from different kinds of terrorist attacks. In the post September 11 era, companies have reevaluated and enhanced security at their facilities. The methodology will provide officials with a new analytical tool to determine "the likelihood of an adversary successfully exploiting vulnerability and the resulting degree of damage or impact." This vulnerability assessment methodology was produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies. Pages: 155

October 2004 | Product Number: OSVA02 | Price: $191.00

Std 780
Security Risk Assessment Methodology for the Petroleum and Petrochemical Industries

Prepared by a Security Risk Assessment (SRA) Committee of the American Petroleum Institute (API) to assist the petroleum and petrochemical industries in understanding security risk assessment and in conducting SRAs. The standard describes the recommended approach for assessing security risk widely applicable to the types of facilities operated by the industry and the security issues the industry faces. The standard is intended for those responsible for conducting security risk assessments and managing security at these facilities. The method described in this standard is widely applicable to a full spectrum of security issues from theft to insider sabotage to terrorism. The API SRA Methodology was developed for the petroleum and petrochemical industry, for a broad variety of both fixed and mobile applications. This recommended practice describes a single methodology, rather than a general framework for SRAs, but the methodology is flexible and adaptable to the needs of the user. This methodology constitutes one approach for assessing security vulnerabilities at petroleum and petrochemical industry facilities. However, there are other risk assessment techniques and methods available to industry, all of which share common risk assessment elements. Pages: 113

1st Edition | May 2013 | Product Number: K78001 | Price: $190.00

RP 781 ■
Facility Security Plan Methodology for the Oil and Natural Gas Industries

Provides the framework to establish a secure workplace. The plan provides an overview of the threats facing the facility and describes the security measures and procedures designed to mitigate risk and protect people, assets, operations, and company reputation. This API standard was prepared with guidance and direction from the API Security Committee, to assist the petroleum and petrochemical industries in the preparation of a Facility Security Plan (FSP). This standard specifies the requirements for preparing an FSP as well as a discussion of the typical elements included in an FSP.

This standard is intended to be flexible and adaptable to the needs of the user. It is noted that the content of an FSP can vary depending on circumstances such as facility size, location, and operations. This methodology is one approach for preparing an FSP at petroleum and petrochemical facilities. There are other security plan formats available for the industry. It is the responsibility of the user to choose the format and content of the FSP that best meets the needs of a specific facility. The format and content of some FSPs should be dictated by government regulations for covered facilities. This standard is not intended to 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: $145.00

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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.

INSPECTION OF REFINERY EQUIPMENT

API 510 ◆

Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration

Covers the in-service inspection, repair, alteration, and rerating activities for pressure vessels and the pressure-relieving devices protecting these vessels. This inspection code applies to most refining and chemical process vessels that have been placed in service. This includes:

- vessels constructed in accordance with an applicable construction code;
- vessels constructed without a construction code (non-code)—a vessel not fabricated to a recognized construction code and meeting no known recognized standard;
- vessels constructed and approved as jurisdictional special based upon jurisdiction acceptance of particular design, fabrication, inspection, testing, and installation;
- non-standard vessels—a vessel fabricated to a recognized construction code but has lost its nameplate or stamping. Pages: 71

10th Edition | May 2014 | Product Number: C51010 | Price: $225.00

API 510 *

Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration—Chinese

Chinese translation of API 510.

10th Edition | May 2014 | Product Number: C51010C | Price: $158.00

API 510 *■

Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration—Spanish

Spanish translation of API 510.

10th Edition | May 2014 | Product Number: C51010S | Price: $225.00

API 570 ◆■

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

Covers inspection, rating, repair, and alteration procedures for metallic and fiberglass reinforced plastic (FRP) piping systems and their associated pressure relieving devices that have been placed in service. This inspection code applies to all hydrocarbon and chemical process piping covered in 1.2.1 that have been placed in service unless specifically designated as optional per 1.2.2. This publication does not cover inspection of specialty equipment including instrumentation, exchanger tubes, and control valves. However, this piping code could be used by owner/users in other industries and other services at their discretion. Process piping systems that have been retired from service and abandoned in place are no longer covered by this "in-service inspection" Code. However abandoned in place piping may still need some amount of inspection and/or risk mitigation to assure that it does not become a process safety hazard because of continuing deterioration. Process piping systems that are temporarily out of service but have been mothballed (preserved for potential future use) are still covered by this Code. Pages: 88

4th Edition | February 2016 | Product Number: C57004 | Price: $180.00

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: 362

2nd Edition | April 2011 | 2-Year Extension: May 2016
Product Number: C57102 | Price: $329.00

RP 571 *

Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Chinese

Chinese translation of RP 571.

2nd Edition | April 2011 | Product Number: C57102C | Price: $231.00

RP 572 ◆■

Inspection Practices for Pressure Vessels

Supplements API 510 by providing pressure vessel inspectors with information that can improve skills and increase basic knowledge of inspection practices. This recommended practice (RP) describes inspection practices for the various types of pressure vessels (e.g. drums, heat exchangers, columns, reactors, air coolers, spheres) used in petroleum refineries and chemical plants. This RP addresses vessel components, inspection planning processes, inspection intervals, methods of inspection and assessment, methods of repair, records, and reports. API 510 has requirements and expectations for inspection of pressure vessels. Pages: 154

4th Edition | December 2016 | Product Number: C57204 | Price: $230.00

RP 573 ◆

Inspection of Fired Boilers and Heaters

Covers the inspection practices for fired boilers and process heaters (furnaces) used in petroleum refineries and petrochemical plants. The practices described in this document are focused to improve equipment reliability and plant safety by describing the operating variables which impact reliability and to ensure that inspection practices obtain the appropriate data, both on-stream and off-stream, to assess current and future performance of the equipment. Pages: 109

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

RP 574 ◆■

Inspection Practices for Piping System Components

Supplements API 570 by providing piping inspectors with information that can improve skill and increase basic knowledge of inspection practices. This recommended practice describes inspection practices for piping, tubing, valves (other than control valves), and fittings used in petroleum refineries and chemical plants. Common piping components, valve types, pipe joining methods, inspection planning processes, inspection intervals and techniques, and types of records are described to aid the inspectors in fulfilling their role implementing API 570. This publication does not cover inspection of specialty items, including instrumentation, furnace tubulars, and control valves. Pages: 113

4th Edition | November 2016 | Product Number: C57404 | Price: $210.00

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RP 575 ◆
Inspection Practices for Atmospheric and Low-Pressure Storage Tanks

Covers the inspection of atmospheric and low-pressure storage tanks that have been designed to operate at pressures from atmospheric to 15 psig. Includes reasons for inspection, frequency and methods of inspection, methods of repair, and preparation of records and reports. This recommended practice is intended to supplement Std 653, which covers the minimum requirements for maintaining the integrity of storage tanks after they have been placed in service. Pages: 96

3rd Edition | April 2014 | Product Number: C57503 | Price: $190.00

RP 575 *
Inspection Practices for Atmospheric and Low-Pressure Storage Tanks—Chinese

Chinese translation of RP 575.

3rd Edition | April 2014 | Product Number: C57503C | Price: $133.00

RP 576 ◆
Inspection of Pressure-Relieving Devices

Describes the inspection and repair practices for automatic pressure-relieving devices commonly used in the oil and petrochemical industries. As a guide to the inspection and repair of these devices in the user's plant, it is intended to ensure their proper performance. This publication covers such automatic devices as pressure-relief valves, pilot-operated pressure-relief valves, rupture disks, and weight-loaded pressure-vacuum vents.

The scope of this RP includes the inspection and repair of automatic pressure-relieving devices commonly used in the oil and petrochemical industry. This publication does not cover weak seams or sections in tanks, explosion doors, fusible plugs, control valves, and other devices that either depend on an external source of power for operation or are manually operated. Inspections and tests made at manufacturers' plants, which are usually covered by codes or purchase specifications, are not covered by this publication.

This publication does not cover training requirements for mechanics involved in the inspection and repair of pressure-relieving devices. Those seeking these requirements should see API 510, which gives the requirements for a quality control system and specifies that the repair organization maintain and document a training program ensuring that personnel are qualified. Pages: 65

3rd Edition | November 2009 | 2-Year Extension: November 2013
Product Number: C57603 | Price: $134.00

RP 576 *
Inspection of Pressure-Relieving Devices—Chinese

Chinese translation of RP 576.

3rd Edition | November 2009 | Product Number: C57603C | Price: $94.00

RP 577 ◆
Welding Processes, Inspection, and Metallurgy

Provides guidance to the API authorized inspector on welding inspection as encountered with fabrication and repair of refinery and chemical plant equipment and piping. Common welding processes, welding procedures, welder qualifications, metallurgical effects from welding, and inspection techniques are described to aid the inspector in fulfilling their role implementing API 510, API 570, Std 653 and RP 582. The level of learning and training obtained from this document is not a replacement for the training and experience required to be an American Welding Society (AWS) Certified Welding Inspector (CWI). Pages: 145

2nd Edition | December 2013| Product Number: C57702 | Price: $225.00

RP 577 *■
Welding Processes, Inspection, and Metallurgy—Chinese

Chinese translation of RP 577.

2nd Edition | December 2013
Product Number: C57702 CN1420 | Price: $158.00

RP 578 ◆
Material Verification Program for New and Existing Alloy Piping Systems

Provides the guidelines for a material and quality assurance system to verify that the nominal composition of alloy components within the pressure envelope of a piping system is consistent with the selected or specified construction materials to minimize the potential for catastrophic release of toxic or hazardous liquids or vapors.

This RP provides the guidelines for material control and material verification programs on ferrous and nonferrous alloys during the construction, installation, maintenance, and inspection of new and existing process piping systems covered by the ASME B31.3 and API 570 piping codes. This RP applies to metallic alloy materials purchased for use either directly by the owner/user or indirectly through vendors, fabricators, or contractors and includes the supply, fabrication, and erection of these materials. Carbon steel components specified in new or existing piping systems are not specifically covered under the scope of this document unless minor/trace alloying elements are critical to component corrosion resistance or similar degradation. Pages: 13

2nd Edition | March 2010 | 2-Year Extension: April 2015
Product Number: C57802 | Price: $129.00

RP 578 *
Material Verification Program for New and Existing Alloy Piping Systems—Chinese

Chinese translation of RP 578.

2nd Edition | March 2010 | Product Number: C57802C | Price: $91.00

RP 578 *
Material Verification Program for New and Existing Alloy Piping Systems—Russian

Russian translation of RP 578.

2nd Edition | March 2010 | Product Number: C57802R | Price: $91.00

API 579-1/ASME FFS-1 ■
Fitness-For-Service

Fitness-For-Service (FFS) assessments are quantitative engineering evaluations that are performed to demonstrate the structural integrity of an in-service component that may contain a flaw or damage or that may be operating under a specific condition that might cause a failure. This standard provides guidance for conducting FFS assessments using methodologies specifically prepared for pressurized equipment.

The guidelines provided in this standard can be used to make run-repair-replace decisions to help determine if components in pressurized equipment containing flaws that have been identified by inspection can continue to operate safely for some period of time. These FFS assessments are currently recognized and referenced by the API Codes and Standards (510, 570, and 653), and by NB-23 as suitable means for evaluating the structural integrity of pressure vessels, piping systems, and storage tanks where inspection has revealed degradation and flaws in the equipment. The methods and procedures in this standard are intended to supplement and augment the requirements in API 510, API 570, API 653, and other post-construction codes that reference FFS evaluations such as NB-23.

The assessment procedures in this standard can be used for FFS assessments and/or rerating of equipment designed and constructed to the following codes: (a) ASME *B&PV Code*, Section VIII, Division 1; (b) ASME *B&PV Code*, Section VIII, Division 2; (c) ASME *B&PV Code*, Section I; (d) ASME B31.1 Piping Code; (e) ASME B31.3 Piping Code; (f) ASME B31.4 Piping Code; (g) ASME B31.8 Piping Code; (h) ASME B31.12 Piping Code; (i) API Std 650; (j) API Std 620; and (k) API Std 530. The assessment procedures in this standard may also be applied to pressure-containing equipment constructed to other recognized codes and standards, including international and internal corporate standards.

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This standard has broad applications since the assessment procedures are based on allowable stress methods and plastic collapse loads for non-crack-like flaws, and the Failure Assessment Diagram Approach for crack-like flaws. The FFS assessment procedures in this standard can be used to evaluate flaws commonly encountered in pressure vessels, piping, and tankage. The procedures are not intended to provide a definitive guideline for every possible situation that may be encountered. However, flexibility is provided to the user in the form of an advanced assessment level to handle uncommon situations that may require a more detailed analysis.

Copies may be purchased in hard copy, CD, or together for the prices listed below. Please note that the CD product is read-only and cannot be copied or printed. Pages: 1292

3rd Edition | June 2016 | Product Number: C57903
Hard Copy Only Price: $1,070.00
CD Only Price: $1,275.00
Hard Copy and CD Price: $1,760.00

API 579-2/ASME FFS-2
Fitness-For-Service Example Problem Manual

Fitness-For-Service (FFS) assessments in API 579-1/ASME FFS-1 are engineering evaluations that are performed to demonstrate the structural integrity of an in-service component that may contain a flaw or damage or that may be operating under specific conditions that could produce a failure. API 579-1/ASME FFS-1 provides guidance for conducting FFS assessments using methodologies specifically prepared for pressurized equipment. The guidelines provided in this standard may be used to make run-repair-replace decisions to help determine if pressurized equipment containing flaws that have been identified by inspection can continue to operate safely for some period of time. These FFS assessments of API 579-1/ASME FFS-1 are currently recognized and referenced by the API Codes and Standards (510, 570, and 653), and by NB-23 as a suitable means for evaluating the structural integrity of pressure vessels, piping systems, and storage tanks where inspection has revealed degradation and flaws in the equipment or where operating conditions suggest that a risk of failure may be present.

Example problems illustrating the use and calculations required for Fitness-For-Service assessments described in API 579-1/ASME FFS-1 are provided in this document. Example problems are provided for all calculation procedures in both SI and U.S. customary units.

An introduction to the example problems in this document is described in Part 2 of this standard. The remaining parts of this document contain the example problems. The parts in this document coincide with the parts in API 579-1/ASME FFS-1. For example, example problems illustrating calculations for local thin areas are provided in Part 5 of this document. This coincides with the assessment procedures for local thin areas contained in Part 5 of API 579-1/ASME FFS-1. Pages: 366

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

RP 580 ◆■
Risk-Based Inspection

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: 94

3rd Edition | February 2016 | Product Number: C58003 | Price: $265.00

RP 581 ■
Risk-Based Inspection Methodology

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: $865.00

API Risk-Based Inspection Software

API RBI software, created by petroleum refinery and chemical plant owner/users for owner/users, finds its basis in API Publication 581, *Base Resource Document—Risk-Based Inspection.* Practical, valuable features are built into the technology, which is based on recognized and generally accepted good engineering practices.

The purposes of the Risk-Based Inspection Program are:

- screen operating units within a plant to identify areas of high risk;
- estimate a risk value associated with the operation of each equipment item in a refinery or chemical process plant based on a consistent methodology;
- prioritize the equipment based on the measured risk;
- design a highly effective inspection program; and
- systematically manage the risks associated with equipment failures.

The RBI method defines the risk of operating equipment as the combination of two separate terms: the consequence of failure and the likelihood of failure.

For more information: e-mail rbi@api.org or call 281-537-8848

RP 582 ■
Welding Guidelines for the Chemical, Oil, and Gas Industries

Provides supplementary guidelines and practices for welding and welding related topics for shop and field fabrication, repair, and modification of the following:

- pressure-containing equipment, such as pressure vessels, heat exchangers, piping, heater tubes, and pressure boundaries of rotating equipment and attachments welded thereto;
- tanks and attachments welded thereto;
- non-removable internals for process equipment;
- structural items attached and related to process equipment;
- other equipment or component items, when referenced by an applicable purchase document.

This document is general in nature and augments the welding requirements of ASME *BPVC* Section IX and similar codes, standards, specifications, and practices, such as those listed in Section 2. The intent of this document is to be inclusive of chemical, oil, and gas industry standards, although there are many areas not covered herein, e.g. pipeline welding and offshore structural welding are intentionally not covered. This document is based on industry experience, and any restrictions or limitations may be waived or augmented by the purchaser. Pages: 38

3rd Edition | May 2016 | Product Number: C58203 | Price: $137.00

RP 583 ◆
Corrosion Under Insulation and Fireproofing

Covers the design, maintenance, inspection, and mitigation practices to address external corrosion under insulation (CUI) and corrosion under fireproofing (CUF). The document discusses the external corrosion of carbon and low alloy steels under insulation and fireproofing, and external chloride stress corrosion cracking (ECSCC) of austenitic and duplex stainless steels under insulation. The document does not cover atmospheric corrosion or corrosion at uninsulated pipe supports, but does discuss corrosion at insulated pipe supports.

The purpose of this RP is to:

- help owner/users understand the complexity of the many CUI/CUF issues,
- provide owner/users with understanding the advantages and limitations of the various NDE methods used to identify CUI and CUF damage,
- provide owner/users with an approach to risk assessment (i.e. likelihood of failure, and consequence of failure) for CUI and CUF damage, and
- provide owner/users guidance on how to design, install, and maintain insulation systems to avoid CUI and CUF damage. Pages: 88

1st Edition | May 2014 | Product Number: C58301 | Price: $170.00

RP 584 ◆
Integrity Operating Windows

Explains the importance of IOWs for process safety management and to guide users in how to establish and implement an IOW program for refining and petrochemical process facilities for the express purpose of avoiding unexpected equipment degradation that could lead to loss of containment. It is not the intent of this document to provide a complete list of specific IOWs or operating variables that might need IOWs for the numerous types of hydrocarbon process units in the industry (though some generic examples are provided in the text and in Appendix A), but rather to provide the user with information and guidance on the work process for development and implementation of IOWs for each process unit. Pages: 35

1st Edition | May 2014 | Product Number: C58401 | Price: $120.00

RP 585 ◆
Pressure Equipment Integrity Incident Investigation

Provides owner/users with guidelines and recommended practices for developing, implementing, sustaining, and enhancing an investigation program for pressure equipment integrity incidents. This recommended practice describes characteristics of an effective investigation and how organizations can learn from pressure equipment integrity incident investigations. This RP is intended to supplement and provide additional guidance for the OSHA Process Safety Management (PSM) Standard 29 *CFR* 1910.119 (m) incident investigation requirements, with a specific focus on incidents caused by integrity failures of pressure equipment. Pages: 41

1st Edition | April 2014 | Product Number: C58501 | Price: $125.00

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

Covers steel storage tanks built to Std 650 and its predecessor Spec 12C. It provides minimum requirements for maintaining the integrity of such tanks after they have been placed in service and addresses inspection, repair, alteration, relocation, and reconstruction.

The scope is limited to the tank foundation, bottom, shell, structure, roof, attached appurtenances, and nozzles to the face of the first flange, first threaded joint, or first welding-end connection. Many of the design, welding, examination, and material requirements of Std 650 can be applied in the maintenance inspection, rating, repair, and alteration of in-service tanks. In the case of apparent conflicts between the requirements of this standard and Std 650 or its predecessor Spec 12C, this standard shall govern for tanks that have been placed in service.

This 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: $235.00

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

Chinese translation of Std 653.

5th Edition | November 2014 | Product Number: C65305C | Price: $165.00

MECHANICAL EQUIPMENT STANDARDS FOR REFINERY SERVICE

Std 610/ISO 13709:2009
Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries
(ANSI/API Std 610)
(includes Errata 1 dated July 2011)

Specifies requirements for centrifugal pumps, including pumps running in reverse as hydraulic power recovery turbines, for use in petroleum, petrochemical, and gas industry process services. This International Standard is applicable to overhung pumps, between bearings pumps, and vertically suspended pumps. Clause 9 provides requirements applicable to specific types of pumps. All other clauses of this International Standard apply to all pump types. Illustrations are provided of the various specific pump types and the designations assigned to each specific pump type. It does not cover sealless pumps.

This edition of API Std 610 is the identical national adoption of ISO 13709:2009. Pages: 205

11th Edition | September 2010 | 2-Year Extension: November 2015
Product Number: CX61011 | Price: $257.00

Std 611
General Purpose Steam Turbines for Petroleum, Chemical, and Gas Industry Services

Covers the minimum requirements for general-purpose steam turbines. These requirements include basic design, materials, related lubrication systems, controls, auxiliary equipment, and accessories. General-purpose turbines are horizontal or vertical turbines used to drive equipment that is usually spared, is relatively small in size, or is in non-critical service. They are generally used where steam conditions will not exceed a pressure of 48 bar (700 psig) and a temperature of 400C (750F) or where speed will not exceed 6000 rpm. This standard does not cover special-purpose turbines. Pages: 118

5th Edition | March 2008 | Reaffirmed: February 2014
Product Number: C61105 | Price: $147.00

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Std 612
Petroleum Petrochemical and Natural Gas Industries—Steam Turbines—Special-Purpose Applications

Specifies the minimum requirements for steam turbines for special-purpose applications for use in the petroleum, petrochemical, and natural gas industries. These requirements include basic design, materials, fabrication, inspection testing, and preparation for shipment. It also covers the related lube oil systems, instrumentation, control systems, and auxiliary equipment. It is not applicable to general-purpose steam turbines, which are covered in Std 611. Pages: 146

7th Edition | August 2014 | Product Number: C61207 | Price: $220.00

Std 613
Special Purpose Gear Units for Petroleum, Chemical and Gas Industry Services
(ANSI/API Std 613)
(includes Errata 1 dated December 2005)

Covers the minimum requirements for special-purpose, enclosed, precision single- and double-helical one-and two-stage speed increasers and reducers of parallel-shaft design for refinery services. Primarily intended for gear units that are in continuous service without installed spare equipment. Pages: 94

5th Edition | February 2003 | Reaffirmed: August 2007
Product Number: C61305 | Price: $165.00

Std 614/ISO 10438-1:2007
Lubrication, Shaft-Sealing and Oil-Control Systems and Auxiliaries
(ANSI/API Std 614)
(includes Errata 1 dated May 2008)

Covers the minimum requirements for General Purpose and Special Purpose Oil Systems. The standard also includes requirements for Self-acting Gas Seal Support Systems. The standard includes the systems' components, along with the required controls and instrumentation. Chapters included in Std 614 are: 1. General Requirements; 2. Special-purpose Oil Systems; 3. General-purpose Oil Systems; and 4. Self-acting Gas Seal Support Systems.

This edition of API Std 614 is the identical national adoption of ISO 10438:2007. Pages: 202

5th Edition | April 2008 | 2-Year Extension: November 2012
Product Number: CX61402 | Price: $293.00

Std 616
Gas Turbines for the Petroleum, Chemical, and Gas Industry Services

Covers the minimum requirements for open, simple, and regenerative-cycle combustion gas turbine units for services of mechanical drive, generator drive, or process gas generation. All auxiliary equipment required for operating, starting, controlling, and protecting gas turbine units are either discussed directly in this standard or referred to in this standard through references to other publications. Specifically, gas turbine units that are capable of firing gas or liquid or both are covered by this standard. This standard covers both industrial and aeroderivative gas turbines. Pages: 168

5th Edition | January 2011 | 2-Year Extension: May 2016
Product Number: C61605 | Price: $206.00

Std 617
Axial and Centrifugal Compressors and Expander-Compressors
(includes Errata 1 dated August 2016)

Covers the minimum requirements for centrifugal compressors used in petroleum, chemical, and gas industry services that handle air or gas, including process gear mounted. Does not apply to fans or blowers that develop less than 34 kPa (5 psi) pressure rise above atmospheric pressure; these are covered by Std 673. This standard also does not apply to packaged, integrally-geared centrifugal air compressors, which are covered by Std 672. Pages: 374

8th Edition | September 2014 | Product Number: C61707 | Price: $240.00

Std 618
Reciprocating Compressors for Petroleum, Chemical and Gas Industry Services
(ANSI/API Std 618)
(includes Errata 1 dated November 2009 and Errata 2 dated July 2010)

Covers the minimum requirements for reciprocating compressors and their drivers used in petroleum, chemical, and gas industry services for handling process air or gas with either lubricated or nonlubricated cylinders. Compressors covered by this standard are of low to moderate speed and in critical services. Also covered are related lubricating systems, controls, instrumentation, intercoolers, aftercoolers, pulsation suppression devices, and other auxiliary equipment. Pages: 190

5th Edition | December 2007 | Product Number: C61805 | Price: $181.00

Std 619/ISO 10440-1:2007
Rotary-Type Positive Displacement Compressors for Petroleum, Petrochemical and Natural Gas Industries

Specifies requirements for dry and oil-flooded, helical-lobe rotary compressors used for vacuum or pressure or both in petroleum, petrochemical, and gas industry services. It is intended for compressors that are in special-purpose applications. It is not applicable to general-purpose air compressors, liquid-ring compressors, or vane-type compressors.

This edition of API Std 619 is the identical national adoption of ISO 10440-1:2007. Pages: 135

5th Edition | December 2010 | Product Number: CX61905 | Price: $216.00

Std 670
Machinery Protection Systems

Provides a purchase specification to facilitate the manufacture, procurement, installation, and testing of vibration, axial-position, and bearing temperature monitoring systems for petroleum, chemical, and gas industry services. Covers the minimum requirements for monitoring radial shaft vibration, casing vibration, shaft axial position, and bearing temperatures. It outlines a standardized monitoring system and covers requirements for hardware (sensors and instruments), installation, testing, and arrangement. Pages: 244

5th Edition | November 2014 | Product Number: C67005 | Price: $195.00

Std 671/ISO 10441:2007
Special Purpose Couplings for Petroleum, Chemical and Gas Industry Services

Specifies the requirements for couplings for the transmission of power between the rotating shafts of two machines in special-purpose applications in the petroleum, petrochemical and natural gas industries. Such applications are typically in large and/or high speed machines, in services that can be required to operate continuously for extended periods, are often unspared and are critical to the continued operation of the installation. By agreement, it can be used for other applications or services.

Couplings covered are designed to accommodate parallel (or lateral) offset, angular misalignment and axial displacement of the shafts without imposing unacceptable mechanical loading on the coupled machines. It is applicable to gear, metallic flexible element, quill shaft and torsionally resilient type couplings. Torsional damping and resilient type couplings are detailed in Annex A; gear-type couplings are detailed in Annex B and quill shaft style coupling are detailed in Annex C. Also covers the design, materials of construction, manufacturing quality, inspection and testing special purpose couplings.

This edition of API Std 671 is the identical national adoption of ISO 10441:2007. Pages: 56

4th Edition | August 2007 | Reaffirmed: September 2010
2-Year Extension: November 2015
Product Number: C67104 | Price: $167.00

Std 672
Packaged, Integrally Geared Centrifugal Air Compressors for Petroleum, Chemical, and Gas Industry Services
(includes Errata 1 dated October 2007 and Errata 2 dated July 2010)

Covers the minimum requirements for constant-speed, packaged, general purpose integrally geared centrifugal air compressors, including their accessories. This standard is not applicable to machines that develop a pressure rise of less than 0.35 bar (5.0 psi) above atmospheric pressure, which are classed as fans or blowers. Pages: 136

4th Edition | March 2004 | Reaffirmed: December 2008
Product Number: C67204 | Price: $235.00

Std 673
Centrifugal Fans for Petroleum, Chemical, and Gas Industry Services

Covers the minimum requirements for centrifugal fans for use in petroleum, chemical, and gas industry services. Fan static pressure rise is limited to differential usually not exceeding 130 in. (330 cm) of water equivalent air pressure from a single impeller or each impeller in a two stage fan. This standard does not apply to axial flow, aerial cooler, cooling tower, and ventilation fans and positive displacement blowers.

This standard covers equipment for both general purpose and special purpose applications. The purchaser shall determine which classification applies. Refer to Section 3 for definition of the terms general purpose and special purpose.

Additional or overriding requirements applicable to special purpose applications are included at the end of each section (e.g. 6.7.5, etc.). Pages: 113

3rd Edition | December 2014 | Product Number: C67303 | Price: $170.00

Std 674
Positive Displacement Pumps—Reciprocating
(includes Errata 1 dated May 2014 and Errata 2 dated April 2015)

Covers the minimum requirements for reciprocating positive displacement pumps and pump units for use in the petroleum, petrochemical, and gas industry services. Both direct-acting and power-frame types are included. Controlled-volume pumps, hydraulically driven pumps, and rotary pumps are not included. Pages: 95

3rd Edition | December 2010 | Reaffirmed: November 2016
2-Year Extension: November 2015
Product Number: C67403 | Price: $186.00

Std 675
Positive Displacement Pumps—Controlled Volume for Petroleum, Chemical, and Gas Industry Services
(includes Errata 1 dated June 2014 and Errata 2 dated April 2015)

Covers the minimum requirements for reciprocating, controlled volume pumps, and pump units for use in the petroleum, petrochemical, and gas industry services. These pumps are either hydraulic diaphragm or packed 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 | Product Number: C67503 | Price: $127.00

Std 676
Positive Displacement Pumps—Rotary

Covers the minimum requirements for rotary positive displacement process pumps and pump units for use in the petroleum, petrochemical, and gas industry services. Controlled-volume pumps, hydraulically driven pumps, and positive displacement reciprocating pumps are not included. Pages: 102

3rd Edition | November 2009 | Reaffirmed: March 2015
Product Number: C67603 | Price: $150.00

Std 676 *■
Positive Displacement Pumps—Rotary—Chinese

Chinese translation of Std 676.

3rd Edition | November 2009
Product Number: C67603 CN945 | Price: $105.00

Std 677
General-Purpose Gear Units for Petroleum, Chemical and Gas Industry Services
(includes Errata 1 dated February 2012)

Covers the minimum requirements for general-purpose, enclosed, single, and multistage gear units incorporating parallel shaft helical and right angle spiral bevel gears for the petroleum, chemical, and gas industries. Gears manufactured according to this standard shall be limited to the following pitchline velocities. Helical gears shall not exceed 60 meters per second (12,000 feet per minute), and spiral bevels shall not exceed 40 meters per second (8,000 feet per minute). Typical applications for which this standard is intended are cooling tower water pump systems, forced and induced draft fan systems, and other general-purpose equipment trains. Pages: 84

3rd Edition | April 2006 | Reaffirmed: November 2016
Product Number: C67703 | Price: $165.00

Std 681
Liquid Ring Vacuum Pumps and Compressors for Petroleum, Chemical, and Gas Industry Services

Defines the minimum requirements for the basic design, inspection, testing, and preparation for shipment of liquid ring vacuum pump and compressor systems for service in the petroleum, chemical, and gas industries. It includes both vacuum pump and compressor design and system design. Pages: 86

1st Edition | February 1996 | Reaffirmed: November 2010
2-Year Extension: November 2015
Product Number: C68101 | Price: $142.00

Std 682
Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps

Specifies requirements and gives recommendations for sealing systems for centrifugal and rotary pumps used in the petroleum, natural gas, and chemical industries. See A.1.1 and A.1.2. It is the responsibility of the purchaser or seal vendor to ensure that the selected seal and auxiliaries are suitable for the intended service condition. It is applicable mainly for hazardous, flammable, and/or toxic services where a greater degree of reliability is required for the improvement of equipment availability and the reduction of both emissions to the atmosphere and life-cycle sealing costs. It covers seals for pump shaft diameters from 20 mm (0.75 in.) to 110 mm (4.3 in.). This standard is also applicable to seal spare parts and can be referred to for the upgrading of existing equipment. A classification system for the seal configurations covered by this standard into categories, types, arrangements, and orientations is provided.

This standard is referenced normatively in Std 610. It is applicable to both new and retrofitted pumps and to pumps other than Std 610 pumps (e.g. ASME B73.1, ASME B73.2, and Std 676 pumps). This standard might also be referenced by other machinery standards such as other pumps,

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compressors, and agitators. Users are cautioned that this standard is not specifically written to address all of the potential applications that a purchaser may specify. This is especially true for the size envelope specified for Std 682 seals. The purchaser and seal vendor shall mutually agree on the features taken from this standard and used in the application. Pages: 256

4th Edition | May 2014 | Product Number: C68204 | Price: $255.00

Std 682 *
Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps—Chinese

Chinese translation of Std 682.

4th Edition | May 2014 | Product Number: C68204C | Price: $179.00

RP 684
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 outline the complete lateral and torsional rotordynamics and rotor balancing acceptance program designed by API to ensure equipment mechanical reliability. Background material on the fundamentals of these subjects (including terminology) along with rotor modeling utilized in this analysis is presented for those unfamiliar with the subject. This document is an introduction to the major aspects of rotating equipment vibrations that are addressed during a typical lateral dynamics analysis. Pages: 303

2nd Edition | August 2005 | Reaffirmed: November 2010
Product Number: C68402 | Price: $176.00

Std 685
Sealless Centrifugal Pumps for Petroleum, Petrochemical, and Gas Industry Process Service

Specifies the minimum requirements for sealless centrifugal pumps for use in petroleum, heavy duty petrochemical and gas industry services. This standard is applicable to single stage overhung pumps of two classifications: magnetic drive pumps and canned motor pumps. Pages: 170

2nd Edition | February 2011 | Product Number: C68502 | Price: $206.00

RP 686
Recommended Practice for Machinery Installation and Installation Design

Provides recommended procedures, practices, and checklists for the installation and precommissioning of new, existing, and reapplied machinery and to assist with the installation design of such machinery for petroleum, chemical, and gas industry services facilities. In general, this RP is intended to supplement vendor instructions and the instructions provided by the original equipment manufacturer (OEM) should be carefully followed with regard to equipment installation and checkout. Most major topics of this RP are subdivided into sections of "Installation Design" and "Installation" with the intent being that each section can be removed and used as needed by the appropriate design or installation personnel. Pages: 254

2nd Edition | December 2009 | Reaffirmed: November 2014
Product Number: C68602 | Price: $187.00

RP 687
Rotor Repair

Covers the minimum requirements for the inspection and repair of special purpose rotating equipment rotors, bearings and couplings used in petroleum, chemical, and gas industry service. Pages: 540

1st Edition | September 2001 | Reaffirmed: March 2015
Product Number: C68701 | Price: $267.00

RP 687
Rotor Repair—Data CD

CD-ROM containing all datasheets from RP 687.

1st Edition | September 2001 | Product Number: C68701 | Price: $247.00

RP 688
Pulsation and Vibration Control in Positive Displacement Machinery Systems for Petroleum, Petrochemical, and Natural Gas Industry Services

Provides guidance on the application of pulsation and vibration control requirements found in the API purchasing specifications for positive displacement machinery. The fundamentals of pulsation and piping system analysis are presented in Part 1. Part 2 deals specifically with reciprocating compressors and provides commentary regarding each paragraph of Section 7.9 of Std 618, 5th Edition. Pages 128

1st Edition | April 2012 | Product Number: C68801 | Price: $156.00

Std 689/ISO 14224:2006
Collection and Exchange of Reliability and Maintenance Data for Equipment
(ANSI/API Std 689)

Provides a comprehensive basis for the collection of reliability and maintenance (RM) data in a standard format for equipment in all facilities and operations within the petroleum, natural gas, and petrochemical industries during the operational life cycle of equipment. It describes data-collection principles and associated terms and definitions that constitute "reliability language" that can be useful for communicating operational experience. The failure modes defined in the normative part of this standard can be used as a "reliability thesaurus" for various quantitative as well as qualitative applications. This standard also describes data quality control and assurance practices to provide guidance for the user. Std 689 establishes requirements that any inhouse or commercially available RM data system is required to meet when designed for RM data exchange. Examples, guidelines, and principles for the exchange and merging of such RM data are addressed.

This edition of API Std 689 is the identical national adoption of ISO 14224:2006. Pages: 171

1st Edition | July 2007 | Product Number: CC68901 | Price: $213.00

EQUIPMENT DATASHEETS

Electronically formatted mechanical equipment standards datasheets are now available in electronic format (Excel 5.0 spreadsheets):

All of the following datasheets are available for single user at $59.00 each or for intranet licensing at $308.00 each.

Std 537	2nd Edition	Std 660	9th Edition
Std 546	3rd Edition	Std 670	4th Edition
Std 560	5th Edition	Std 671	4th Edition
Std 610	11th Edition	Std 672	4th Edition
Std 611	5th Edition	Std 673	3rd Edition
Std 612	7th Edition	Std 674	3rd Edition
Std 613	5th Edition	Std 675	3rd Edition
Std 614	5th Edition	Std 676	3rd Edition
Std 616	5th Edition	Std 677	3rd Edition
Std 617	8th Edition	Std 682	4th Edition
Std 618	5th Edition	Std 685	2nd Edition
Std 619	5th Edition		

Mechanical Equipment Residual Unbalance Worksheets

Electronic versions of the residual unbalance worksheets that appear in mechanical equipment standards (Excel) along with instructions (Word).

Price: $115.00

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The API Specification Database

The American Petroleum Institute Specification Database Software™ provides a knowledge-management toolset for the project engineering team. Facilitates the entire equipment specification process including the entry of process data and release to design to the final entry of mechanical datasheets and development of the technical bid specification package. Electronic outputs can be combined to form a master technical specification bid package for quotation and purchasing purposes with a modern tree-view format for ease of navigation. Completed projects provide on-going documentation for plant equipment assets—improving safety and reliability. Available in a full-featured corporate wide Oracle® format or a portable ODBC database format with primary focus on equipment datasheets.

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STORAGE TANKS

Impact of Gasoline Blended with Ethanol on the Long-Term Structural Integrity of Liquid Petroleum Storage Systems and Components

Summarizes the results of a literature review conducted for the American Petroleum Institute on the impact of gasoline blended with ethanol on the long-term structural integrity of liquid petroleum storage systems and components. It is anticipated that the use of ethanol in motor fuels will continue to increase. This has generated interest about the potential long-term structural effects of ethanol on liquid petroleum storage systems, including underground storage tanks (USTs), underground piping, and associated components. The objective of the literature review is to determine the state of industry knowledge and research on the effects of ethanol/gasoline blends on the long-term structural integrity of UST systems and components. This review is intended to assist decision-makers on further research requirements and needed changes or supplements to existing standards for underground storage system components used for storing and dispensing gasoline blended with ethanol. Appendix A may be purchased separately as an electronic database file. The database synopsis' and bibliographic information for all articles reviewed for the project. The report is organized by article index number. Reference numbers cited in this report refer to the article index number. Pages: 25

January 2003 | Executive Summary | Price: $65.00
Appendix A—Literature Review | Price $127.00

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

Covers material, design, fabrication, and testing requirements for vertical, cylindrical, aboveground, closed and open top, bolted steel storage tanks in various standard sizes and capacities for internal pressures approximately atmospheric. This specification is designed to provide the oil production industry with safe and economical bolted tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. This specification is for the convenience of purchasers and manufacturers in ordering and fabricating tanks. Pages: 31

16th Edition | November 2014
Product Number: G12B156 | Price: $120.00

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

Covers material, design, fabrication, and testing requirements for vertical, cylindrical, aboveground, closed top, welded steel storage tanks with internal pressures approximately atmospheric at various sizes and capacities ranging from 500 to 10,000 barrels. Tanks covered by this specification have been designed using established engineering calculations to determine minimum metal thickness and bolting specifications for each size tank filled with water. This specification is designed to provide the oil production industry with tanks of adequate safety and reasonable economy for use in the storage of crude petroleum and other liquids commonly handled and stored by the production segment of the industry. Pages: 27

11th Edition | October 2008 | Effective Date: April 1, 2009
2-Year Extension: November 2015
Product Number: G12D11 | Price: $97.00

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

Chinese translation of Spec 12D.

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

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

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

12th Edition | October 2008 | Effective Date: April 1, 2009
2-Year Extension: November 2015
Product Number: G12F12 | Price: $97.00

Spec 12F *
Specification for Shop Welded Tanks for Storage of Production Liquids—Chinese

Chinese translation of Spec 12F.

12th Edition | October 2008 | Product Number: G12F12C | Price: $68.00

Spec 12P ◆■
Specification for Fiberglass Reinforced Plastic Tanks

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

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

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

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

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

For use as a guide for new tank installations and maintenance of existing tanks, Spec 12R1 contains recommendations for good practices in the collection of well or lease production; gauging; delivery to pipeline carriers for transportation; and other production storage and treatment operations. This recommended practice is intended primarily for application to tanks

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fabricated to Specs 12F, 12D, 12F, and 12P when employed in on-land production service, but its basic principles are applicable to atmospheric tanks of other dimensions and specifications when they are employed in similar oil and gas production, treating, and processing services. It is not applicable to refineries, petrochemical plants, marketing bulk stations, or pipeline storage facilities operated by carriers. Pages: 49

5th Edition | August 1997 | Reaffirmed: April 2008
2-Year Extension: November 2015 | Product Number: G12R15
Price: $132.00

Std 620
Design and Construction of Large, Welded, Low-Pressure Storage Tanks (includes Addendum 1 dated November 2014)

Covers the design and construction of large field-assembled, welded, low-pressure carbon steel above ground storage tanks (including flat-bottom tanks) that have a single vertical axis of 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: 277

12th Edition | October 2013 | Product Number: C62012 | Price: $435.00

Std 620 *
Design and Construction of Large, Welded, Low-Pressure Storage Tanks—Chinese

Chinese translation of Std 620.

12th Edition | October 2013 | Product Number: C62012C | Price: $305.00

Std 625
Tank Systems for Refrigerated Liquefied Gas Storage (includes Addendum 1 dated July 2013, Addendum 2 dated November 2014)

Covers low pressure, aboveground, vertical, and cylindrical tank systems storing liquefied gases requiring refrigeration. This standard provides general requirements on responsibilities, selection of storage concept, performance criteria, accessories/appurtenances, quality assurance, insulation, and commissioning of tank systems. Included are tank systems having a storage capacity of 800 cubic meters (5000 bbls) and larger. 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: $232.00

Std 650 ◆
Welded Tanks for Oil Storage (includes Addendum 1 dated September 2014, Addendum 2 dated January 2016, Errata 1 dated July 2013, and Errata 2 dated December 2014)

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: 498

12th Edition | March 2013 | Product Number: C65012 | Price: $475.00

Std 650 *
Welded Tanks for Oil Storage—Chinese

Chinese translation of Std 650.

12th Edition | March 2013 | Product Number: C65012C | Price: $333.00

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. It is intended to serve only as a guide to persons interested in cathodic protection. Specific cathodic protection designs are not provided. Such designs should be developed by a person thoroughly familiar with cathodic protection practices for aboveground petroleum storage tanks.

This RP does not designate specific practices for every situation because the varied conditions in which tank bottoms are installed preclude standardization of cathodic protection practices. Pages: 46

4th Edition | September 2014| Product Number: C65104 | Price: $125.00

RP 651 *
Cathodic Protection of Aboveground Petroleum Storage Tanks—Chinese

Chinese translation of RP 651.

4th Edition | September 2014 | Product Number: C65104C | Price: $88.00

RP 652 ◆
Linings of Aboveground Petroleum Storage Tank Bottoms (includes Errata 1 dated August 2016)

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.

* 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 recommended practice does not designate specific tank bottom linings for every situation because of the wide variety of service environments. Pages: 24

4h Edition | September 2014 | Product Number: C65204 | Price: $130.00

RP 652 *
Linings of Aboveground Petroleum Storage Tank Bottoms—Chinese

Chinese translation of RP 652.

4h Edition | September 2014 | Product Number: C65204C | Price: $91.00

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

Covers steel storage tanks built to Std 650 and its predecessor Spec 12C. It provides minimum requirements for maintaining the integrity of such tanks after they have been placed in service and addresses inspection, repair, alteration, relocation, and reconstruction.

The scope is limited to the tank foundation, bottom, shell, structure, roof, attached appurtenances, and nozzles to the face of the first flange, first threaded joint, or first welding-end connection. Many of the design, welding, examination, and material requirements of Std 650 can be applied in the maintenance inspection, rating, repair, and alteration of in-service tanks. In the case of apparent conflicts between the requirements of this standard and Std 650 or its predecessor Spec 12C, this standard shall govern for tanks that have been placed in service.

This standard employs the principles of Std 650; however, storage tank owner/operators, based on consideration of specific construction and operating details, may apply this standard to any steel tank constructed in accordance with a tank specification.

This standard is intended for use by organizations that maintain or have access to engineering and inspection personnel technically trained and experienced in tank design, fabrication, repair, construction, and inspection.

This standard does not contain rules or guidelines to cover all the varied conditions which may occur in an existing tank. When design and construction details are not given, and are not available in the as-built standard, details that will provide a level of integrity equal to the level provided by the current edition of Std 650 must be used.

This standard recognizes fitness-for-service assessment concepts for evaluating in-service degradation of pressure containing components. API 579-1/ASME FFS-1, *Fitness-For-Service*, provides detailed assessment procedures or acceptance criteria for specific types of degradation referenced in this standard. When this standard does not provide specific evaluation procedures or acceptance criteria for a specific type of degradation or when this standard explicitly allows the use of fitness-for-service criteria, API 579-1/ASME FFS-1 may be used to evaluate the various types of degradation or test requirements addressed in this standard. Pages: 162

5th Edition | November 2014 | Product Number: C65305 | Price: $235.00

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

Chinese translation of Std 653.

5th Edition | November 2014 | Product Number: C65305C | Price: $165.00

Publ 937
Evaluation of Design Criteria for Storage Tanks with Frangible Roof Joints

Describes research that evaluated the ability of the present Std 650 tank design criteria to ensure the desired frangible joint behavior. Particular questions include:

- evaluation of the area inequality as a method to predict the buckling response of the compression ring,
- effect of roof slope, tank diameter, and weld size on the frangible joint, and
- effect of the relative strength of the roof-to-shell joint compared to the shell-to-bottom joint. Pages: 73

1st Edition | April 1996 | Product Number: C93701 | Price: $135.00

Publ 937-A
Study to Establish Relations for the Relative Strength of API 650 Cone Roof, Roof-to-Shell and Shell-to-Bottom Joints

Investigates the relative strengths of the roof-to-shell and shell-to-bottom joints, with the goal of providing suggestions for frangible roof design criteria applicable to smaller tanks. Pages: 68

1st Edition | August 2005 | Product Number: C937A0 | Price: $122.00

TR 939-D
Stress Corrosion Cracking of Carbon Steel in Fuel Grade Ethanol—Review, Experience Survey, Field Monitoring, and Laboratory Testing
(includes Addendum 1 dated October 2013)

Addresses stress corrosion cracking (SCC) in carbon steel equipment used in distribution, transportation, storage, and blending of denatured fuel ethanol. API, with assistance from the Renewable Fuels Association (RFA), conducted research on the potential for metal cracking and product leakage in certain portions of the fuel ethanol distribution system. TR 939-D contains a review of existing literature, results of an industry survey on cracking events and corrosion field monitoring, and information on mitigation and prevention. Pages: 172

2nd Edition | May 2007 | Product Number: C939D0 | Price: $160.00

Std 2015 ◆
Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks

Applies to stationary atmospheric and low-pressure (up to and including 15 psig) aboveground petroleum storage tanks used in all sectors of the petroleum and petrochemical industry, including:

- crude oil and gas production,
- refining; petrochemicals,
- pipelines and terminals,
- bulk storage, and
- ethanol facilities.

This standard provides requirements for safely planning, coordinating, and conducting tank entry and cleaning operations, from removal from service through return to service. This standard does not and cannot cover every possible unique hazard or situation that may arise during tank cleaning operations. Site, product and tank-specific hazards and situations must be addressed by employers using the appropriate principles and considerations provided for by this standard. Pages: 60

7th Edition | May 2014 | Product Number: K20157 | Price: $150.00

RP 2016 ◆
Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks
(ANSI/API RP 2016)

Supplements the requirements of Std 2015, Seventh Edition. This recommended practice (RP) provides guidance and information on the specific aspects of tank cleaning in order to assist employers (owners/operators and contractors) to conduct safe tank cleaning operations in accordance with the requirements of Std 2015. Pages: 98

1st Edition | August 2001 | Reaffirmed: May 2006
Product Number: K20161 | Price: $192.00

Publ 2026 ◆
Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service

Provides safety information for individuals responsible for performing maintenance or repairs that involve descent onto the floating roofs of petroleum storage tanks. Pages: 15

2nd Edition | April 1998 | Reaffirmed: June 2006
Product Number: K20262 | Price: $62.00

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RP 2027
Ignition Hazards Involved in Abrasive Blasting of Atmospheric Storage Tanks in Hydrocarbon Service

Identifies the ignition hazards involved in abrasive blasting of the exteriors of hydrocarbon storage tanks containing a mixture that is flammable or that can become flammable when air is added. It provides operational guidelines for procedures that significantly reduce ignition risks during abrasive blasting of hydrocarbon tanks that may contain a flammable vapor space. Pages: 4

3rd Edition | March 2002 | Reaffirmed: March 2012
Product Number: C20273 | Price: $74.00

RP 2207 ◆
Preparing Tank Bottoms for Hot Work

Addresses only the safety aspects of hot work on petroleum storage tank bottoms. It discusses safety precautions for preventing fires, explosions, and associated injuries. The term "hot work," as used in this publication, is defined as an operation that can produce a spark or flame hot enough to ignite flammable vapors. Pages: 32

6th Edition | December 2007 | Reaffirmed: March 2012
Product Number: K22076 | Price: $86.00

Std 2510
Design and Construction of LPG Installations

Provides minimum requirements for the design and construction of installations for the storage and handling of liquefied petroleum gas (LPG) at marine and pipeline terminals, natural gas processing plants, refineries, petrochemical plants, and tank farms. This standard covers storage vessels, loading and unloading systems, piping, and related equipment. Pages: 22

8th Edition | May 2001 | Reaffirmed: October 2011
Product Number: C25108 | Price: $103.00

Std 2510 *
Design and Construction of LPG Installations—Spanish

Spanish translation of Std 2510.

8th Edition | May 2001 | Product Number: C25108SP | Price: $103.00

Std 2610
Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities

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

The purpose of this standard is to consolidate a wide base of current industry experience, knowledge, information, and management practices into a cohesive standard comprising a range of best practices. Pages: 53

2nd Edition | May 2005 | Reaffirmed: December 2010
2-Year Extension: May 2016 | Product Number: C26102 | Price: $122.00

PRESSURE-RELIEVING SYSTEMS FOR REFINERY SERVICE

Std 520, Part I
Sizing, Selection, and Installation of Pressure-Relieving Devices—Part I—Sizing and Selection

Applies to the sizing and selection of pressure relief devices used in refineries and related industries for equipment that has a maximum allowable working pressure of 15 psig (103 kPag) or greater. The pressure relief devices covered in this standard are intended to protect unfired pressure vessels and related equipment against overpressure from operating and fire contingencies.

This standard includes basic definitions and information about the operational characteristics and applications of various pressure relief devices. It also includes sizing procedures and methods based on steady state flow of Newtonian fluids. Atmospheric and low-pressure storage tanks covered in Std 2000 and pressure vessels used for the transportation of products in bulk or shipping containers are not within the scope of this standard. See Std 521 for information about appropriate ways of reducing pressure and restricting heat input. The rules for overpressure protection of fired vessels are provided in ASME Section I and ASME B31.1 and are not within the scope of this standard. Pages: 143

9th Edition | July 2014 | Product Number: C520109 | Price: $340.00

Std 520, Part I *
Sizing, Selection, and Installation of Pressure-Relieving Devices—Part I—Sizing and Selection—Russian

Russian translation of Std 520, Part I.

9th Edition | July 2014 | Product Number: C520109R | Price: $272.00

RP 520, Part II
Sizing, Selection, and Installation of Pressure-Relieving Devices—Part II—Installation

Covers the methods of installation for pressure relief devices for equipment that has a maximum allowable working pressure (MAWP) of 15 psig (1.03 bar g) or greater. Pressure relief valves or rupture disks may be used independently or in combination with each other to provide the required protection against excessive pressure accumulation. The term "pressure relief valve" includes safety relief valves used in either compressible or incompressible fluid service, and relief valves used in incompressible fluid service. Covers gas, vapor, steam, and incompressible fluid service. Pages: 55

6th Edition | March 2015 | Product Number: C520206 | Price: $260.00

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: 248

6th Edition | January 2014 | Product Number: C52106 | Price: $275.00

Std 526
Flanged Steel Pressure-Relief Valves
(includes Errata 1 dated May 2009 and Errata 2 dated October 2012)

Purchase specification for flanged steel pressure-relief valves. Basic requirements are given for direct spring-loaded pressure-relief valves and pilot-operated pressure-relief valves as follows:

- orifice designation and area;
- valve size and pressure rating, inlet and outlet;
- materials;
- pressure-temperature limits;

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- center-to-face dimensions, inlet and outlet.

Nameplate nomenclature and requirements for stamping are detailed in Annex A. Pages: 43

6th Edition | April 2009 | 2-Year Extension: April 2015
Product Number: C52606 | Price: $156.00

Std 526 *■
Flanged Steel Pressure-Relief Valves—Russian

Russian translation of Std 526.

6th Edition | April 2009 | Product Number: C52606R | Price: $125.00

Std 527
Seat Tightness of Pressure Relief Valves

Describes methods of determining the seat tightness of metal- and soft-seated pressure relief valves, including those of conventional, bellows, and pilot-operated designs.

The maximum acceptable leakage rates are defined for pressure relief valves with set pressures from 103 kPa gauge (15 psig) to 41,379 kPa gauge (6,000 psig). If greater seat tightness is required, the purchaser shall specify it in the purchase order.

The test medium for determining the seat tightness—air, steam, or water—shall be the same as that used for determining the set pressure of the valve.

For dual-service valves, the test medium—air, steam, or water—shall be the same as the primary relieving medium.

To ensure safety, the procedures outlined in this standard shall be performed by persons experienced in the use and functions of pressure relief valves. Pages: 5

4th Edition | November 2014 | Product Number: C52704 | Price: $90.00

RP 576 ◆
Inspection of Pressure-Relieving Devices

Describes the inspection and repair practices for automatic pressure-relieving devices commonly used in the oil and petrochemical industries. As a guide to the inspection and repair of these devices in the user's plant, it is intended to ensure their proper performance. This publication covers such automatic devices as pressure-relief valves, pilot-operated pressure-relief valves, rupture disks, and weight-loaded pressure-vacuum vents.

The scope of this RP includes the inspection and repair of automatic pressure-relieving devices commonly used in the oil and petrochemical industry. This publication does not cover weak seams or sections in tanks, explosion doors, fusible plugs, control valves, and other devices that either depend on an external source of power for operation or are manually operated. Inspections and tests made at manufacturers' plants, which are usually covered by codes or purchase specifications, are not covered by this publication.

This publication does not cover training requirements for mechanics involved in the inspection and repair of pressure-relieving devices. Those seeking these requirements should see API 510, which gives the requirements for a quality control system and specifies that the repair organization maintain and document a training program ensuring that personnel are qualified. Pages: 65

3rd Edition | November 2009 | 2-Year Extension: November 2013
Product Number: C57603 | Price: $134.00

RP 576 *
Inspection of Pressure-Relieving Devices—Chinese

Chinese translation of RP 576.

3rd Edition | November 2009 | Product Number: C57603C | Price: $94.00

Std 2000
Venting Atmospheric and Low-Pressure Storage Tanks

Covers the normal and emergency vapour venting requirements for aboveground liquid petroleum or petroleum products storage tanks and aboveground and underground refrigerated storage tanks, designed for operation at pressures from full vacuum through 103,4 kPa (ga) [15 psig]. Discussed in this International Standard are the causes of overpressure and vacuum; determination of venting requirements; means of venting; selection, and installation of venting devices; and testing and marking of relief devices.

This International Standard is intended for tanks containing petroleum and petroleum products but it can also be applied to tanks containing other liquids; however, it is necessary to use sound engineering analysis and judgment whenever this International Standard is applied to other liquids.

This International Standard does not apply to external floating-roof tanks. Pages: 87

7th Edition | March 2014 | Product Number: C20007 | Price: $225.00

PIPING 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 and fiberglass reinforced plastic (FRP) piping systems and their associated pressure relieving devices that have been placed in service. This inspection code applies to all hydrocarbon and chemical process piping covered in 1.2.1 that have been placed in service unless specifically designated as optional per 1.2.2. This publication does not cover inspection of specialty equipment including instrumentation, exchanger tubes, and control valves. However, this piping code could be used by owner/users in other industries and other services at their discretion. Process piping systems that have been retired from service and abandoned in place are no longer covered by this "in-service inspection" Code. However abandoned in place piping may still need some amount of inspection and/or risk mitigation to assure that it does not become a process safety hazard because of continuing deterioration. Process piping systems that are temporarily out of service but have been mothballed (preserved for potential future use) are still covered by this Code. Pages: 88

4th Edition | February 2016 | Product Number: C57004 | Price: $180.00

RP 574 ◆■
Inspection Practices for Piping System Components

Supplements API 570 by providing piping inspectors with information that can improve skill and increase basic knowledge of inspection practices. This recommended practice describes inspection practices for piping, tubing, valves (other than control valves), and fittings used in petroleum refineries and chemical plants. Common piping components, valve types, pipe joining methods, inspection planning processes, inspection intervals and techniques, and types of records are described to aid the inspectors in fulfilling their role implementing API 570. This publication does not cover inspection of specialty items, including instrumentation, furnace tubulars, and control valves. Pages: 113

4th Edition | November 2016 | Product Number: C57404 | Price: $210.00

RP 578 ◆
Material Verification Program for New and Existing Alloy Piping Systems

Provides the guidelines for a material and quality assurance system to verify that the nominal composition of alloy components within the pressure envelope of a piping system is consistent with the selected or specified construction materials to minimize the potential for catastrophic release of toxic or hazardous liquids or vapors.

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This recommended practice (RP) provides the guidelines for material control and material verification programs on ferrous and nonferrous alloys during the construction, installation, maintenance, and inspection of new and existing process piping systems covered by the ASME B31.3 and API 570 piping codes. This RP applies to metallic alloy materials purchased for use either directly by the owner/user or indirectly through vendors, fabricators, or contractors and includes the supply, fabrication, and erection of these materials. Carbon steel components specified in new or existing piping systems are not specifically covered under the scope of this document unless minor/trace alloying elements are critical to component corrosion resistance or similar degradation. Pages: 13

2nd Edition | March 2010 | 2-Year Extension: April 2015
Product Number: C57802 | Price: $129.00

RP 578 *
Material Verification Program for New and Existing Alloy Piping Systems—Chinese

Chinese translation of RP 578.

2nd Edition | March 2010 | Product Number: C57802C | Price: $91.00

RP 578 *
Material Verification Program for New and Existing Alloy Piping Systems—Russian

Russian translation of RP 578.

2nd Edition | March 2010 | Product Number: C57802R | Price: $91.00

RP 591
Process Valve Qualification Procedure

Provides recommendations for evaluation of a manufacturer's valve construction and quality assurance program for the purpose of determining a manufacturer's capability to provide new valves manufactured in accordance with the applicable API standards. Qualification of valves under this recommended practice is "manufacturing facility specific" and does not cover valves manufactured by other manufacturing facilities, whether owned by the same manufacturer or a third party. Fugitive emissions testing is outside the scope of this RP. Pages: 22

5th Edition | February 2014 | Product Number: C59105 | Price: $100.00

Std 594 ◆
Check Valves: Flanged, Lug, Wafer, and Butt-Welding

Covers design, materials, face-to-face dimensions, pressure-temperature ratings, and examination, inspection, and test requirements for 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: 21

7th Edition | September 2010 | Effective Date: March 1, 2011
2-Year Extension: November 2015
Product Number: C59407 | Price: $106.00

Std 598 ■
Valve Inspection and Testing

Covers inspection, examination, supplementary examinations, and pressure test requirements for resilient-seated, nonmetallic-seated (e.g. ceramic), and metal-to-metal-seated valves of the gate, globe, plug, ball, check, and butterfly types. Pages: 14

10th Edition | October 2016 | Product Number: C59810 | Price: $96.00

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: 17

7th Edition | January 2013 | Product Number: C59907 | Price: $80.00

Std 599 *■
Metal Plug Valves—Flanged, Threaded, and Welding Ends—Russian

Russian translation of Std 599.

7th Edition | January 2013 | Product Number: C59907R | Price: $64.00

Std 600 ◆
Steel Gate Valves—Flanged and Butt-Welding Ends, Bolted Bonnets

Specifies the requirements for a heavy-duty series of bolted bonnet steel gate valves for petroleum refinery and related applications where corrosion, erosion, and other service conditions would indicate a need for full port openings, heavy wall sections, and large stem diameters.

This standard sets forth the requirements for the following gate valve features:

- bolted bonnet,
- outside screw and yoke,
- rising stems,
- non-rising handwheels,
- single or double gate,
- wedge or parallel seating,
- metallic seating surfaces,
- flanged or butt-welding ends.

It covers valves of the nominal pipe sizes DN:

- 25, 32, 40, 50, 65, 80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1050;

corresponding to nominal pipe sizes NPS:

- 1, $1\ 1/4$, $1\ 1/2$, 2, $2\ 1/2$, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42;

and applies to pressure class designations:

- 150, 300, 600, 900, 1500, 2500. Pages: 33

13th Edition | January 2015 | Effective Date: July 15, 2015
Product Number: C60013 | Price: $135.00

Std 600 *
Steel Gate Valves—Flanged and Butt-Welding Ends, Bolted Bonnets—Chinese

Chinese translation of Std 600.

13th Edition | January 2015 | Product Number: C60013C | Price: $95.00

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Phone Orders: +1 800 854 7179 (Toll-free: U.S. and Canada) **Phone Orders: +1 303 397 7956 (Local and International)**

Std 602 ◆

Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries
(includes Errata 1 dated September 2016)

Specifies the requirements for a series of compact steel gate, globe, and check valves for petroleum and natural gas industry applications.It is applicable to valves of:

- nominal pipe sizes NPS 1/4, NPS 3/8, NPS 1/2, NPS 3/4, NPS 1, NPS 1 1/4, NPS 1 1/2, NPS 2, NPS 2 1/2, NPS 3, and NPS 4;
- corresponding to nominal sizes DN 8, DN 10, DN 15, DN 20, DN 25, DN 32, DN 40, DN 50, DN 65, DN 80, and DN 100.

It is also applicable to pressure designations of Class 150, Class 300, Class 600, Class 800, and Class 1500. Class 800 is not a listed class designation, but is an intermediate class number widely used for socket welding and threaded end compact valves.

It includes provisions for the following valve characteristics.

- Outside screw with rising stems (OS & Y), in sizes 1/4 NPS 4 (8 DN 100) and pressure designations including Class 800.
- Inside screw with rising stems (ISRS), in sizes 1/4 NPS 2 1/2 (8 DN 65) and pressure designations of classes 800.
- Socket welding or threaded ends, in sizes 1/4 NPS 2 1/2 (8 DN 65) and pressure designations of Class 800 and Class 1500.
- Flanged or butt-welding ends, in sizes 1/2 NPS 4 (15 DN 100) and pressure designations of Class 150 through Class 1500, excluding flanged end Class 800.
- Bonnet joint construction—bolted, welded, and threaded with seal weld for classes 1500 and union nut for classes 800.
- Standard and full-bore body seat openings.
- Materials, as specified.
- Testing and inspection.

This publication is applicable to valve end flanges in accordance with ASME B16.5, valve body ends having tapered pipe threads to ASME B1.20.1 or ISO 7-1, valve body ends having socket weld ends to ASME B16.11, and butt-weld connections per the requirements described within this standard. It is applicable to extended body construction in sizes 1/2 NPS 2 (15 DN 50) and pressure designations of Class 800 and Class 1500, and to bellows and bellows assembly construction as may be adaptable to gate or globe valves in sizes 1/4 NPS 2 (8 DN 50). It covers bellows stem seal type testing requirements. Pages: 57

10th Edition | May 2015 | Effective Date: November 19, 2015
Product Number: C60210 | Price: $125.00

Std 603 ◆

Corrosion-Resistant, Bolted Bonnet Gate Valves—Flanged and Butt-Welding Ends

Specifies the requirements for corrosion-resistant bolted bonnet gate valves meeting the requirements of ASME B16.34, Standard Class, for valves having flanged or butt-weld ends in sizes NPS 1/2 through 24, corresponding to nominal pipe sizes in ASME B36.10M, and Classes 150, 300, and 600. Covers requirements for corrosion resistant gate vales for use in process piping applications. Covered are requirements for outside-screw-and-yoke (OS&Y) valves with rising stems, non-rising hand-wheels, bolted bonnets, and various types of gate configurations. Pages: 19

8th Edition | February 2013 | Product Number: C60308 | Price: $80.00

Std 603 *

Corrosion-Resistant, Bolted Bonnet Gate Valves—Flanged and Butt-Welding Ends—Russian

Russian translation of Std 603.

8th Edition | February 2013 | Product Number: C60308R | Price: $64.00

Std 607 ■

Fire Test for Quarter-Turn Valves and Valves Equipped with Nonmetallic Seats

Specifies fire type-testing requirements and a fire type-test method for confirming the pressure-containing capability of quarter-turn valves and other valves with nonmetallic seating under pressure during and after the fire test. It does not cover the testing requirements for valve actuators other than manually operated gear boxes or similar mechanisms when these form part of the normal valve assembly. Other types of valve actuators (e.g. electrical, pneumatic, or hydraulic) may need special protection to operate in the environment considered in this valve test, and the fire testing of such actuators is outside the scope of this standard. Pages: 14

7th Edition | June 2016 | Product Number: C60707 | Price: $97.00

Std 608 ◆

Metal Ball Valves—Flanged, Threaded, and Welding Ends

Specifies the requirements for metal ball valves suitable for petroleum, petrochemical and industrial applications that have butt-welding or flanged ends for NPS 1/2 through NPS 20 and threaded 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: 15

5th Edition | November 2012 | Product Number: C60805 | Price: $109.00

Std 608 *

Metal Ball Valves—Flanged, Threaded, and Welding Ends—Chinese

Chinese translation of Std 608.

5th Edition | November 2012 | Product Number: C60805C | Price: $77.00

Std 608 *■

Metal Ball Valves—Flanged, Threaded, and Welding Ends—Russian

Russian translation of Std 608.

5th Edition | November 2012 | Product Number: C60805R | Price: $88.00

Std 609 ◆■

Butterfly Valves: Double-Flanged, Lug- and Wafer-Type

Covers design, materials, face-to-face dimensions, pressure-temperature ratings, and examination, inspection, and test requirements for gray iron, ductile iron, bronze, steel, nickel-based alloy, or special alloy butterfly valves that provide tight shutoff in the closed position. The following two categories of butterfly valves are included.

Category A—Manufacturer's rated cold working pressure (CWP) butterfly valves, usually with a concentric disc and seat configuration. Sizes covered are NPS 2 to NPS 48 for valves having ASME Class 125 or Class 150 flange bolting patterns.

Category B—ASME Class and pressure-temperature rated butterfly valves that have an offset seat and either an eccentric or a concentric disc configuration. These valves may have a seat rating less than the body rating. For lug and wafer, Class 150, 300, and 600, sizes covered are NPS 3 to NPS 24. For double-flanged long pattern, Class 150, 300, and 600, sizes covered are NPS 3 to NPS 36. For double-flanged short pattern, Class 150 and 300, sizes covered are NPS 3 to NPS 48. For double-flanged short pattern, Class 600, sizes covered are NPS 3 to NPS 24. Pages: 36

8th Edition | February 2016 | Effective Date: August 1, 2016
Product Number: C60908 | Price: $105.00

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

RP 615 ■
Valve Selection Guide

Provides general guidance on valve selection for the hydrocarbon processing industry, which includes refineries and petrochemical, chemical, and liquefied natural gas plants and their various associated processes. Selection guidance is provided for valve types covered by ASME B16.34 and API Valve Standards for the Downstream Segment, which include gate, ball, plug, butterfly, check, and globe valves.

Modulating control valves and pressure-relief valves are outside the scope of this recommended practice. Pages: 36

2nd Edition | August 2016 | Product Number: C61502 | Price: $88.00

RP 621
Reconditioning of Metallic Gate, Globe, and Check Valves

Provides guidelines for reconditioning heavy wall (Std 600 and Std 594 type) carbon steel, ferritic alloy (up to 9 % Cr), stainless steel, and nickel alloy gate, globe, and check valves for ASME pressure classes 150, 300, 400, 600, 900, 1500, and 2500. Guidelines contained in this RP apply to flanged and butt weld cast or forged valves.

This RP does not cover reconditioning or remanufacturing of used or surplus valves intended for resale. The only intent of this RP is to provide guidelines for refurbishing an end user's (owner) valves for continued service in the owner's facility. Valves reconditioned or remanufactured to this RP may not meet API standard requirements for new valves. Pages: 26

3rd Edition | August 2010 | 2-Year Extension: November 2015
Product Number: C62103 | Price: $140.00

RP 621 *
Reconditioning of Metallic Gate, Globe, and Check Valves—Russian

Russian translation of RP 621.

3rd Edition | August 2010 | Product Number: C62103R | Price: $112.00

Std 622
Type Testing of Process Valve Packing for Fugitive Emissions

Specifies the requirements for comparative testing of block valve stem packing for process applications where fugitive emissions are a consideration. Packing(s) shall be suitable for use at –29 °C to 538 °C (–20 °F to 1000 °F). Factors affecting fugitive emissions performance that are considered by this standard include temperature, pressure, thermal cycling, mechanical cycling, and corrosion. Pages: 29

2nd Edition | October 2011 | 2-Year Extension: May 2016
Product Number: C62202 | Price: $140.00

Std 623
Steel Globe Valves—Flanged and Butt-Welding Ends, Bolted Bonnets

Specifies the requirements for a heavy-duty series of bolted bonnet steel globe valves for petroleum refinery and related applications where corrosion, erosion, and other service conditions would indicate a need for heavy wall sections and large stem diameters. This standard sets forth the requirements for the following globe valve features:

- bolted bonnet,
- outside screw and yoke,
- rotating rising stems, and nonrotating rising stems,
- rising handwheels and nonrising handwheels,
- conventional, y-pattern, right-angle,
- stop-check (nonreturn type globe valves in which the disc may be positioned against the seat by action of the stem, but is free to rise as a check valve due to flow from under the disc, when the stem is in a full or partially open position),
- plug, narrow, conical, ball, or guided disc,
- metallic seating surfaces,
- flanged or butt-welding ends.

It covers valves of the nominal pipe sizes NPS:

- 2, $2^1/_2$, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24;

corresponding to nominal pipe sizes DN:

- 50, 65, 80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600;

applies for pressure class designations:

- 150, 300, 600, 900, 1500, 2500. Pages: 27

1st Edition | September 2013 | Product Number: C62301 | Price: $75.00

Std 624
Type Testing of Rising Stem Valves Equipped with Flexible Graphite Packing for Fugitive Emissions

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 Std 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: 12

1st Edition | February 2014 | Product Number: C62401 | Price: $85.00

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. The type testing requirements contained herein are based on elements of EPA Method 21. Valves larger than NPS 24 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. Repacking or resealing of valves is outside the scope of this standard. Pages: 14

1st Edition | October 2016 | Product Number: C64101 | Price: $75.00

ELECTRICAL INSTALLATIONS AND EQUIPMENT

RP 500
Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2
(includes Errata 1 dated January 2014)

Provides guidelines for determining the degree and extent of Class I, Division 1 and Class I, Division 2 locations at petroleum facilities, for the selection and installation of electrical equipment. Basic definitions provided in the *National Electric Code* have been followed in developing this document which applies to the classification of locations for both temporarily and permanently installed electrical equipment. RP 500 is intended to be applied where there may be a risk of ignition due to the presence of flammable gas or vapor, mixed with air under normal atmospheric conditions. Pages: 146

3rd Edition | December 2012 | Product Number: C50003 | Price: $279.00

RP 500 *
Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2—Kazakh

Kazakh translation of RP 500.

3rd Edition | December 2012 | Product Number: C50003K | Price: $224.00

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

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

1st Edition | November 1997 | Reaffirmed: August 2013
Product Number: C50501 | Price: $203.00

RP 540
Electrical Installations in Petroleum Processing Plants

Provides information on electrical installations in petroleum processing plants. It is intended for all individuals and organizations concerned with the safe design, installation, and operation of electrical facilities in petroleum processing plants. Pages: 107

4th Edition | April 1999 | Reaffirmed: August 2013
Product Number: C54004 | Price: $188.00

Std 541
Form-Wound Squirrel Cage Induction Motors—375 kW (500 Horsepower) and Larger

Covers the minimum requirements for all form-wound squirrel-cage induction motors 500 Horsepower and larger for use in petroleum industry services. This standard may be applied to adjustable speed motors and induction generators with appropriate attention to the specific requirements of such applications. Pages: 160

5th Edition | December 2014 | Product Number: C54105 | Price: $190.00

RP 545
Recommended Practice for Lightning Protection of Aboveground Storage Tanks for Flammable or Combustible Liquids

Replaces the requirements of RP 2003 regarding lightning protection for preventing fires in storage tanks with flammable or combustible contents. This recommended practice (RP) provides guidance and information to assist owners/operators with lightning protection for tanks. This RP does not provide complete protection for all possible lightning stroke occurrences. Pages: 12

1st Edition | October 2009 | 2-Year Extension: November 2014
Product Number: C54501 | Price: $101.00

TR 545-A
Verification of Lightning Protection Requirements for Above Ground Hydrocarbon Storage Tanks

Collates a number of research reports investigating the lightning phenomena and the adequacy of lightning protection requirements on above ground hydrocarbon storage tanks. These are as follows:

- review of lightning phenomena and the interaction with above ground storage tanks,
- review of tank base earthing and test current recommendations,
- lightning tests to tank shell/shunt samples,
- visits to oil refinery A and B,
- review of burn-through and hot-spot effects on metallic tank skins from lightning strikes,
- lightning simulation testing to determine the required characteristics for roof bonding cables on external floating roof above ground storage tanks,
- investigative tests on the lightning protection of submerged shunts with parallel roof bonding cables. Pages: 193

1st Edition | October 2009 | Product Number: CLP2009 | Price: $134.00

Std 546
Brushless Synchronous Machines—500 kVA and Larger

Covers the minimum requirements for form- and bar-wound brushless synchronous machines in petroleum-related industry service. The standard has been updated to include both synchronous motors and generators with two different rotor designs:

- the conventional salient-pole rotor with solid or laminated poles, and
- the cylindrical rotor with solid or laminated construction.

Also included are new datasheet guides to help clarify the datasheet requirements. Pages: 191

3rd Edition | September 2008 | 2-Year Extension: November 2013
Product Number: C54603 | Price: $208.00

Std 547 ◆
General-Purpose Form-Wound Squirrel Cage Induction Motors—250 Horsepower and Larger

Covers the requirements for form-wound induction motors for use in general-purpose petroleum, chemical, and other industrial severe duty applications. These motors:

- are rated 250 hp (185 kW) through 3000 hp (2250 kW) for 4, 6, and 8 pole speeds,
- are rated less than 800 hp (600 kW) for two-pole (3000 or 3600 RPM) motors of totally-enclosed construction,
- are rated less than 1250 hp (930 kW) for two-pole motors of WP-II type enclosures,
- drive centrifugal loads, drive loads having inertia values within those listed in NEMA MG 1 Part 20),
- are not induction generators. Pages: 30

1st Edition | January 2005 | Product Number: C54701 | Price: $94.00

HEAT TRANSFER EQUIPMENT STANDARDS FOR REFINERY SERVICE

Std 530
Calculation of Heater-Tube Thickness in Petroleum Refineries

Specifies the requirements and gives recommendations for the procedures and design criteria used for calculating the required wall thickness of new tubes and associated component fittings for fired heaters for the petroleum, petrochemical, and natural gas industries. These procedures are appropriate for designing tubes for service in both corrosive and non-corrosive applications. These procedures have been developed specifically for the design of refinery and related fired heater tubes (direct-fired, heat-absorbing tubes within enclosures). These procedures are not intended to be used for the design of external piping. This standard does not give recommendations for tube retirement thickness; Annex A describes a technique for estimating the life remaining for a heater tube. Pages: 264

7th Edition | April 2015 | Product Number: C53007 | Price: $290.00

RP 534
Heat Recovery Steam Generators

Provides guidelines for the selection and evaluation of heat recovery steam generator (HRSG) systems. Details of related equipment designs are considered only where they interact with the HRSG system design. The document does not provide rules for design, but indicates areas that need attention and offers information and descriptions of HRSG types available to the designer/user for purposes of selecting the appropriate HRSG. Pages: 60

2nd Edition | February 2007 | Reaffirmed: October 2013
2-Year Extension: April 2013 | Product Number: C53402 | Price: $95.00

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

RP 535
Burners for Fired Heaters in General Refinery Services

Provides guidelines for the selection and/or evaluation of burners installed in fired heaters in general refinery services. Details of fired heater and related equipment designs are considered only where they interact with the burner selection. This RP does not provide rules for design, but indicates areas that need attention. It offers information and descriptions of burner types available to the designer/user for purposes of selecting the appropriate burner for a given application.

The burner types discussed are those currently in industry use. It is not intended to imply that other burner types are not available or recommended. Many of the individual features described in these guidelines are applicable to most burner types.

In addition to specification of burners, this RP has been updated to include practical guidelines for troubleshooting in service burners as well as including considerations for safe operation. Pages: 84

3rd Edition | May 2014 | Product Number: C53503 | Price: $150.00

RP 536
Post Combustion NO_x Control for Fired Equipment in General Refinery Services

Covers the mechanical description, operation, maintenance, and test procedures of post-combustion NOx control equipment. It covers the Selective Non-Catalytic Reduction and Selective Catalytic Reduction methods of post-combustion NOx reduction. It does not cover reduced NOx formation through burner design techniques, such as external flue gas recirculation (FGR). Pages: 41

2nd Edition | December 2006 | Reaffirmed: September 2013
Product Number: C53602 | Price: $97.00

Std 537/ISO 25457:2008
Flare Details for General Refinery and Petrochemical Service

Specifies requirements and provides guidance for the selection, design, specification, operation and maintenance of flares and related combustion and mechanical components used in pressure-relieving and vapor-depressurizing systems for the petroleum, petrochemical, and natural gas industries. Although this standard is primarily intended for new flares and related equipment, it is also possible to use it to evaluate existing flare facilities.

This edition of API Std 537 is the identical national adoption of ISO 25457:2008. Pages: 156

2nd Edition | December 2008 | 2-Year Extension: April 2013
Product Number: CX53702 | Price: $217.00

Std 537/ISO 25457:2008 *
Flare Details for General Refinery and Petrochemical Service—Chinese

Chinese translation of Std 537.

2nd Edition | December 2008
Product Number: C53702C | Price: $152.00

RP 538
Industrial Fired Boilers for General Refinery and Petrochemical Service

Specifies requirements and gives recommendations for design, operation, maintenance, and troubleshooting considerations for industrial fired boilers used in refineries and chemical plants. Covers waterside control, combustion control, burner management systems, feedwater preparation, steam purity, emissions, and more.

This recommended practice (RP) is based on the accumulated knowledge and experience of manufacturers and users of industrial fired boilers. It directly meets the business needs of refining and petrochemical industry operator-users, equipment vendors and manufacturers, and contractors. This RP reflects prevailing technical expertise.

This RP does not apply to fire tube boilers, gas turbine exhaust boilers, or fluidized bed boilers. It does not cover boiler mechanical construction, nor does it cover forced circulation boilers. Pages: 348

1st Edition | October 2015 | Product Number: C53801 | Price: $305.00

Std 560 ■
Fired Heaters for General Refinery Service

Specifies requirements and gives recommendations for the design, materials, fabrication, inspection, testing, preparation for shipment, and erection of fired heaters, air preheaters (APHs), fans, and burners for general refinery service. This standard does not apply to the design of steam reformers or pyrolysis furnaces. Pages: 327

5th Edition | February 2016 | Product Number: C56005 | Price: $335.00

RP 573 ◆
Inspection of Fired Boilers and Heaters

Covers the inspection practices for fired boilers and process heaters (furnaces) used in petroleum refineries and petrochemical plants. The practices described in this document are focused to improve equipment reliability and plant safety by describing the operating variables which impact reliability and to ensure that inspection practices obtain the appropriate data, both on-stream and off-stream, to assess current and future performance of the equipment. Pages: 109

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

Std 660
Shell-and-Tube Heat Exchangers

Specifies requirements and gives recommendations for the mechanical design, material selection, fabrication, inspection, testing, and preparation for shipment of shell-and-tube heat exchangers for the petroleum, petrochemical, and natural gas industries. This standard is applicable to the following types of shell-and-tube heat exchangers: heaters, condensers, coolers, and reboilers. This standard is not applicable to vacuum-operated steam surface condensers and feed-water heaters. Pages: 62

9th Edition | March 2015 | Product Number: C66009| Price: $185.00

Std 661
Petroleum, Petrochemical, and Natural Gas Industries—Air-Cooled Heat Exchangers for General Refinery Service
(ANSI/API Std 661)

Gives requirements and recommendations for the design, materials, fabrication, inspection, testing, and preparation for shipment of air-cooled heat exchangers for use in the petroleum, petrochemical, and natural gas industries. This standard is applicable to air-cooled heat exchangers with horizontal bundles, but the basic concepts can also be applied to other configurations. Pages: 147

7th Edition | July 2013 | Product Number: C66107 | Price: $250.00

Std 662, Part 1/ISO 15547-1:2005
Plate Heat Exchangers for General Refinery Services, Part 1—Plate-and-Frame Heat Exchangers
(ANSI/API Std 662, Part 1)

Gives requirements and recommendations for the mechanical design, materials selection, fabrication, inspection, testing, and preparation for shipment of plate-and-frame heat exchangers for use in petroleum, petrochemical and natural gas industries. It is applicable to gasketed, semi-welded and welded plate-and-frame heat exchangers.

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This edition of Std 662-1 is an identical national adoption of ISO 15547-1:2005. Pages: 34

1st Edition | February 2006 | Reaffirmed: February 2011
2-Year Extension: May 2016 | Product Number: CX662101 | Price: $132.00

Std 662, Part 2/ISO 15547-2:2005
Plate Heat Exchangers for General Refinery Services, Part 2—Brazed Aluminum Plate-Fin Heat Exchangers (ANSI/API 662, Part 2)

Gives requirements and recommendations for the mechanical design, materials selection, fabrication, inspection, testing, and preparation for shipment of brazed aluminum plate-fin heat exchangers for use in petroleum, petrochemical and natural gas industries.

This edition of Std 662-2 is an identical national adoption of ISO 15547-2:2005. Pages: 34

1st Edition | February 2006 | Reaffirmed: February 2011
2-Year Extension: May 2016 | Product Number: CX662201 | Price: $132.00

Std 663
Hairpin-Type Heat Exchangers

Specifies requirements and gives recommendations for the mechanical design, materials selection, fabrication, inspection, testing, and preparation for shipment of hairpin heat exchangers for use in the petroleum, petrochemical, and natural gas industries. Hairpin heat exchangers include double-pipe and multi-tube type heat exchangers. Pages: 44

1st Edition | May 2014 | Product Number: C66301 | Price: $175.00

Std 664
Spiral Plate Heat Exchangers

Specifies the requirements and gives recommendations for the mechanical design, materials selection, fabrication, inspection, testing, and preparation for shipment of spiral plate heat exchangers for the petroleum, petrochemical, and natural gas industries. It is applicable to standalone spiral plate heat exchangers and those integral with a pressure vessel. Pages: 39

1st Edition | March 2014 | Product Number: C66401 | Price: $175.00

INSTRUMENTATION AND CONTROL SYSTEMS

RP 551 ■
Process Measurement Instrumentation

Provides procedures for the installation of the more generally used measuring and control instruments and related accessories. Pages: 233

2nd Edition | February 2016 | Product Number: C55102 | Price: $157.00

RP 552
Transmission Systems

Reviews the recommended practices for the installation of electronic and pneumatic measurement and control-signal transmission systems. It does not discuss leased wire, radio, and telemetering transmission. Pages: 39

1st Edition | October 1994 | Reaffirmed: August 2015
2-Year Extension: November 2012
Product Number: C55201 | Price: $109.00

RP 553
Refinery Valves and Accessories for Control and Safety Instrumented Systems

Addresses the special needs of automated valves in refinery services. The knowledge and experience of the industry has been captured to provide proven solutions to well-known problems. This document provides recommended criteria for the selection, specification, and application of piston (i.e. double-acting and spring-return) and diaphragm-actuated (spring-return) control valves. Control valve design considerations are outlined such as valve selection, material selection, flow characteristic evaluation, and valve accessories. It also discusses control valve sizing, fugitive emissions, and consideration of the effects of flashing, cavitation, and noise. Recommendations for emergency block and vent valves, on/off valves intended for safety instrumented systems, and special design valves for refinery services, such as Fluid Catalytic Cracking Unit (FCCU) slide valves and vapor depressurizing systems, are also included in this recommended practice. Pages: 109

2nd Edition | October 2012 | Product Number: C55302 | Price: $145.00

RP 554, Part 1
Process Control Systems, Part 1—Process Control Systems Functions and Functional Specification Development

Addresses the processes required to successfully implement process control systems for refinery and petrochemical services. The major topics addressed in Part 1 is the basic functions that a process control system may need to perform, and recommended methodologies for determining the functional and integration requirements for a particular application. Pages: 32

2nd Edition | July 2007 | Reaffirmed: November 2016
2-Year Extension: November 2012
Product Number: C55402 | Price: $139.00

RP 554, Part 1 *
Process Control Systems, Part 1—Process Control Systems Functions and Functional Specification Development—Russian

Russian translation of RP 554, Part 1.

2nd Edition | July 2007 | Product Number: C55402R | Price: $112.00

RP 554, Part 2
Process Control Systems, Part 2—Process Control System Design

Addresses the processes required to successfully implement process control systems for refinery and petrochemical services. The major topic addressed in Part 2 is practices to select and design the installation for hardware and software required to meet the functional and integration requirements. Pages: 65

1st Edition | October 2008 | Reaffirmed: November 2016
2-Year Extension: November 2012
Product Number: C554201 | Price: $139.00

RP 554, Part 2 *
Process Control Systems, Part 2—Process Control System Design—Russian

Russian translation of RP 554, Part 2.

1st Edition | October 2008 | Product Number: C554201R | Price: $112.00

RP 554, Part 3
Process Control Systems, Part 3—Project Execution and Process Control System Ownership

Addresses the processes required to successfully implement process control systems for refinery and petrochemical services. The major topic addressed in Part 3 is project organization, skills and management required to execute a process control project and then to own and operate a process control system. Pages: 40

1st Edition | October 2008 | Reaffirmed: November 2016
2-Year Extension: November 2012
Product Number: C554301 | Price: $107.00

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API 555
Process Analyzers

Addresses the considerations in the application of analyzers and associated systems, installation, and maintenance. Process monitors that measure and transmit information about chemical composition, physical properties, or chemical properties are known as process analyzer systems. Process analyzers are now used widely in the refining industry for

- monitoring and controlling product quality,
- implementing advanced control strategies in improving process operations,
- enhancing area safety, and
- continuous emission monitoring and environmental measurement of air and water quality. Pages: 314

3rd Edition | June 2013 | Product Number: C55503 | Price: $190.00

RP 556
Instrumentation, Control, and Protective Systems for Gas Fired Heaters

Provides guidelines that specifically apply to instrument, control, and protective system installations for gas fired heaters in petroleum production, refineries, petrochemical, and chemical plants. Includes primary measuring and actuating instruments, controls, alarms, and protective systems as they apply to fired heaters. Not covered in this RP are the following: oil fired and combination fired heaters; water tube boilers which consist of single or multiple burners and are designed for utility operation or where the primary purpose is steam generation; fired steam generators used to recover heat from combustion turbines; oven and furnaces used for the primary purpose of incineration, oxidation, reduction, or destruction of the process medium; water bath or oil bath indirect fired heaters; and CO boilers, pyrolysis furnaces, and other specialty heaters. Pages: 66

2nd Edition | April 2011 | Product Number: C55602 | Price: $152.00

RP 556 *
Instrumentation, Control, and Protective Systems for Gas Fired Heaters—Russian

Russian translation of RP 556.

2nd Edition | April 2011 | Product Number: C55602R | Price: $122.00

RP 557
Guide to Advanced Control Systems

Addresses the implementation and ownership of advanced control systems for refinery purposes. The document also described commonly used practices for the opportunity identification, justification, project management, implementation, and maintenance of advanced control system applications in refinery service. Pages: 45

2nd Edition | October 2013 | Product Number: C55702 | Price: $110.00

TECHNICAL DATA BOOK PETROLEUM REFINING

Electronic Version of the API Technical Data Book

Improve the overall design and operations in today's highly complex petroleum refinery process systems with the API Technical Database. Version 1.0 of the API Technical Database replaces the printed format of the popular API Tech Data Books with a modern Windows interface that is so unique it is patented. This single screen approach provides access to the latest API physical property estimation methods and the software is critically reviewed and approved by the API Technical Data Committee. Included is a database of property data for nearly 900 components, characterization of petroleum fractions, and petroleum fraction distillation interconversions. Users can quickly determine petroleum fraction physical property data such as critical properties, vapor pressure, density, liquid enthalpy, gas enthalpy, heat of vaporization, liquid heat capacity, gas heat capacity, surface tension, liquid viscosity, gas viscosity, liquid thermal conductivity, gas thermal conductivity, and heat of combustion. Temperature-dependant properties can be tabulated and graphed over any range, and distillation interconversions are displayed graphically. This data can then be exported for use in simulation and engineering software programs.

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TECHNICAL DATA BOOK PETROLEUM REFINING: RELATED ITEMS

Reports Issued by Research Project 49
1951

API Research Project 49, Reference Clay Minerals, issued a series of eight reports, as follows:

No. 1, Glossary of Mineral Names

No. 2, Reference Clay Localities-United States

No. 3, Differential Thermal Analysis of Reference Clay Mineral Specimens

No. 4, Reference Clay-Europe

No. 5, Occurrence and Microscopic Examination of Reference Clay Mineral Specimens

No. 6, Electron Micrographs of Reference Clay Minerals

No. 7, Analytical Data on Reference Clay Minerals

No. 8, Infrared Spectra of Clay Minerals

TR 997
Comprehensive Report of API Crude Oil Characterization Measurements

A consortium of API member companies has sponsored a research program consisting of a series of projects on the characterization of crude oils. The goal of this program was to obtain complete sets of assay and thermophysical property data on a few widely varying crude oil refining and refining facilities. This report provides descriptions of the test procedures, discussions of their accuracy, and comprehensive compilation of the data for the crude oils measured under this program. Pages: 129

1st Edition | August 2000 | Product Number: C99701 | Price: $211.00

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

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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: $123.00

Impact of Gasoline Blended with Ethanol on the Long-Term Structural Integrity of Liquid Petroleum Storage Systems and Components

Summarizes the results of a literature review conducted for 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: $65.00
Appendix A—Literature Review | Price $127.00

RP 571 ◆
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry

Provides background information on damage that can occur to equipment in the refining process. It is intended to supplement Risk-Based Inspection (RP 580 and Publ 581) and Fitness-for-Service (API 579-1/ASME FFS-1) technologies developed in recent years by API to manage existing refining equipment integrity. It is also an excellent reference for inspection, operations, and maintenance personnel. This RP covers over 60 damage mechanisms. Each write-up consists of a general description of the damage, susceptible materials, construction, critical factors, inspection method selection guidelines, and control measures. Wherever possible, pictures are included and references are provided for each mechanism. In addition, generic process flow diagrams have been included that contain a summary of the major damage flow mechanism expected for typical refinery process units. Pages: 362

2nd Edition | April 2011 | 2-Year Extension: May 2016
Product Number: C57102 | Price: $329.00

RP 571 *
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Chinese

Chinese translation of RP 571.

2nd Edition | April 2011 | Product Number: C57102C | Price: $231.00

RP 582 ■
Welding Guidelines for the Chemical, Oil, and Gas Industries

Provides supplementary guidelines and practices for welding and welding related topics for shop and field fabrication, repair, and modification of the following:

- pressure-containing equipment, such as pressure vessels, heat exchangers, piping, heater tubes, and pressure boundaries of rotating equipment and attachments welded thereto;
- tanks and attachments welded thereto;
- non-removable internals for process equipment;
- structural items attached and related to process equipment;
- other equipment or component items, when referenced by an applicable purchase document.

This document is general in nature and augments the welding requirements of ASME *BPVC* Section IX and similar codes, standards, specifications, and practices, such as those listed in Section 2. The intent of this document is to be inclusive of chemical, oil, and gas industry standards, although there are many areas not covered herein, e.g. pipeline welding and offshore structural welding are intentionally not covered. This document is based on industry experience, and any restrictions or limitations may be waived or augmented by the purchaser. Pages: 38

3rd Edition | May 2016 | Product Number: C58203 | Price: $137.00

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: $151.00

Publ 932-B
Design, Materials, Fabrication, Operation, and Inspection Guidelines for Corrosion Control in Hydroprocessing Reactor Effluent Air Cooler (REAC) Systems
(includes Errata 1 dated January 2014)

Provides guidance to engineering and plant personnel on equipment and piping design, material selection, fabrication, operation, and inspection practices to manage corrosion and fouling in the wet sections of hydroprocessing reactor effluent systems. The reactor effluent system includes all equipment and piping between the exchanger upstream of the wash water injection point and the cold, low-pressure separator (CLPS). The majority of these systems have an air cooler; however, some systems utilize

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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. Pages: 44

2nd Edition | March 2012 | Product Number: C932B02 | Price: $257.00

RP 934-A

Materials and Fabrication of 2 1/4Cr-1Mo, 2 1/4Cr-1Mo-1/4V, 3Cr-1Mo, and 3Cr-1Mo-1/4V Steel Heavy Wall Pressure Vessels for High-Temperature, High-Pressure Hydrogen Service

(includes Addendum 1 dated February 2010 and Addendum 2 dated March 2012)

Presents materials and fabrication requirements for new 2 1/4Cr and 3Cr steel heavy wall pressure vessels for high-temperature, high-pressure hydrogen service. It applies to vessels that are designed, fabricated, certified, and documented in accordance with ASME *BPVC*, Section VIII, Division 2, including Section 3.4, Supplemental Requirements for Cr-Mo Steels and ASME Code Case 2151, as applicable. This document may also be used as a resource when planning to modify an existing heavy wall pressure vessel.

A newer ASME *BPVC*, Section VIII, Division 3, is available and has higher design allowables; however, it has much stricter design rules (e.g. fatigue and fracture mechanics analyses required) and material testing requirements. It is outside the scope of this document.

Materials covered by this recommended practice are conventional steels, including standard 2 1/4Cr-1Mo and 3Cr-1Mo steels, and advanced steels, which include 2 1/4Cr-1Mo-1/4V, 3Cr-1Mo-1/4V-Ti-B, and 3Cr-1Mo-1/4V-Nb-Ca steels. This document may be used as a reference for the fabrication of vessels made of enhanced steels (steels with mechanical properties augmented by special heat treatments) at purchaser discretion. However, no attempt has been made to cover specific requirements for the enhanced steels. Pages: 19

2nd Edition | May 2008 | 2-Year Extension: November 2013
Product Number: C934A02 | Price: $107.00

RP 934-A *

Materials and Fabrication of 2 1/4Cr-1Mo, 2 1/4Cr-1Mo-1/4V, 3Cr-1Mo, and 3Cr-1Mo-1/4V Steel Heavy Wall Pressure Vessels for High-Temperature, High-Pressure Hydrogen Service—Russian

Russian translation of RP 934-A.

2nd Edition | May 2008 | Product Number: C934A02R | Price: $86.00

TR 934-B

Fabrication Considerations for Vanadium-Modified Cr-Mo Steel Heavy Wall Pressure Vessels

Best practice guideline to be used by fabricators, in conjunction with RP 934-A, when constructing new heavy wall pressure vessels with vanadium-modified Cr-Mo steels intended for service in petroleum refining, petrochemical or chemical facilities. These materials are primarily used in high temperature, high pressure services which contain hydrogen. This 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: 29

1st Edition | April 2011 | Product Number: C934B01 | Price: $135.00

RP 934-C

Materials and Fabrication of 1 1/4CR-1/2Mo Steel Heavy Wall Pressure Vessels for High Pressure Hydrogen Service Operating at or Below 825 °F (441 °C)

Presents materials and fabrication requirements for new 1 1/4Cr-1/2Mo steel heavy wall pressure vessels and heat exchangers for high-temperature, high-pressure hydrogen service. It applies to vessels that are designed, fabricated, certified, and documented in accordance with ASME *BPVC*, Section VIII, Division 1 or Division 2. This document may also be used as a resource for equipment fabricated using 1Cr-1/2Mo Steel. This document may also be used as a 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, the heavy wall is defined as a shell thickness of 2 in. (50 mm) or greater, but less than or equal to 4 in. (100 mm). Integrally reinforced nozzles, flanges, tubesheets, bolted channel covers, etc. can be greater than 4 in. (100 mm). At shell or head thicknesses greater than 4 in. (100 mm), 1 1/4Cr-1/2Mo has been shown to have difficulty meeting the toughness requirements given in this document. Although outside of the scope of this document, it can be used as a resource for vessels down to 1 in. (25 mm) shell thickness with changes defined by the purchaser. This recommended practice is not intended for use for equipment operating above 825 °F (441 °C) or in the creep range. Pages: 15

1st Edition | May 2008 | 2-Year Extension: November 2013
Product Number: C934C01 | Price: $107.00

RP 934-C *

Materials and Fabrication of 1 1/4CR-1/2Mo Steel Heavy Wall Pressure Vessels for High Pressure Hydrogen Service Operating at or Below 825 °F (441 °C)—Russian

Russian translation of RP 934-C.

1st Edition | May 2008 | Product Number: C934C01R | Price: $86.00

TR 934-D

Technical Report on the Materials and Fabrication Issues of 1 1/4Cr-1/2Mo and 1Cr-1/2Mo Steel Pressure Vessels

Numerous 1 1/4Cr-1/2Mo and 1Cr-1/2Mo vessels have been constructed and successfully used in various applications in 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: $135.00

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RP 934-E

Recommended Practice for Materials and Fabrication of $1^1/_4$Cr-$^1/_2$Mo Steel Pressure Vessels for Service Above 825 °F (440 °C)

Includes materials and fabrication requirements for new $1^1/_4$Cr-$^1/_2$Mo steel and 1Cr-$^1/_2$Mo pressure vessels and heat exchangers for high temperature service. It applies to vessels that are designed, fabricated, certified and documented in accordance with ASME *BPVC* Section VIII, Division 1. This document may also be used as a resource when planning to modify existing pressure vessels. The interior surfaces of these pressure vessels may have an austenitic stainless steel, ferritic stainless steel, or nickel alloy weld overlay or cladding to provide additional corrosion resistance. This recommended practice is applicable to wall (shell) thicknesses from 1 in. (25 mm) to 4 in. (100 mm). Integrally reinforced nozzles, flanges, tubesheets, bolted channel covers, etc. can be greater than 4 in. (100 mm). At shell or head thicknesses greater than 4 in. (100 mm), $1^1/_4$Cr-$^1/_2$Mo and 1Cr-$^1/_2$Mo has been shown to have difficulty meeting the toughness requirements given in this document, but this does not preclude the use of this alloy if these properties can be met or if the equipment is designed with stresses below the threshold for brittle fracture. Although outside of the scope, this document can be used as a resource for vessels down to 0.5 in. (12.7 mm) shell thickness with changes defined by the purchaser. Pages: 26

1st Edition | August 2010 | 2-Year Extension: May 2016
Product Number: C934E01 | Price: $107.00

RP 934-E *

Recommended Practice for Materials and Fabrication of $1^1/_4$Cr-$^1/_2$Mo Steel Pressure Vessels for Service Above 825 °F (440 °C)—Russian

Russian translation of RP 934-E.

1st Edition | August 2010 | Product Number: C934E01R | Price: $86.00

RP 934-G ■

Design, Fabrication, Operational Effects, Inspection, Assessment, and Repair of Coke Drums and Peripheral Components in Delayed Coking Units

Includes information and guidance on the practices used by industry practitioners on the design, fabrication, operation, inspection, assessment, and repair of coke drums and peripheral components in delayed coking units. The guidance is general and does not reflect specific details associated with a design offered by licensors of delayed coking technology, or inspection tools, operating devices/components, repairs techniques, and/or engineering assessments offered by contractors. For details associated with the design offered by a licensor or services provided by contractors, the licensor or contractor should be consulted for guidance and recommendations for their design details and operating guidance. This document is a technical report and as such provides generally used practices in industry and is not an API recommended practice for coke drums in delayed coking units. Pages: 57

1st Edition | April 2016 | Product Number: C934G01 | Price: $150.00

Publ 935

Thermal Conductivity Measurement Study of Refractory Castables

Compares the differences between measurement techniques used to develop thermal conductivity of refractory castables. The following procedures were examined: Water Calorimeter, Calorimeter-Pilkington Method, Hot Wire Method, Comparative Thermal Conductivity Method, and Panel Test. The refractory industry uses various methods for measuring and reporting thermal conductivity. The accuracy of reporting and understanding thermal conductivity are vital to developing the most cost effective, efficient, and reliable equipment. The study makes no attempt to rank, classify or assign accuracy to each of the measurement techniques. Pages: 22

1st Edition | September 1999 | Product Number: C93501 | Price: $60.00

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. Pages: 49

4th Edition | June 2014 | Product Number: C93604 | Price: $150.00

Publ 937-A

Study to Establish Relations for the Relative Strength of API 650 Cone Roof, Roof-to-Shell and Shell-to-Bottom Joints

Investigates the relative strengths of the roof-to-shell and shell-to-bottom joints, with the goal of providing suggestions for frangible roof design criteria applicable to smaller tanks. Pages: 68

1st Edition | August 2005 | Product Number: C937A0 | Price: $122.00

Publ 938-A

An Experimental Study of Causes and Repair of Cracking of $1^1/_4$Cr-$^1/_2$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: $164.00

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: $109.00

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. DSSs are finding increasing use in the refining industry, primarily because they often offer an economical combination of strength and corrosion resistance. These stainless steels typically have an annealed structure that is generally half ferrite and half austenite, although the ratios can vary from approximately 35/65 to 55/45. Most refinery applications where DSSs are used are corrosive, and DSSs or other higher alloys are required for adequate corrosion resistance. However, some plants are also starting to consider DSS as a "baseline" material. These plants are using DSS in applications where carbon steel may be acceptable, but DSSs have been shown to be more economical considering their higher strength and better long-term reliability.

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The product forms within the scope are tubing, plate, sheet, forgings, pipe, and fittings for piping, vessel, exchanger, and tank applications. The Third Edition of this report has added castings and hot isostatically-pressed (HIP) components for pumps, valves, and other applications. The limited use of DSSs as a cladding is also briefly covered within the document. Pages: 59

3rd Edition | February 2015 | Product Number: C938C03 | Price: $180.00

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: $156.00

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: $171.00

RP 939-C

Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries

Applies to hydrocarbon process streams containing sulfur compounds, with and without the presence of hydrogen, which operate at temperatures above approximately 450 °F (230 °C) up to about 1000 °F (540 °C). A threshold limit for sulfur content is not provided because within the past decade significant corrosion has occurred in the reboiler/fractionator sections of some hydroprocessing units at sulfur or H_2S levels as low as 1 ppm. Nickel based alloy corrosion is excluded from the scope of this document. While sulfidation can be a problem in some sulfur recovery units, sulfur plant combustion sections and external corrosion of heater tubes due to firing sulfur containing fuels in heaters are specifically excluded from the scope of this document. Pages: 35

1st Edition | May 2009 | 2-Year Extension: November 2013
Product Number: C939C01 | Price: $114.00

TR 939-D

Stress Corrosion Cracking of Carbon Steel in Fuel-Grade Ethanol: Review, Experience Survey, Field Monitoring, and Laboratory Testing (includes Addendum 1 dated October 2013)

Addresses stress corrosion cracking (SCC) in carbon steel equipment used in distribution, transportation, storage, and blending of denatured fuel ethanol. API, with assistance from the Renewable Fuels Association (RFA), conducted research on the potential for metal cracking and product leakage in certain portions of the fuel ethanol distribution system. TR 939-D contains a review of existing literature, results of an industry survey on cracking events and corrosion field monitoring, and information on mitigation and prevention. Pages: 172

2nd Edition | May 2007 | Product Number: C939D0 | Price: $160.00

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: $160.00

RP 941 ■

Steels for Hydrogen Service at Elevated Temperatures and Pressures in Petroleum Refineries and Petrochemical Plants

Summarizes the results of experimental tests and actual data acquired from operating plants to establish practical operating limits for carbon and low alloy steels in hydrogen service at elevated temperatures and pressures. The effects on the resistance of steels to hydrogen at elevated temperature and pressure that result from high stress, heat treating, chemical composition, and cladding are discussed. This recommended practice (RP) does not address the resistance of steels to hydrogen at lower temperatures [below about 400 °F (204 °C)], where atomic hydrogen enters the steel as a result of an electrochemical mechanism.

This RP applies to equipment in refineries, petrochemical facilities, and chemical facilities in which hydrogen or hydrogen-containing fluids are processed at elevated temperature and pressure. The guidelines in this RP can also be applied to hydrogenation plants such as those that manufacture ammonia, methanol, edible oils, and higher alcohols.

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: $140.00

TR 941

The Technical Basis Document for API RP 941

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: $198.00

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: $140.00

RP 945
Avoiding Environmental Cracking in Amine Units

Discusses environmental cracking problems of carbon steel equipment in amine units. This publication provides guidelines for carbon steel construction materials, including, fabrication, inspection, and repair, to help ensure safe and reliable operation. The steels referred to in this document are defined by the ASTM designation system, or equivalent materials contained in other recognized codes or standards. This document is based on current engineering practices and insights from recent industry experience. Pages: 25

3rd Edition | June 2003 | Reaffirmed: April 2008
2-Year Extension: April 2013 | Product Number: C94503 | Price: $101.00

Publ 959
Characterization Study of Temper Embrittlement of Chromium-Molybdenum Steels

Evaluates the temper embrittlement characteristics of Cr-Mo pressure vessel steels. The steels are designated A387 in Part 4 of the ASTM Book of Standards. Most of the samples studied were of Grade 22 (2-$^1/_4$–1Mo) and a few samples of Grades 11 and 21 were also included, (1-$^1/_4$Cr–$^1/_2$Mo, 3Cr–1Mo). The 64 samples studied represented a wide range of commercially available steel, including qualification welds in 1-in. and 6-in. steel plate, large nozzle cut-outs, and randomly-shaped pieces of forging material. These materials received heat treatment typical of hydro-treater reactor fabrication.

The objective of this program was to characterize typical commercial reactor steels and weldments in terms of toughness and other physical properties prior to being placed in service and the changes anticipated in toughness due to long-time service at elevated temperatures.

It is important to note that the materials studied were typical of commercial production and fabrication up to about 1975 and are not representative of plate, forgings, and weld metal having low temper embrittlement susceptibility, generally available after 1975. Pages: 145

1st Edition | January 1982 | Product Number: C95900 | Price: $157.00

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: $65.00
Aviation Turbines Fuels, 2001 | Price: $93.00
Heating Oils, 2002 | Price: $103.00
Motor Gasolines, Winter 2001–2002 | Price: $124.00
Motor Gasolines, Summer 2001 | Price: $124.00
Diesel Fuel Oils, 2002 | Price: $103.00

Magnetic computer tapes of raw data are available upon request. Reports from previous years are also available.

Order these petroleum product surveys from:
TRW Petroleum Technologies
P.O. Box 2543 | Bartlesville, OK 74005
Attn: Cheryl Dickenson
918-338-4419

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: $162.00

Publ 4262
Methanol Vehicle Emissions

December 1990 | Product Number: F42620 | Price: $125.00

PROCESS SAFETY STANDARDS

RP 752
Management of Hazards Associated with Location of Process Plant Permanent Buildings

Provides guidance for managing the risk from explosions, fires and toxic material releases to on-site personnel located in new and existing buildings intended for occupancy. This RP was developed for use at refineries, petrochemical and chemical operations, natural gas liquids extraction plants, natural gas liquefaction plants, and other onshore facilities covered by the OSHA Process Safety Management of Highly Hazardous Chemicals, 29 *CFR* 1910.119.

Buildings covered by this RP are rigid structures intended for permanent use in fixed locations. Tents, fabric enclosures and other soft-sided structures are outside the scope of this document. This 3rd Edition of RP 752:2009 supersedes all previous editions, including the technical data provided in those documents.

Significant research and development of technology pertinent to building siting evaluations has been performed since the publication of the previous editions of RP 752. Examples of updated technology include prediction of

blast damage to buildings, determination of occupant vulnerabilities, and estimates of event frequencies. Prior versions of RP 752 and the technical data included in them should not be used for building siting evaluations. The 2nd Edition of RP 752 covered all building types both permanent and portable. This 3rd Edition of RP 752 does not cover portable buildings. Portable buildings are now covered by RP 753. It is recognized, however, that portable buildings specifically designed for significant blast load represent a potential area of overlap between RP 753 and RP 752. In accordance with 1.3 of this document:

> "Buildings described in API RP 753, Management of Hazards Associated with Location of Process Plant Portable Buildings, First Edition, June 2007, as 'portable buildings specifically designed to resist significant blast loads' and intended for permanent use in a fixed location are covered in this document (API RP 752). All other portable buildings are covered by API RP 753." Pages: 27

3rd Edition | December 2009 | Product Number: K75203 | Price: $141.00

RP 753
Management of Hazards Associated with Location of Process Plant Portable Buildings

Provides guidance for reducing the risk to personnel located in portable buildings from potential explosion, fire and toxic release hazards. While occupied permanent buildings (e.g. control rooms, operator shelters) located near covered process area are typically constructed to be blast and fire resistant, conventional portable buildings (i.e. light wood trailers) are typically not constructed to be blast and fire resistant. Past explosion accidents have demonstrated that occupants of conventional portable buildings are susceptible to injuries from structural failures, building collapse, and building debris and projectiles.

Guidance is provided based on the following principles.

- Locate personnel away from covered process areas consistent with safe and effective operations.
- Minimize the use of occupied portable buildings in close proximity to covered process areas.
- Manage the occupancy of portable building especially during periods of increased risk including unit start up or planned shut-down operations.
- Design, construct, install, and maintain occupied portable buildings to protect occupants against potential hazards.
- Manage the use of portable buildings as an integral part of the design, construction, and maintenance operation of a facility. Pages: 22

1st Edition | June 2007 | Reaffirmed: January 2012
Product Number: K75301 | Price: $141.00

RP 754 ■
Process Safety Performance Indicators for the Refining and Petrochemical Industries
(ANSI/API RP 754)

Identifies leading and lagging process safety indicators useful for driving performance improvement. As a framework for measuring activity, status, or performance, this document classifies process safety indicators into four tiers of leading and lagging indicators. Tiers 1 and 2 are suitable for nationwide public reporting, and Tiers 3 and 4 are intended for internal use at individual facilities. Guidance on methods for development and use of performance indicators is also provided. This recommended practice (RP) was developed for the refining and petrochemical industries, but may also be applicable to other industries with operating systems and processes where loss of containment has the potential to cause harm. Applicability is not limited to those facilities covered by the OSHA Process Safety Management Standard, 29 *CFR* 1910.119, or similar national and international regulations. To enable consistent application of this RP to other refining and petrochemical industry sub segments, informative annexes have been created to define the Applicability and Process definition for those subsegments. The user would substitute the content of those annexes for the referenced sections of this RP: Annex A—Petroleum Pipeline and Terminal Operation, Annex B—Retail Service Stations, and Annex C—Oil and Gas Drilling and Production Operations. Performance indicators identified in this recommended practice are based on the following guiding principles.

- Indicators should drive process safety performance improvement and learning.
- Indicators should be relatively easy to implement and easily understood by all stakeholders (e.g. workers and the public).
- Indicators should be statistically valid at one or more of the following levels: industry, company, and facility. Statistical validity requires a consistent definition, a minimum data set size, a normalization factor, and a relatively consistent reporting pool.
- Indicators should be appropriate for industry, company, or facility level benchmarking. Pages: 118

2nd Edition | April 2016 | Product Number: K75402 | Price: $150.00

RP 755
Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries
(ANSI/API RP 755)

As a result of the U.S. Chemical Safety and Hazard Investigation Board (CSB) investigation of the 2005 BP Texas City incident, the CSB issued several recommendations including the development of an American National Standards Institute standard that develops fatigue prevention guidelines for the refining and petrochemical industries that, at a minimum, limit hours and days of work and address shift work.

Provides guidance to all stakeholders (e.g. employees, managers, supervisors) on understanding, recognizing, and managing fatigue in the workplace. Owners and operators should establish policies and procedures to meet the purpose of this document

Developed for refineries, petrochemical and chemical operations, natural gas liquefaction plants, and other facilities such as those covered by the OSHA Process Safety Management Standard, 29 *CFR* 1910.119. This document is intended to apply to a workforce that is commuting daily to a job location.

Applies to all employees working night shifts, rotating shifts, extended hours/days, or call outs involved in process safety sensitive actions. It should also be considered for others making process safety-sensitive decisions. On-site contractors involved in process safety sensitive actions shall have fatigue risk management systems equivalent to the criteria outlined in this document. Pages: 11

1st Edition | April 2010 | Product Number: K75501 | Price: $83.00

TR 755-1
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: $103.00

RP 756
Management of Hazards Associated with Location of Process Plant Tents

Provides guidance for managing the risk from explosions, fires and toxic material releases to on-site personnel located in tents. The term "tent" is used to describe a wide range of structures and is defined in §3.15. This RP was developed for use at refineries, petrochemical and chemical operations, natural gas liquids extraction plants, natural gas liquefaction plants, and other onshore facilities covered by OSHA 29 *CFR* 1910.119.

The focus of this RP is primarily on process related hazards. However, non-process related hazards may exist which could present risks to tent occupants. Previous accidents have demonstrated that tent occupants are susceptible to injuries from fires originating inside the tent, from tent collapse due to extreme weather, and from falling objects. Some of these hazards are addressed by tent design standards, manufacturer's recommendations, and local regulations. Pages: 25

1st Edition | September 2014 | Product Number: C75601 | Price: $125.00

TR 756-1
Process Plant Tent Responses to Vapor Cloud Explosions—Results of the American Petroleum Institute Tent Testing Program

Beginning in 2011, the American Petroleum Institute (API) 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: $190.00

HEALTH, ENVIRONMENT, AND SAFETY: GENERAL

Cumulative Impact of Environmental Regulations on the U.S. Petroleum Refining, Transportation and Marketing Industries

1st Edition | Product Number: C00015 | available at www.api.org

RP 751
Safe Operation of Hydrofluoric Acid Alkylation Units

The refining industry has long demonstrated that HF acid alkylation units can be operated safely and responsibly. Like many industrial processes, the HF acid alkylation process presents operational risk and must be properly designed, well-maintained and operated to assure safe operation. RP 751 is an industry document that communicates proven industry practices to support the safe operation of an HF acid alkylation unit. The philosophy of this 4th Edition is to build on the previous editions' base of recommendations for HF acid leak prevention, detection, and mitigation with the document section topics of hazard management, operating procedures and worker protection, material inspection and maintenance, transportation and inventory control, relief and utility systems, and risk mitigation. This edition changes some previous provisions from recommendations (should) to requirements (shall) based on regulatory requirements, broad industry acceptance and proven effective industry practices along with the addition of some new recommendations and requirements. The recommendations presented in the document are those that have been found effective or those which are advised for safe operations. Pages: 67

4th Edition | May 2013 | Product Number: K75104 | Price: $150.00

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

Applies to storage tanks associated with marketing, refining, pipeline, and terminals operations and with tanks containing Class I or Class II petroleum liquids and use is recommended for Class III petroleum liquids. This standard addresses overfill protection for petroleum storage tanks. It recognizes that prevention provides the most basic level of protection, thus while using both terms "protection" and "prevention," the document emphasizes prevention. The standard's scope covers overfill (and damage) prevention practices for aboveground storage tanks in petroleum facilities, including refineries, marketing terminals, bulk plants, and pipeline terminals that receive flammable and combustible liquids. The fourth edition continues to build on experience and new technology through the use of management systems. Since operations are the primary overfill prevention safeguard, new definitions and requirements are established for alarms. Risk reduction is also addressed by current and generally accepted industry practices.

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

The purpose of this standard is to assist owner/operators and operating personnel in the prevention of tank overfills by implementation of a comprehensive overfill prevention process (OPP). The goal is to receive product into the intended storage tank without overfill or loss of containment.

This standard does not apply to: underground storage tanks; aboveground tanks of 1320 U.S. gallons (5000 liters) or less; aboveground tanks which comply with PEI 600; pressure vessels; tanks containing non-petroleum liquids; tanks storing LPG and LNG; tanks at service stations; tanks filled exclusively from wheeled vehicles (i.e. tank trucks or railroad tank cars); and tanks covered by OSHA 29 *CFR* 1910.119 and EPA 40 *CFR* 68, or similar regulations. Pages: 47

4th Edition | May 2012 | Product Number: K235004 | Price: $114.00

HEALTH, ENVIRONMENT, AND SAFETY: 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: $65.00

Publ 800
Literature Survey: Subsurface and Groundwater Protection Related to Petroleum Refinery Operations

This report is the principal product of an API-sponsored project to prepare a background basis for the development of further information on subsurface and groundwater protection at refineries. It contains an explanation of how the literature survey was conducted; annotations for pertinent articles; a discussion of applicable federal statutes and regulations; and annotations for pertinent regulatory programs under the 5 principal statutes that apply to refinery operations. Pages: 145

1st Edition | September 1988 | Product Number: C80000 | Price: $92.00

SECURITY

API Standard for Third Party Network Connectivity

Provides guidance for implementing secure third-party connections between the information technology systems and network of two companies that have a business relations and a common objective.

The standard will provide suggestions for companies to establish third-party network connections while protecting their individual systems and data from unauthorized access or manipulation. Pages: 36

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

Security Guidelines for the Petroleum Industry

API's 3rd Edition of this document is now in use at oil and gas facilities around the world to help managers decide how to deter terrorist attacks. Covering all segments of the industry (production, refining, transportation, pipeline, and marketing), this guidance builds on the existing solid foundation of design and operational regulations, standards, and recommended practices, which relate to facility design and safety, environmental protection, emergency response, and protection from theft and vandalism. Produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies, these guidelines, viewed as a living document, are broadly applicable to facility security in light of September 11, 2001 and provide the starting point for developing security plans at oil and natural gas facilities and operations. Pages: 58

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

Security Vulnerability Assessment Methodology for the Petroleum and Petrochemical Industries

API and the National Petrochemical & Refiners Association jointly developed a new methodology for evaluating the likelihood and consequences of terrorist attacks against refineries and petrochemical facilities. This document is designed for companies to use in assessing vulnerabilities and potential damages from different kinds of terrorist attacks. In the post September 11 era, companies have reevaluated and enhanced security at their facilities. The methodology will provide officials with a new analytical tool to determine "the likelihood of an adversary successfully exploiting vulnerability and the resulting degree of damage or impact." This vulnerability assessment methodology was produced in close collaboration with the U.S. Department of Homeland Security and other federal agencies. Pages: 155

October 2004 | Product Number: OSVA02 | Price: $191.00

Std 780
Security Risk Assessment Methodology for the Petroleum and Petrochemical Industries

Prepared by a Security Risk Assessment (SRA) Committee of the American Petroleum Institute (API) to assist the petroleum and petrochemical industries in understanding security risk assessment and in conducting SRAs. The standard describes the recommended approach for assessing security risk widely applicable to the types of facilities operated by the industry and the security issues the industry faces. The standard is intended for those responsible for conducting security risk assessments and managing security at these facilities. The method described in this standard is widely applicable to a full spectrum of security issues from theft to insider sabotage to terrorism. The API SRA Methodology was developed for the petroleum and petrochemical industry, for a broad variety of both fixed and mobile applications. This recommended practice describes a single methodology, rather than a general framework for SRAs, but the methodology is flexible and adaptable to the needs of the user. This methodology constitutes one approach for assessing security vulnerabilities at petroleum and petrochemical industry facilities. However, there are other risk assessment techniques and methods available to industry, all of which share common risk assessment elements. Pages: 113

1st Edition | May 2013 | Product Number: K78001 | Price: $190.00

RP 781 ■
Facility Security Plan Methodology for the Oil and Natural Gas Industries

Provides the framework to establish a secure workplace. The plan provides an overview of the threats facing the facility and describes the security measures and procedures designed to mitigate risk and protect people, assets, operations, and company reputation. This API standard was prepared with guidance and direction from the API Security Committee, to assist the petroleum and petrochemical industries in the preparation of a Facility Security Plan (FSP). This standard specifies the requirements for preparing an FSP as well as a discussion of the typical elements included in an FSP.

This standard is intended to be flexible and adaptable to the needs of the user. It is noted that the content of an FSP can vary depending on circumstances such as facility size, location, and operations. This methodology is one approach for preparing an FSP at petroleum and petrochemical facilities. There are other security plan formats available for the industry. It is the responsibility of the user to choose the format and content of the FSP that best meets the needs of a specific facility. The format and content of some FSPs should be dictated by government regulations for covered facilities. This standard is not intended to 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: $145.00

If you have any questions or comments regarding API standards, please visit www.api.org/standards.

UPSTREAM SAFETY STANDARDS

API HF1
Hydraulic Fracturing Operations—Well Construction and Integrity Guidelines

Provides guidance and highlight industry recommended practices for well construction and integrity for wells that will be hydraulically fractured. The guidance provided here will help to ensure that shallow groundwater aquifers and the environment will be protected, while also enabling economically viable development of oil and natural gas resources. This document is intended to apply equally to wells in either vertical, directional, or horizontal configurations. Maintaining well integrity is a key design principle and design feature of all oil and gas production wells. Maintaining well integrity is essential for the two following reasons.

- To isolate the internal conduit of the well from the surface and subsurface environment. This is critical in protecting the environment, including the groundwater, and in enabling well drilling and production.
- To isolate and contain the well's produced fluid to a production conduit within the well.

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

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

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

API HF2
Water Management Associated with Hydraulic Fracturing

Identifies and describes many of the current industry best practices used to minimize environmental and societal impacts associated with the acquisition, use, management, treatment, and disposal of water and other fluids associated with the process of hydraulic fracturing. While this document focuses primarily on issues associated with hydraulic fracturing pursued in deep shale gas development, it also describes the important distinctions related to hydraulic fracturing in other applications. Moreover, this guidance document focuses on areas associated with the water used for purposes of hydraulic fracturing and does not address other water management issues and considerations associated with oil and gas exploration, drilling, and production. These topics will be addressed in future API documents. Pages: 26

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

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

API HF3
Practices for Mitigating Surface Impacts Associated with Hydraulic Fracturing

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

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

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

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

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

3rd Edition | May 2001 | Reaffirmed: January 2013
Product Number: G49003 | Price: $88.00

RP 49 *
Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide—Kazakh

Kazakh translation of RP 49.

3rd Edition | May 2001 | Product Number: G4903K | Price: $71.00

RP 49 *
Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide—Russian

Russian translation of RP 49.

3rd Edition | May 2001 | Product Number: G04903R | Price: $68.00

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

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

1st Edition | July 2009 | Reaffirmed: December 2015
Product Number: G51R01 | Price: $76.00

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

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

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

3rd Edition | August 1999 | Reaffirmed: January 2013
Product Number: G54003 | Price: $125.00

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

Kazakh translation of RP 54.

3rd Edition | August 1999 | Product Number: G54003K | Price: $100.00

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

Russian translation of RP 54.

3rd Edition | August 1999 | Product Number: G54003R | Price: $100.00

RP 55
Recommended Practice for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide

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

2nd Edition | February 1995 | Reaffirmed: March 2007
Product Number: G55002 | Price: $115.00

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: $130.00

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

RP 67
Recommended Practice for Oilfield Explosives Safety

Applies to explosives used in oil and gas well operations, more specifically, explosives used inside the wellborne. Guidance is provided for explosives transportation, on-site explosives loading and unloading operations, electrical wireline operations, tubing conveyed operations, self-contained activating tools, setting tools, sidewall sample taker tools, select fire perforating guns, and bullet perforating guns. Recommendations are presented regarding surface equipment and downhole equipment. Recommended training and minimum qualifications are presented for personnel who participate in handling and using explosives at the well site. Pages: 18

2nd Edition | May 2007 | Reaffirmed: January 2015
Product Number: G06702 | Price: $85.00

RP 67 *
Recommended Practice for Oilfield Explosives Safety—Kazakh

Kazakh translation of RP 67.

2nd Edition | May 2007 | Product Number: G06702K | Price: $68.00

RP 67 *
Recommended Practice for Oilfield Explosives Safety—Russian

Russian translation of RP 67.

2nd Edition | May 2007 | Product Number: G06702R | Price: $69.00

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: $61.00

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

Provides guidance for use in preparing safety and environmental management programs (SEMP) for oil, gas, and sulphur operations and facilities located on the outer continental shelf (OCS). These guidelines are applicable to well drilling, servicing, and production; and pipeline facilities and operations that have the potential for creating a safety or environmental hazard at OCS platform sites. Eleven major program elements are included for application to these facilities and operations. Identification and management of safety and environmental hazards are addressed in design, construction, startup, operation, inspection, and maintenance of new, existing, and modified facilities. Pages: 41

3rd Edition | May 2004 | Reaffirmed: April 2013
Product Number: G07503 | Price: $89.00

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

Chinese translation of RP 75.

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

Bull 75L
Guidance Document for the Development of a Safety and Environmental Management System for Onshore Oil and Natural Gas Production Operations and Associated Activities

Provides general information and guidance for the development of a safety and environmental management system (SEMS) for onshore oil and natural gas operations, including drilling, production, and well servicing activities. Although there is an extensive amount of information that has been developed on the topic of safety and environmental management systems, this document focuses on this industry sector to help foster continuous improvement in our industry's safety and environmental performance. It is recognized that many onshore oil and natural gas companies have effective

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SEMS in place; however, the intent of this document is to provide an additional tool that can assist these and especially other operators in taking the next step toward implementing a complete system at a pace that complements their business plan. For those who already have a mature SEMS in place, this document can be used for continuous improvement of the system. Pages: 12

1st Edition | November 2007 | Product Number: G75L01 | Price: $34.00

RP 76
Contractor Safety Management for Oil and Gas Drilling and Production Operations

Intended to assist operators, contractors, and subcontractors (third parties) in the implementation of a contractor safety program and improve the overall safety performance while preserving the independent contractor relationship. It is intended for the Upstream Segment of the petroleum industry; however, since the operator requirements and the contracted work are diverse, this publication may not be applicable to all operations at each company or to all contract work performed in those operations. Many oil and gas exploration and production companies contract for equipment and personnel services for a wide range of activities, including drilling production, well servicing, equipment repair, maintenance, and construction. Certain activities of contractors have the potential to take place either contractor and/or operator personnel and/or equipment at risk. It is important that operations are carried out in a safe manner. Operators and contractors need to provide safe work places and to protect the safety of their work places and to protect the safety of their workforces and the general public. When they work together to improve safety, both benefit. Pages: 60

2nd Edition | November 2007 | Reaffirmed: January 2013
Product Number: G07602 | Price: $57.00

MULTI-SEGMENT PUBLICATIONS

Human Factors in New Facility Design Tool

Describes a human factors tool that may be used by operating plants as an aid to incorporate human factors principles in the design of equipment that will be operated and maintained by people.

The human factors principles described in this document are intended for new equipment designs; however, many ideas provided in this tool may be used to improve the operating of existing plants where feasible.

This document focuses only on equipment design. Items such as human error, behavior-based safety, and operating procedure issues are not in the scope.

The tool covers equipment that is common to both upstream producing and downstream manufacturing operations. Equipment associated with specific activities such as drilling rigs is not specifically addressed. Pages: 71

2nd Edition | October 2005 | Product Number: I0HF02 | Price: $149.00

Human Factors Tool for Existing Operations

Objectives of this tool include the following:

- provide a tool for operating crews to identify opportunities for latent conditions and human error, and
- improve how process hazards analysis/hazard evaluation/revalidation process address human factors.

The scope of this tool includes existing operations and equipment and human tasks.

This tool is intended for use without specific training on human factors. This is a simple process for gathering a few operators and mechanics who are familiar with the equipment/process and who are qualified to identify where traps (latent conditions) in the equipment and tasks (error likely scenarios) exist that make it easy for people to do something wrong. Pages: 14

1st Edition | February 2006 | Product Number: I0HF03 | Price: $62.00

RP 752
Management of Hazards Associated with Location of Process Plant Permanent Buildings

Provides guidance for managing the risk from explosions, fires and toxic material releases to on-site personnel located in new and existing buildings intended for occupancy. This RP was developed for use at refineries, petrochemical and chemical operations, natural gas liquids extraction plants, natural gas liquefaction plants, and other onshore facilities covered by the OSHA Process Safety Management of Highly Hazardous Chemicals, 29 *CFR* 1910.119.

Buildings covered by this RP are rigid structures intended for permanent use in fixed locations. Tents, fabric enclosures and other soft-sided structures are outside the scope of this document. This 3rd Edition of RP 752:2009 supersedes all previous editions, including the technical data provided in those documents.

Significant research and development of technology pertinent to building siting evaluations has been performed since the publication of the previous editions of RP 752. Examples of updated technology include prediction of blast damage to buildings, determination of occupant vulnerabilities, and estimates of event frequencies. Prior versions of RP 752 and the technical data included in them should not be used for building siting evaluations. The 2nd Edition of RP 752 covered all building types both permanent and portable. This 3rd Edition of RP 752 does not cover portable buildings. Portable buildings are now covered by RP 753. It is recognized, however, that portable buildings specifically designed for significant blast load represent a potential area of overlap between RP 753 and RP 752. In accordance with 1.3 of this document:

> "Buildings described in API RP 753, Management of Hazards Associated with Location of Process Plant Portable Buildings, First Edition, June 2007, as 'portable buildings specifically designed to resist significant blast loads' and intended for permanent use in a fixed location are covered in this document (API RP 752). All other portable buildings are covered by API RP 753." Pages: 27

3rd Edition | December 2009 | Product Number: K75203 | Price: $141.00

RP 753
Management of Hazards Associated with Location of Process Plant Portable Buildings

Provides guidance for reducing the risk to personnel located in portable buildings from potential explosion, fire and toxic release hazards. While occupied permanent buildings (e.g. control rooms, operator shelters) located near covered process area are typically constructed to be blast and fire resistant, conventional portable buildings (i.e. light wood trailers) are typically not constructed to be blast and fire resistant. Past explosion accidents have demonstrated that occupants of conventional portable buildings are susceptible to injuries from structural failures, building collapse, and building debris and projectiles.

Guidance is provided based on the following principles.

- Locate personnel away from covered process areas consistent with safe and effective operations.
- Minimize the use of occupied portable buildings in close proximity to covered process areas.
- Manage the occupancy of portable building especially during periods of increased risk including unit start up or planned shut-down operations.
- Design, construct, install, and maintain occupied portable buildings to protect occupants against potential hazards.
- Manage the use of portable buildings as an integral part of the design, construction, and maintenance operation of a facility. Pages: 22

1st Edition | June 2007 | Reaffirmed: January 2012
Product Number: K75301 | Price: $141.00

RP 754 ■

Process Safety Performance Indicators for the Refining and Petrochemical Industries

(ANSI/API RP 754)

Identifies leading and lagging process safety indicators useful for driving performance improvement. As a framework for measuring activity, status, or performance, this document classifies process safety indicators into four tiers of leading and lagging indicators. Tiers 1 and 2 are suitable for nationwide public reporting, and Tiers 3 and 4 are intended for internal use at individual facilities. Guidance on methods for development and use of performance indicators is also provided. This recommended practice (RP) was developed for the refining and petrochemical industries, but may also be applicable to other industries with operating systems and processes where loss of containment has the potential to cause harm. Applicability is not limited to those facilities covered by the OSHA Process Safety Management Standard, 29 *CFR* 1910.119, or similar national and international regulations. To enable consistent application of this RP to other refining and petrochemical industry sub segments, informative annexes have been created to define the Applicability and Process definition for those subsegments. The user would substitute the content of those annexes for the referenced sections of this RP: Annex A—Petroleum Pipeline and Terminal Operation, Annex B—Retail Service Stations, and Annex C—Oil and Gas Drilling and Production Operations. Performance indicators identified in this recommended practice are based on the following guiding principles.

- Indicators should drive process safety performance improvement and learning.
- Indicators should be relatively easy to implement and easily understood by all stakeholders (e.g. workers and the public).
- Indicators should be statistically valid at one or more of the following levels: industry, company, and facility. Statistical validity requires a consistent definition, a minimum data set size, a normalization factor, and a relatively consistent reporting pool.
- Indicators should be appropriate for industry, company, or facility level benchmarking. Pages: 118

2nd Edition | April 2016 | Product Number: K75402 | Price: $150.00

RP 755

Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries

(ANSI/API RP 755)

As a result of the U.S. Chemical Safety and Hazard Investigation Board (CSB) investigation of the 2005 BP Texas City incident, the CSB issued several recommendations including the development of an American National Standards Institute standard that develops fatigue prevention guidelines for the refining and petrochemical industries that, at a minimum, limit hours and days of work and address shift work.

Provides guidance to all stakeholders (e.g. employees, managers, supervisors) on understanding, recognizing, and managing fatigue in the workplace. Owners and operators should establish policies and procedures to meet the purpose of this document

Developed for refineries, petrochemical and chemical operations, natural gas liquefaction plants, and other facilities such as those covered by the OSHA Process Safety Management Standard, 29 *CFR* 1910.119. This document is intended to apply to a workforce that is commuting daily to a job location.

Applies to all employees working night shifts, rotating shifts, extended hours/days, or call outs involved in process safety sensitive actions. It should also be considered for others making process safety-sensitive decisions. On-site contractors involved in process safety sensitive actions shall have fatigue risk management systems equivalent to the criteria outlined in this document. Pages: 11

1st Edition | April 2010 | Product Number: K75501 | Price: $83.00

TR 755-1

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: $103.00

RP 756

Management of Hazards Associated with Location of Process Plant Tents

Provides guidance for managing the risk from explosions, fires and toxic material releases to on-site personnel located in tents. The term "tent" is used to describe a wide range of structures and is defined in §3.15. This RP was developed for use at refineries, petrochemical and chemical operations, natural gas liquids extraction plants, natural gas liquefaction plants, and other onshore facilities covered by OSHA 29 *CFR* 1910.119. The focus of this RP is primarily on process related hazards. However, non-process related hazards may exist that could present risks to tent occupants. Previous accidents have demonstrated that tent occupants are susceptible to injuries from fires originating inside the tent, from tent collapse due to extreme weather, and from falling objects. Some of these hazards are addressed by tent design standards, manufacturer's recommendations, and local regulations. Pages: 25

1st Edition | September 2014 | Product Number: C75601 | Price: $125.00

TR 756-1

Process Plant Tent Responses to Vapor Cloud Explosions—Results of the American Petroleum Institute Tent Testing Program

Beginning in 2011, the American Petroleum Institute (API) 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: $190.00

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: $76.00

Std 780
Security Risk Assessment Methodology for the Petroleum and Petrochemical Industries

Prepared by a Security Risk Assessment (SRA) Committee of the American Petroleum Institute (API) to assist the petroleum and petrochemical industries in understanding security risk assessment and in conducting SRAs. The standard describes the recommended approach for assessing security risk widely applicable to the types of facilities operated by the industry and the security issues the industry faces. The standard is intended for those responsible for conducting security risk assessments and managing security at these facilities. The method described in this standard is widely applicable to a full spectrum of security issues from theft to insider sabotage to terrorism. The API SRA Methodology was developed for the petroleum and petrochemical industry, for a broad variety of both fixed and mobile applications. This recommended practice describes a single methodology, rather than a general framework for SRAs, but the methodology is flexible and adaptable to the needs of the user. This methodology constitutes one approach for assessing security vulnerabilities at petroleum and petrochemical industry facilities. However, there are other risk assessment techniques and methods available to industry, all of which share common risk assessment elements. Pages: 113

1st Edition | May 2013 | Product Number: K78001 | Price: $190.00

RP 2001
Fire Protection in Refineries

Covers basic concepts of refinery fire protection. It reviews the chemistry and physics of refinery fires; discusses how the design of refinery systems and infrastructure impact the probability and consequences of potential fires; describes fire control and extinguishing systems typically used in refineries; examines fire protection concepts that should be covered in operating and maintenance practices and procedures; and provides information on organization and training for refinery emergency responders. Many of the concepts, systems and equipment discussed in this document are covered in detail in referenced publications, standard or governmental requirements. Pages: 75

9th Edition | April 2012 | Product Number: C200109 | Price: $115.00

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 | Product Number: K20038 | Price: $190.00

RP 2009
Safe Welding, Cutting, and Hot Work Practices in the Petroleum and Petrochemical Industries

Provides guidelines for safely conducting welding, cutting or other hot work activities in refineries, gas plants, petrochemical plants, and other facilities in the petroleum and petrochemical industries. It provides specific guidance for evaluating procedures for certain types of work on equipment in service. It does not include guidance for compliance with regulations or codes; hot tapping; welding techniques, normal, "safe work" practices; or entry or work in inert environments. Pages: 23

7th Edition | February 2002 | Reaffirmed: March 2012
Product Number: K20097 | Price: $79.00

RP 2027
Ignition Hazards Involved in Abrasive Blasting of Atmospheric Storage Tanks in Hydrocarbon Service

Identifies the ignition hazards involved in abrasive blasting of the exteriors of hydrocarbon storage tanks containing a mixture that is flammable or that can become flammable when air is added. It provides operational guidelines for procedures that significantly reduce ignition risks during abrasive blasting of hydrocarbon tanks that may contain a flammable vapor space. Pages: 4

3rd Edition | March 2002 | Reaffirmed: March 2012
Product Number: C20273 | Price: $74.00

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: $59.00

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: $105.00

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: October 2010
2-Year Extension: February 2015 | Product Number: K22015 | Price: $86.00

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 2015
Product Number: K22103 | Price: $65.00

RP 2216
Ignition Risk of Hydrocarbon Vapors by Hot Surfaces in the Open Air

Provides information concerning the potential for ignition of hydrocarbons that are exposed to hot surfaces in the open air. Hydrocarbon liquids, when heated sufficiently, can ignite without the application of a flame or spark. The ignition of hydrocarbons by hot surfaces may occur when oil is released under pressure and sprays upon a hot surface or is spilled and lies upon a hot surface for a period of time. Understanding the mechanism and dynamics of auto-ignition is an important step in preventing or controlling the ignition of hydrocarbons by hot surfaces in the open air. In addition to the information provided herein, appropriate industry standards and other information may assist users to understand the potential hazards of hydrocarbon auto-ignition (such as spontaneous combustion) not specifically covered by this publication and implement appropriate prevention and control measures. Pages: 5

3rd Edition | December 2003 | Reaffirmed: October 2015
Product Number: K22163 | Price: $59.00

Std 2217A
Guidelines for Safe Work in Inert Confined Spaces in the Petroleum and Petrochemical Industries

Provides guidelines for safely entering and working in and near confined spaces that have inert atmospheres and can aid employers in preparing specific procedures for working safely in inert confined spaces, recognizing that because of its unique nature, the hazards and requirements for inert entry are generally greater than for "normal" permit-required confined space (PRCS) entry. Std 2217A applies to confined spaces that have been intentionally purged with an inert gas until:

- the oxygen level in the vapor space is too low to support combustion, and
- any gases in or flowing out of the confined space are below flammable or reactive levels.

Typical inert entry work in the petroleum and petrochemical industry includes work to service or replace catalyst in reactors. Pages: 25

4th Edition | July 2009 | 2-Year Extension: February 2015
Product Number: K2217A4 | Price: $88.00

RP 2218
Fireproofing Practices in Petroleum and Petrochemical Processing Plants

Intended to provide guidance for selecting, applying, and maintaining fireproofing systems designed to limit the extent of fire-related property loss from pool fires in the petroleum and petrochemical industries. Where comparable hazards exist, and to the extent appropriate, it may be applied to other facilities that could experience similar severe fire exposure and potential losses.

This RP identifies fireproofing needs for petroleum and petrochemical plants specifically focusing on property loss protection for pool fires scenarios in on-shore processing plants. Pages: 60

3rd Edition | July 2013 | Product Number: K22183 | Price: $160.00

RP 2219 ■
Safe Operation of Vacuum Trucks Handling Flammable and Combustible Liquids in Petroleum Service

Provides information concerning the safe operation of vacuum trucks engaged in all aspects of handling flammable and combustible liquids, associated waste water, produced water, sour water, basic sediment and water (BS&W), caustics, spent acids, or other fluids stemming from petroleum operations, products, powders, and the hazard of dust explosions. This publication discusses the types of vacuum pumps and cargo tanks associated with vacuum truck operations, the common hazards associated with those vacuum truck operations, and representative safe work practices and precautions to help prevent accidents and injuries. Appendix G provides brief descriptions of a variety of incidents involving vacuum trucks, including offloading into open areas. These may be useful in reviewing specific operating procedures or developing materials for safety meetings or pre-job briefings. Pages: 60

4th Edition | June 2016 | Product Number: K22194 | Price: $165.00

Std 2220
Contractor Safety Performance Process

Assists owners and contractors in developing, improving, and maintaining their mutual safety programs. Widely diverse contractor functions and uses may include resident, non-resident, long-term, and short-term contractors. These have in common the need for effective safety programs to protect both owner and contractor personnel from workplace injury and illness, as well as from losses associated with incidents arising out of contractor work. This standard aims to help both owners and contractors improve the contractor's safety performance while preserving the independent contractor relationship. It was developed for the petroleum and petrochemical industries and the firms that perform contract work for them.

Contractors perform greatly varied work within the petroleum and petrochemical industries. Some perform construction and turnaround activities or drilling and well servicing; specialty contractors provide skills and services that are not typically found within an owner's work force. Contractors may even provide services that augment the peak loads and skills of owners' work forces, such as in the maintenance and operation of facilities. Since owner sites and contracted work are diverse, this standard may not be applicable to all operations at each company or to all contract work performed in those operations. As such, this publication may not apply to incidental contractors that generally do not affect facility safety, such as those that provide janitorial, laundry, and delivery services.

This document addresses "conventional" safety and health. It does not address safety concerns associated with security or terrorism issues. Pages: 26

3rd Edition | October 2011 | Product Number: K222003 | Price: $91.00

Std 2220 *
Contractor Safety Performance Process—Chinese

Chinese translation of Std 2220.

3rd Edition | October 2011 | Product Number: K222003C | Price: $64.00

RP 2221
Contractor and Owner Safety Program Implementation

Many facilities in the refining and petrochemical processing industries employ contractor personnel for a wide range of activities, from administrative support to equipment repair, maintenance, and construction. Contractor activities that involve work in or around process equipment can have an increased potential to place both contractor personnel and owner personnel at risk.

This guide is intended to assist refining and petrochemical industry facility owners and contractors to implement (or improve) an effective contractor health and safety program. In the petroleum segment, RP 2221 applies to downstream activities only. This includes refineries, pipelines, and marketing and distribution terminals, but not exploration and production or marine. This document provides guidance for applying the principles outlined in RP 2220. Security issues maintain a high profile in all aspects of industry, including the contractor screening and selection process; however, security is outside the scope of this standard and is mentioned as a reminder of the need for many facilities to include security in their contractor processes. This publication intends to preserve the independent contractor relationship while helping both owners and contractors improve contractor safety performance. It is based on experience in the petroleum and petrochemical industries and experience of firms that perform contract work for these industries. Since owner facilities, equipment, sites, and contracted work are diverse, this publication may not be applicable to operations at all facilities or to all contract work performed in these operations. This publication may not apply

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to contractors working in low risk environments that generally do not affect facility safety, such as those that provide incidental or supplementary services such as janitorial, beverage, or laundry.

The purpose of this publication is to assist owners and contractors to improve their safety programs. Joint commitment and support of safety program initiatives are essential in minimizing incidents and preventing injuries and illnesses. The nature of the work performed by contractors within the petroleum and chemical industries varies greatly. Some contractors perform construction and turnaround activities; other specialty contractors provide skills and services that are not typically found within an owner's work force. Other contractors may provide services to augment the peak loads and skills of owners' work forces, such as in maintenance and operation of facilities. These diverse functions and uses of contractors share a common need for effective safety programs to protect owner and contractor personnel from workplace injuries, illnesses, and losses associated with incidents arising out of contractor work. Pages: 87

3rd Edition | August 2011 | Product Number: K222103 | Price: $167.00

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: $96.00

Publ 2376

1997 Summary of U.S. Occupational Injuries, Illness, and Fatalities in the Petroleum Industry

June 1998 | Product Number: K23761 | Price: $96.00

Publ 2377

1998 Summary of U.S. Occupational Injuries, Illness, and Fatalities in the Petroleum Industry

March 1999 | Product Number: K23771 | Price: $103.00

Publ 2378

1999 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

June 2000 | Product Number: K23781 | Price: $103.00

Publ 2379

2000 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2001 | Product Number: K23790 | Price: $103.00

Publ 2380

2001 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2002 | Product Number: K23801 | Price: $103.00

Publ 2381

2002 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

June 2003 | Product Number: K23811 | Price: $103.00

Publ 2382

2003 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

May 2004 | Product Number: K23821 | Price: $103.00

Publ 2383

2004 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2005 | Product Number: K23831 | Price: $103.00

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: $103.00

Publ 2385

2006 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

June 2007 | Product Number: K23851 | Price: $103.00

Publ 2386

2007 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

May 2008 | Product Number: K23861 | Price: $103.00

Publ 2387

2008 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only

March 2009 | Product Number: K23871 | Price: $103.00

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: $103.00

1989 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

January 1989 | Product Number: K19996 | Price: $59.00

1990 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

July 1991 | Product Number: K19988 | Price: $83.00

1991 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

September 1992 | Product Number: K19987 | Price: $83.00

1992 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

August 1993 | Product Number: K19986 | Price: $83.00

1993 Summary of Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

June 1994 | Product Number: K19985 | Price: $96.00

1994 Summary of U.S. Occupational Injuries, Illnesses and Fatalities in the Petroleum Industry

June 1995 | Product Number: K19984 | Price: $96.00

1995 Summary of U.S. Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

May 1996 | Product Number: K19983 | Price: $96.00

Publ 2510A

Fire Protection Considerations for the Design and Operation of Liquefied Petroleum Gas (LPG) Storage Facilities

Supplements Std 2510 and addresses the design, operation, and maintenance of liquefied petroleum gas (LPG) storage facilities from the standpoint of prevention and control of releases, fire protection design, and fire control measures. The history of LPG storage facility safety experience, facility design philosophy, operating and maintenance procedures, and various fire protection and fire-fighting approaches are presented. The storage facilities covered are LPG installations (storage vessels and associated loading/unloading/transfer systems) at marine and pipeline terminals, natural gas processing plants, refineries, petrochemical plants, and tank farms. Pages: 45

2nd Edition | December 1996 | Reaffirmed: December 2015
Product Number: K2510A | Price: $101.00

STORAGE TANK SAFETY STANDARDS

Std 2015 ◆

Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks

Applies to stationary atmospheric and low-pressure (up to and including 15 psig) aboveground petroleum storage tanks used in all sectors of the petroleum and petrochemical industry, including:

- crude oil and gas production,
- refining; petrochemicals,
- pipelines and terminals,
- bulk storage, and
- ethanol facilities.

This standard provides requirements for safely planning, coordinating, and conducting tank entry and cleaning operations, from removal from service through return to service. This standard does not and cannot cover every possible unique hazard or situation that may arise during tank cleaning operations. Site, product and tank-specific hazards and situations must be addressed by employers using the appropriate principles and considerations provided for by this standard. Pages: 60

7th Edition | May 2014 | Product Number: K20157 | Price: $150.00

RP 2016 ◆

Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks
(ANSI/API RP 2016)

Supplements the requirements of Std 2015, Seventh Edition. This recommended practice (RP) provides guidance and information on the specific aspects of tank cleaning in order to assist employers (owners/operators and contractors) to conduct safe tank cleaning operations in accordance with the requirements of Std 2015. Pages: 98

1st Edition | August 2001 | Reaffirmed: May 2006
Product Number: K20161 | Price: $192.00

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: June 2006
Product Number: K20214 | Price: $134.00

RP 2023

Guide for Safe Storage and Handling of Heated Petroleum Derived Asphalt Products and Crude Oil Residua

Describes phenomena that can occur and precautions to be taken in the storage and handling of asphalt products and residua derived from crude petroleum. It applies when these materials are stored in heated tanks at refineries and bulk storage facilities and transported in tank vehicles. Pages: 44

3rd Edition | August 2001 | Reaffirmed: June 2006
Product Number: K20233 | Price: $110.00

Publ 2026 ◆

Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service

Provides safety information for individuals responsible for performing maintenance or repairs that involve descent onto the floating roofs of petroleum storage tanks. Pages: 15

2nd Edition | April 1998 | Reaffirmed: June 2006
Product Number: K20262 | Price: $62.00

RP 2207 ◆

Preparing Tank Bottoms for Hot Work

Addresses only the safety aspects of hot work on petroleum storage tank bottoms. It discusses safety precautions for preventing fires, explosions, and associated injuries. The term “hot work,” as used in this publication, is defined as an operation that can produce a spark or flame hot enough to ignite flammable vapors. Pages: 32

6th Edition | December 2007 | Reaffirmed: March 2012
Product Number: K22076 | Price: $86.00

Std 2350

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

Applies to storage tanks associated with marketing, refining, pipeline, and terminals operations and with tanks containing Class I or Class II petroleum liquids and use is recommended for Class III petroleum liquids. This standard addresses overfill protection for petroleum storage tanks. It recognizes that 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 that comply with PEI 600; pressure vessels; tanks containing non-petroleum liquids; tanks storing LPG and LNG; tanks at service stations; tanks filled exclusively from wheeled vehicles (i.e. tank trucks or railroad tank cars); and tanks covered by OSHA 29 *CFR* 1910.119 and EPA 40 *CFR* 68, or similar regulations. Pages: 47

4th Edition | May 2012 | Product Number: K235004 | Price: $114.00

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

Air Research

EMISSIONS: GENERAL

Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Gas Industry
API Tools for Estimating GHG Emissions

Accurate estimation of greenhouse gas emissions is indispensable to responsibly addressing climate change. Through API, the U.S. oil and natural gas industry has provided a suite of tools for estimating emissions. It includes API's updated 2009 compendium of emissions estimation methodologies, software for emissions estimation and inventorying, and guidelines (created by the International Petroleum Industry Environmental Conservation Association) to assist in the accounting and reporting of emissions. Pages: 807

August 2009 | Available for download at www.api.org/ehs/climate/new/upload/2009_GHG_COMPENDIUM.pdf

DR 76
Determination of Emissions from Retail Gasoline Outlets Using Optical Remote Sensing: Pilot Field Study at a Non-Vapor Recovery Site, Project Summary Report, Volume I

Results of this study are presented in a three-volume report. Volume I presents the results of a pilot study to evaluate the use of optical remote sensing (ORS) technology for determining emission factors as well as the dispersion of the emissions at an uncontrolled retail gasoline outlet (RGO). ORS techniques may be able to provide a direct method of determining the total emissions from an RGO under varied conditions and to provide this information with little interference with the operation of RGO. Pages: 50

November 1999 | Product Number: I00076 | Price: $122.00

DR 141
Global Emissions of Carbon Dioxide from Petroleum Sources

Describes carbon dioxide emission estimates developed for a broadly defined petroleum industry whose five segments include (1) exploration and extraction; (2) crude petroleum transportation to refineries; (3) refining operations; (4) refinery products transportation; and (5) end uses. Emission estimates for carbon dioxide have been developed for each industry segment and for each country. Activity factors describe the activity level for a particular industrial activity. Corresponding emission factors for each activity factor were developed from U.S. Environmental Protection Agency and industry documents. Pages: 91

July 1991 | Product Number: I00141 | Price: $59.00

Publ 326
The Cost Effectiveness of VOC and 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: $148.00

Publ 332
Comparison of Screening Values from Selected Hydrocarbon Screening Instruments

Describes a study carried out at two refineries to compare differences in equipment leak screening values obtained from four instruments commonly used to measure fugitive emissions. The effect of screening distance was also evaluated, and the results from the study were compared to those of an earlier study conducted in 1979. Adjustment factors to relate screening values from one instrument are presented, which are applicable to marketing, transportation, and exploration and production facilities as well as refineries. Pages: 128

August 1995 | Product Number: J33200 | Price: $90.00

Publ 342 and Publ 343
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: $63.00
Product Number for Publ 343: J34300 | Price: $63.00

Publ 344
Critical Review of Source Sampling and Analysis Methodologies for Characterizing Organic Aerosol and Fine Particulate Source Emission Profiles

Intended for use in designing future measurement programs for characterizing emissions from stationary sources that contribute to fine particle concentrations in the atmosphere. The benefits and drawbacks of various measurement approaches are discussed, and a recommended approach for combustion sources is presented. Pages: 128

June 1998 | Product Number: J34400 | Price: $74.00

Publ 347
Hazardous Air Pollutant Emissions from Gasoline Loading Operations at Bulk Gasoline Terminals

Hazardous air pollutant (HAP) emission testing was conducted at 33 bulk gasoline terminals across the United States. Emissions were measured from the loading of gasoline cargo tanks at facilities with a vapor control system. Emission tests from 23 carbon adsorption units, 8 thermal oxidizers, and 2 refrigeration units were included. Control efficiencies for eight HAP compounds were derived for the carbon adsorption units and thermal oxidizers; no control efficiencies were reported from the refrigeration units due to the limited data collected. The HAP control efficiencies presented in this report have been used to develop HAP emission factors that can be used to determine HAP emissions based on the volume of gasoline loaded at a facility. Pages: 138

October 1998 | Product Number: J34700 | Price: $83.00

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: $100.00

Publ 4653
Fugitive Emission Factors for Crude Oil and Product Pipeline Facilities

Presents the results of a study to determine equipment component fugitive emission factors for crude oil and product pipeline facilities. The emission factors presented in this report will allow pipeline operators to estimate total hydrocarbon emissions from equipment components located at pipeline facilities in light crude service, heavy crude service, and product service. Pages: 50

June 1997 | Product Number: I46530 | Price: $79.00

Publ 4667
Vehicle Emissions Testing of Rapidly Aged Catalysts

A test program was conducted to measure the effect of changing fuel sulfur content on the exhaust emissions of a 1993 Honda Civic VX certified to meet California Transitional Low Emission Vehicle (TLEV) standards. The results showed that: (a) on average, lowering fuel sulfur content from 600 to 35 ppm reduced exhaust emissions measured over the Federal Test Procedure (FTP) by 21 % to 27 % depending on the pollutant; (b) fuel sulfur content did not have an effect on the long-term emissions performance of catalysts that have been artificially aged; (c) rapid catalyst aging did not have a large effect on sulfur response compared to in-use aging; (d) gasoline sulfur content did not have a significant effect on catalyst oxygen storage capacity for this catalyst type; and (e) the emissions response to lower sulfur obtained from measurements on a Honda Civic VX, TLEV-operated under transient conditions according to the FTP, was less than one-half of that observed in a previous study using an identical Honda catalyst in a laboratory setting. Pages: 52

November 1997 | Product Number: I46670 | Price: $61.00

Publ 4703
Gas Fired Boiler—Test Report Site A: Characterization of Fine Particulate Emission Factors and Speciation Profiles from Stationary Petroleum Industry Combustion Sources

In 1997, the U.S. Environmental Protection Agency (EPA) promulgated new ambient air standards for particulate matter (PM) smaller than 2.5 micrometers in diameter (PM 2.5). Source emissions data are needed to assess the contribution of petroleum industry combustion sources to ambient PM 2.5 concentrations. This report presents particulate measurement results from a 550,000 pounds per hour steam boiler firing refinery process gas. The particulate stack measurements were made using both a dilution tunnel research test method and traditional EPA sampling methods. Pages: 119

July 2001 | Product Number: I47030 | Price: $88.00

Publ 4704
Gas Fired Heater—Test Report Site B: Characterization of Fine Particulate Emission Factors and Speciation Profiles from Stationary Petroleum Industry Combustion Sources

In 1997, the U.S. Environmental Protection Agency (EPA) promulgated new ambient air standards for particulate matter (PM) smaller than 2.5 micrometers in diameter (PM 2.5). Source emissions data are needed to assess the contribution of petroleum industry combustion sources to ambient PM 2.5 concentrations. This report presents particulate measurement results from a 114 million British thermal unit (MMBtu) per hour gas-fired refinery process heater. The particulate stack measurements were made using both a dilution tunnel research test method and traditional EPA sampling methods. Pages: 118

August 2001 | Product Number: I47040 | Price: $88.00

Publ 4712
Gas-Fired Steam Generator—Test Report Site C: Characterization of Fine Particulate Emission Factors and Speciation Profiles from Stationary Petroleum Industry Combustion Sources

In 1997, the U.S. Environmental Protection Agency promulgated new ambient air standards for particulate matter (PM) smaller than 2.5 micrometers in diameter (PM 2.5). Source emissions data are needed to assess the contribution of petroleum industry combustion sources to ambient PM 2.5 concentrations. This report presents that the gas fired steam generator has a maximum heat input of 62.5 MMBtu/Hr with an average rate of approximately 50 MMBtu/hr. Pages: 100

July 2001 | Product Number: I47120 | Price: $83.00

Publ 4720
Comparison of API and EPA Toxic Air Pollutant Emission Factors for Combustion Sources

Compares and explains differences in published toxic air pollutant emission factors for combustion sources and recommends priorities for gathering additional emission factor information. Pages: 50

September 2002 | Product Number: I47200 | Price: $92.00

Publ 4772
Measuring Particulate Emissions from Combustion Sources

Since the inception of the Clean Air Act, the petroleum refining industry has been faced with the need to determine criteria pollutant emissions from combustion sources. While some of these species, such as 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

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

conditions leading to the formation of condensable particulate matter from stack gas components along with the methods used to measure PM emissions from refinery combustion sources. Pages: 27

September 2008 | Product Number: I47720 | Price: $62.00

Publ 4775

Simulating the Effect of Aerobic Biodegradation on Soil Vapor Intrusion into Buildings—Evaluation of Low Strength Sources Associated with Dissolved Gasoline Plumes

Aerobic biodegradation can contribute significantly to the attenuation of petroleum hydrocarbon vapors in the unsaturated zone; however, most regulatory guidance for assessing potential human health risks via vapor intrusion to indoor air either neglect biodegradation or only allow for one order of magnitude additional attenuation for aerobically degradable compounds, which may be overly conservative in many cases. This paper describes results from three-dimensional numerical model simulations of vapor intrusion for petroleum hydrocarbons to assess the influence of aerobic biodegradation on the attenuation factor for a variety of source concentrations and depths for buildings with basements and slab-on-grade construction. Provided that oxygen is present in the vadose zone, aerobic biodegradation of petroleum hydrocarbon vapors in the unsaturated zone will reduce the soil gas concentrations and the potential risks from vapor intrusion to indoor air compared to nondegrading compounds. At lower source concentrations and/or deeper source depths, aerobic biodegradation may result in a reduction in vapor intrusion attenuation factors by many orders of magnitude. The magnitude of the reduction depends on site-specific conditions, which should be considered in the development of a conceptual site model for each site. However, oxygen supply and degradation rates are likely to be sufficient at many sites to mitigate potential risks from vapor intrusion for low vapor concentration sources (less than about 2 mg/L-vapor total hydrocarbons). The simulations conducted in this study provide a framework for understanding the degree to which 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: $108.00

Publ 4776

A Guide to Understanding, Assessment and the Regulation of PAHs in the Aquatic Environment

Designed to be an introductory guide to understanding and assessing polycyclic aromatic hydrocarbons (PAHs) in the aquatic environment (water and sediments). API prepared this guide primarily for refinery personnel and home office environmental staff who may have to address PAH issues. In addition, this guide may also be useful to staff in regulatory agencies that work with PAHs in wastewater discharge permits, waste load allocations (total maximum daily loadings), and sediment investigation and remediation.

The guide provides an overview on the chemistry, fate, and sources of PAHs in the environment and the regulatory implications. The guide also includes descriptions of the different sources of PAHs (petrogenic, pyrogenic, diagenic, biogenic) and techniques for differentiating these sources through their characteristic fingerprints, including straightforward ways to help identify or rule out potential sources. Pages: 60

September 2011 | Product Number: I47760 | Price: $107.00

EMISSIONS: EXPLORATION AND PRODUCTION

Publ 4589

Fugitive Hydrocarbon Emissions from Oil and Gas Production Operations

The emission factors derived in this report indicate that fugitive emissions from production facilities are considerably lower than they were in the late 1970s. Investigators use portable detectors to screen more than 180,000 components at 20 offshore and onshore facilities. Mass emission rates from "bagged" emitters, valves, connectors, and other components, such as seals and vents, are used to develop emission factors for individual components and groups of components. A workbook included in the report provides site operators with three different options to calculate emissions from their facilities. See also Publ 4615. Pages: 263

December 1993 | Product Number: I45890 | Price: $142.00

Publ 4615

Emission Factors for Oil and Gas Production Operation

Supplements the information found in Publ 4589 and contains revised emission factors developed from 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: $61.00

Publ 4638

Calculation Workbook for Oil and Gas Production Equipment Fugitive Emissions

This workbook, which is the result of five years of field testing of equipment components at production facilities across the United States, is a valuable tool for petroleum producers who are interested in estimating fugitive emissions from their oil and gas production sites. Four methods of calculating fugitive emissions are presented: EPA average emission factor method, EPA screening value range emission method, EPA correlation method, and leak quantification method. Pages: 62

July 1996 | Product Number: I46380 | Price: $61.00

Publ 4644

A Methodology for Estimating Incremental Benzene Exposures and Risks Associated with Glycol Dehydrators

The U.S. Environmental Protection Agency and API collaborated to develop a methodology to estimate benzene exposures and associated risks under representative emission conditions applicable to glycol dehydrators. The result (spreadsheet program and Monte Carlo routine) was a PC-based model called SIMRISK. A simplified version was developed that could be incorporated into control applicability criteria for glycol dehydrator vent emissions. Pages: 84

February 1997 | Product Number: I46440 | Price: $79.00

Publ 4661

Exploration and Production Emission Calculator II (EPEC II) User's Guide

The Exploration and Production Emission Calculator Version 2.0 (EPEC II) is a software tool that can be used to estimate emissions for exploration and production facilities. EPEC II integrates user inputs, emission calculations, and data summaries for many equipment types common to exploration and production facilities. The calculation techniques and emission factors utilized by the EPEC II software were, in most cases, established by the U.S. Environmental Protection Agency, API, and the Gas Research Institute. Published references that provide background information for the calculation methods used in EPEC II are given for each equipment type in both the software and in each section of this user's guide. Pages: 96

2nd Edition | January 2007 | Product Number: I46610 | Price: $125.00

Publ 4662
Evaluation of a Petroleum Production Tank Emissions Model

E&P TANK was evaluated for petroleum production tanks in an emission measurement project sponsored by API and the Gas Research Institute. Emission testing was performed on storage tank vents located at seven sites in widely diverse oil and gas producing regions across the United States. Measured emissions were found to be in agreement with E&P TANK model predictions. Pages: 338

October 1997 | Product Number: I46620 | Price: $117.00

Publ 4679
Amine Unit Air Emissions Model and User's Guide, AMINECalc Version 1.0

AMINECalc is a user-friendly Windows®-based software program that estimates hydrocarbon emissions from amine-based sour gas and natural gas liquid sweetening units. The output generated by the software can be used for regulatory reporting by unit operators according to the requirements of the Clean Air Act Amendments of 1990. AMINECalc performs three types of calculation options: (1) mass balance calculation, (2) gas process (gas feed) simulation, and (3) NGL process (liquid feed) simulation. Mass emission rates of hazardous air pollutants, including benzene, toluene, ethylbenzene, and xylenes (BTEX), and volatile organic compounds can be estimated with the use of AMINECalc. System requirements for running AMINECalc Version 1.0 are IBM PC 486 compatible or higher, 8 MB RAM or more, and Windows® 95/98/NT. Approximately 2 MB of hard disk space are required to hold the program and its supporting run-time libraries. For better interface viewing, it is recommended that the user set the monitor to a high color 16 bit (or higher) resolution. See also Publ 4680. Pages: 76

January 1999 | Product Number: I46790 | Price: $494.00

Publ 4680
Amine Unit Air Emissions Model Evaluation

The implementation of the 1990 Clean Air Act Amendments in the United States has created the need for a reliable method to estimate and report hydrocarbon emissions from amine units. A simulation package, called Amine Unit Air Emission Model (AMINECalc) Version 1.0 was developed. This report evaluates the AMINECalc model by comparing the simulation results with field data collected from operating gas plants. It also recommends improvements and modifications to refine the predictions. See also Publ 4679. Pages: 96

December 1998 | Product Number: I46800 | Price: $120.00

Publ 4683
Correlation Equations to Predict Reid Vapor Pressure and Properties of Gaseous Emissions for Exploration and Production Facilities

Establishes simple techniques for exploration and production (E&P) operators of petroleum storage tank facilities to use for the preparation of site-specific emission inventories to meet environmental regulations. Analyses were performed of oil and gas sampling results and emissions modeling results for more than 100 crude oil E&P storage tanks. Correlation equations or statistical averages were recommended to estimate Reid Vapor Pressure, vented flash gas molecular weight, vented working and standing gas molecular weight, hydrocarbon speciation (including hazardous air pollutants), and separator gas specific gravity. Pages: 82

December 1998 | Product Number: I46830 | Price: $79.00

Publ 4697
Production Tank Emissions Model (E&P TANK, Version 3.0)

E&P TANKS (API Publ 4697) is a computer-based software designed to use site-specific information to predict emission from petroleum production storage tanks, now compatible with 32-bit and 64-bit Windows 7 as well as Windows 2000/XP/Vista. It estimates flashing, working, and standing losses and calculates losses using specific operations for each user's tank. Cited by the Environmental Protection Agency (EPA), it allows the user to enter specific tank condition information to generate air emission reports. Visit www.eptanks.com for pricing and information.

EMISSIONS: MARKETING

Publ 4588
Development of Fugitive Emission Factors and Emission Profiles for Petroleum Marketing Terminals, Volume 1

To evaluate the accuracy of fugitive emission estimates for petroleum marketing terminals, a study was designed to determine average emission factors and fugitive emission correlation equations for components in light liquid and gas vapor services. Four marketing terminals were tested, and the results of the study are presented in this report. See also appendices to this document, Publ 45881. Pages: 146

May 1993 | Product Number: I45880 | Price: $123.00

Publ 45881
Development of Fugitive Emission Factors and Emission Profiles for Petroleum Marketing Terminals, Volume 2

This volume is the appendix to Publ 4588. Appendices include statistical analyses of data, field inventory sheet data, emitter data, nonaromatic speciation data, and aromatic speciation data. See also Publ 4588. Pages: 217

May 1993 | Product Number: I45881 | Price: $115.00

EMISSIONS: REFINING

Validation of Heavy Gas Dispersion Models with Experimental Results of the Thorney Island Trials
Volumes I & II
June 1986

Publ 310
Analysis of Refinery Screening Data

Analyzes five and a half years of screening data from seven Los Angeles California refineries, comprising 11.5 million values. Information was obtained to help determine (1) the design and operational characteristics that influence emissions and (2) whether a focused leak detection and repair program could be more cost-effective while reducing emissions than the current method of monitoring all system components. Pages: 64

November 1997 | Product Number: J31000 | Price: $57.00

Publ 337
Development of Emission Factors for Leaks in Refinery Components in Heavy Liquid Service

Estimating air pollutants from stationary sources is necessary for compiling emission inventories, determining emission fees, and meeting the conditions of various permits and compliances. This report provides revised emission factors applicable to refinery components in heavy liquid service, which were based on extensive field measurements. It also provides data analyses to determine whether the type of distillate or residual hydrocarbon in the stream would influence the emission factors. Pages: 68

August 1996 | Product Number: J33700 | Price: $74.00

Publ 4587
Remote Sensing Feasibility Study of Refinery Fenceline Emissions

Reviews the state of the art of optical remote sensing (ORS) technology and examines the potential use of ORS systems combined with ancillary measurements, such as meteorological and tracer gas release data to determine fugitive emission rates. The report also highlights some issues to consider in planning an ORS field study and clarifies the attendant tradeoffs for issues such as selection of appropriate ORS systems, consideration of detection limits and beam placement, choice of dispersion models, use of tracer gas releases, time scale and timing of field studies, and the requisite meteorological measurements. Pages: 105

April 1994 | Product Number: I45870 | Price: $70.00

Publ 4612
1993 Study of Refinery Fugitive Emissions from Equipment Leaks, Volumes I and II

Describes a study to document how fugitive emissions from equipment leaks have changed since the 1980s. Fugitive emissions from valves, pumps, connectors, and open-ended lines of five refineries were measured to develop new emission correlation equations and emission factors. Volume I contains the summaries and results of data analysis. Volume II contains descriptions of the testing approach, special studies to enhance data analysis, and documentation of quality control results. See also companion document Publ 4613. Pages: 248

April 1994 | Product Number: I46120 | Price: $142.00

Publ 4613
1993 Study of Refinery Fugitive Emissions from Equipment Leaks, Volume III

This volume is the appendix to Publ 4612. It contains raw data, in-depth discussions of calculations and statistics, and more complete, independent audit results. See also companion document Publ 4612. Pages: 307

April 1994 | Product Number: I46130 | Price: $97.00

Publ 4639
Estimation of Fugitive Emissions from Petroleum Refinery Process Drains

Presents a protocol to facilitate the measurement and modeling of volatile organic compound (VOC) emissions from refinery process drains. It includes a comprehensive literature review on fugitive emissions from refinery process drains, the results of a survey of process drains at three refineries, a review of models that describe VOC emissions from drain structures, and the results from a series of tests carried out to evaluate the suitability of the equipment and procedures that make up the protocol. Pages: 200

March 1996 | Product Number: I46390 | Price: $87.00

Publ 4677
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: $97.00

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: $97.00

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: $412.00

Publ 4713
Test Report: Fluidized Catalytic Cracking Unit at a Refinery (Site A), Characterization of Fine Particulate Emission Factors and Speciation Profiles from Stationary Petroleum Industry Combustion Sources

There are few existing data on emissions and characteristics of fine aerosols from petroleum industry combustion sources, and the limited information that is available is incomplete and outdated. API developed a test protocol to address this data gap, specifically to:

- develop emission factors and speciation profiles for emissions of primary fine particulate matter (i.e. particulate present in the stack flue gas including condensable aerosols), especially organic aerosols from gas-fired combustion devices, and
- identify and characterize secondary particulate (i.e. particulate formed via reaction of stack emissions in the atmosphere) precursor emissions.

This report presents the results of a pilot project to evaluate the test protocol on a refinery fluid catalytic cracking unit. Pages 113

March 2002 | Product Number: I47130 | Price: $145.00

Publ 4723
Refinery Stream Speciation

Contains the results of a study to determine the range of compositions for a number of compounds in typical refinery process streams. Data representing 31 refineries, over 20 processes, and over 50 process streams was contributed by the project participants. The results of this project will be of use in estimating the emissions of specific compounds, in preparing permit applications and in other environmental control activities. Neither the Petroleum Environmental Research Forum or the project participants make any claims as to the suitability or acceptability of the stream composition data reported for specific reporting or regulatory purposes. Pages: 325

November 2002 | Product Number: I47230 | Price: $164.00

EMISSIONS: VEHICLES

Publ 4605
Investigation of MOBILE5a Emission Factors: Evaluation of IM240-to-FTP Correlation and Base Emission Rate Equations

TA detailed investigation and critique of the methodology used by the U.S. Environmental Protection Agency to construct the exhaust emission rate equations in MOBILE5a developed from data collected from an operating inspection and maintenance (I/M) program. It includes an extensive critique of the adjustments used to correct I/M program data for variations in fuel

characteristics and temperature conditions and an assessment of the correlations developed to relate emissions data measured in an I/M program to that measured on the Federal Test Procedure. Pages: 45

June 1994 | Product Number: I46050 | Price: $61.00

Publ 4637
Analysis of Causes of Failure in High Emitting Cars

Describes an investigation to evaluate the primary causes of high exhaust emissions from light-duty vehicles on the road. It is an analysis of emissions data from tests previously conducted by the U.S. Environmental Protection Agency (EPA), the California Air Resources Board, and one joint EPA-industry program. The analysis involves a comparison of emissions test data collected both before and after the performance of repairs on 1981 and newer cars and trucks. Emission control defects, their prevalence and overall contribution to fleet emissions are described. Pages: 104

February 1996 | Product Number: I46370 | Price: $70.00

Publ 4642
A Study to Quantify On-Road Emissions of Dioxins and Furans from Mobile Sources: Phase 2

Presents the results of a study to assess on-road emissions of dioxins and furans from light- and heavy-duty vehicles in the United States. This study was conducted in response to the U.S. Environmental Protection Agency's (EPA) draft dioxin reassessment document, which was based on data developed from studies conducted outside of the United States. Emissions were measured in the Fort McHenry Tunnel in Baltimore, MD, based on techniques tested and proven in Phase 1 of this study. The emission factor determined for heavy-duty diesel vehicles in this work was less than the EPA estimate. Pages: 96

December 1996 | Product Number: I46420 | Price: $130.00

Publ 4646
Evaluation of Fuel Tank Flammability of Low RVP Gasolines

Twenty-two test fuels were varied with respect to Reid vapor pressure (RVP), pentane-to-butane ratio, and addition of ethanol and methyl tert-butyl ether (MTBE), to evaluate the conditions under which vapors from reformulated gasoline contained in automobile fuel tanks become flammable. The results show that temperature limits of flammability correlate with RVP; the addition of ethanol or MTBE or both affects the upper flammability limits; and the ratio of pentane to butane has no consistent effect at similar RVP levels. Pages: 144

December 1996 | Product Number: I46460 | Price: $97.00

Publ 4650
Analysis of High-Mileage-Vehicle Emissions Data from Late-Model, Fuel-Injected Vehicles

Seventy-five light-duty vehicles were procured and tested over the Federal Test Procedure to assess whether the U.S. Environmental Protection Agency's (EPA) MOBILE5a on-road emission factors model overpredicted the exhaust emissions of newer-model, fuel-injected vehicles with high mileage. A comparison of the results from vehicles tested in this program to estimates from the EPA MOBILE5a model suggested that the latter may be over-predicting exhaust emissions. This report presents an analysis of the data collected during this project. Pages: 62

February 1997 | Product Number: I46500 | Price: $69.00

EXPOSURE: ASSESSMENT AND MONITORING

Publ 4617
A Monte Carlo Approach to Generating Equivalent Ventilation Rates in Population Exposure Assessments

Describes a study to improve breathing rate simulations in computer-based models used to estimate the exposures of urban populations to ozone and carbon monoxide. Algorithms producing equivalent ventilation rate values according to age, gender, activity, activity duration, and breathing rate category were developed from measured rates in primary-school children, high-school children, outdoor adult workers, and construction workers. Seven additional time/activity databases not used in the current pNEM methodology are described as well as models simulating maximum sustainable ventilation rates as a function of exercise duration, age, and gender. Pages: 168

March 1995 | Product Number: I46170 | Price: $79.00

Publ 4619
A Study to Characterize Air Concentrations of Methyl Tertiary Butyl Ether (MTBE) at Service Stations in the Northeast

Describes a study to measure air concentrations of MTBE; total hydrocarbons; carbon monoxide; formaldehyde; and benzene, toluene, ethylbenzene, and xylenes at 10 service stations in the New York area. Researchers assessed concentrations of MTBE in the areas around gas pumps, at the station perimeters, and in the breathing zones of motorists and attendants. Meteorological parameters, gasoline composition, sales, and deliveries were also monitored. Pages: 144

February 1995 | Product Number: I46190 | Price: $79.00

Publ 4622
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: $61.00

Publ 4625
Service Station Personnel Exposures to Oxygenated Fuel Components

Describes a study in four ozone nonattainment areas to measured exposures of refueling attendants and mechanics to fuel oxygenate species—methyl 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: $65.00

Publ 4629
Hexavalent Chromium Exposures During Hot Work

Details the findings from an air sampling survey contracted by API to evaluate inhalation exposures to hexavalent chromium [chromium (VI)] during seven types of hot work: carbon arc cutting (CAC), flux cored arc welding (FCAW), gas metal arc welding (GMAW or MIG), grinding, gas tungsten arc welding (GTAW or TIG), oxyfuel gas cutting (OFC or torch cutting), and shielded metal arc welding (SMAW or stick). After the First Edition of this report was published, it was determined that 15 samples from one of the projects were listed as carbon steel base metal and should have been listed as stainless steel. While the original report was careful to point out the use of electrodes typical for stainless work, it was felt that a complete update was needed. Eighty-three samples were collected in October and November 2005 at two petroleum sites during maintenance turnarounds by API member companies. An additional 188 samples were collected April–June 2006 at three different petroleum company sites by 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: $85.00

MODELING

Publ 4546
Hazard Response Modeling Uncertainty (a Quantitative Method): Evaluation of Commonly-Used Hazardous Gas Dispersion Models—Volume 2

Contains an evaluation of a group of 14 hazardous gas dispersion models. All available measurement programs were considered for the evaluation, covering both the releases of dense gases and nondense tracer gases; eight data sets are used in the evaluation. The models are reviewed for their scientific validity. Statistical procedures and residual plots are used to characterize performance. A number of the models give predictions that reasonably match field data. Pages: 351

October 1992 | Product Number: I45460 | Price: $142.00

Publ 4628
A Guidance Manual for Modeling Hypothetical Accidental Releases to the Atmosphere

Presents methods for modeling hypothetical accidental releases of fluids and gases into the atmosphere from process operations. Given a particular type of release and the chemicals or petroleum fractions involved, methods for modeling the release and subsequent dispersion phenomena are treated in a step-wise, comprehensive manner. Detailed simulation of eight hypothetical release scenarios are presented to demonstrate how the modeling procedures can be implemented. Pages: 212

November 1996 | Product Number: I46280 | Price: $142.00

Publ 4669
Review of Air Quality Models for Particulate Matter

API has published a review of existing source and receptor models available for analyzing particulate matter (PM) concentrations. This report critically reviews existing air modeling tools for PM, recommends models for State Implementation Plan applications, and identifies areas where the models need improvement. If you would like API to provide you with a hard copy of this publication for a cost of $42.00, please contact the Intellectual Property Department at API, 1220 L Street, NW, Washington, DC 20005; e-mail: apipubs@api.org; phone: 202-682-8156. Pages: 311

March 1998

OZONE

Publ 305
Protecting Agricultural Crops from Ozone Exposures—Key Issues and Future Research Directions

Identifies and reviews some of the key issues related to assessing the effects of ozone exposure on vegetation. This report analyzes information on components of ozone exposure that elicit adverse effects on vegetation; ways to describe these components in the form of ozone exposure indices that may be useful in the standard-setting process for protecting vegetation; the change in nonattainment status that may occur should the existing ozone national ambient air quality standards be modified; and the need for future research efforts to explore the development of a suitable multiparameter index to protect vegetation from ozone exposure. Pages: 156

August 1991 | Product Number: J30500 | Price: $83.00

Publ 309
Current Status and Research Needs Related to Biogenic Hydrocarbons

Describes the literature on the state of science on biogenic hydrocarbons. Among the areas covered are biogenic emission measurements, ambient concentration measurements, emission inventories, chemical kinetics, and modeling studies from 1960 to 1992. The results of the review are used to identify areas of understanding as well as uncertainty in present-day knowledge. A list of references with 163 abstracts is included. Pages: 240

June 1992 | Product Number: J30900 | Price: $113.00

Publ 4616
The Importance of Using Alternative Base Cases in Photochemical Modeling

A series of Urban Airshed Model sensitivity studies were conducted using two summer 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: $137.00

Environment and Safety Data

The following summaries report on cases that are recorded under the U.S. Bureau of Labor Statistics' recordkeeping guidelines. The surveys are based on data submitted to API by oil and gas companies. The reports include information regarding injuries, illness, fatalities, lost workday cases, and incidence rates by function.

1989 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

January 1989 | Product Number: K19996 | Price: $59.00

1990 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

July 1991 | Product Number: K19988 | Price: $83.00

1991 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

September 1992 | Product Number: K19987 | Price: $83.00

1992 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

August 1993 | Product Number: K19986 | Price: $83.00

1993 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

June 1994 | Product Number: K19985 | Price: $96.00

1994 Summary of U.S. Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

June 1995 | Product Number: K19984 | Price: $96.00

1995 Summary of U.S. Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

May 1996 | Product Number: K19983 | Price: $96.00

Publ 2375
1996 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

June 1997 | Product Number: K23751 | Price: $96.00

Publ 2376
1997 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

June 1998 | Product Number: K23761 | Price: $96.00

Publ 2377
1998 Summary of Occupational Injuries, Illnesses, and Fatalities in the Petroleum Industry

March 1999 | Product Number: K23771 | Price: $103.00

Publ 2378
1999 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only
June 2000 | Product Number: K23781 | Price: $103.00

Publ 2379
2000 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only
March 2001 | Product Number: K23790 | Price: $103.00

Publ 2380
2001 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only
March 2002 | Product Number: K23801 | Price: $103.00

Publ 2381
2002 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only
June 2003 | Product Number: K23811 | Price: $103.00

Publ 2382
2003 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only
May 2005 | Product Number: K23821 | Price: $103.00

Publ 2383
2004 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only
March 2005 | Product Number: K23831 | Price: $103.00

Publ 2384
2005 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only
May 2006 | Product Number: K23841 | Price: $103.00

Publ 2385
2006 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only
June 2007 | Product Number: K23851 | Price: $103.00

Publ 2386
2007 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only
May 2008 | Product Number: K23861 | Price: $103.00

Publ 2387
2008 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only
March 2009 | Product Number: K23871 | Price: $103.00

Publ 2388
2009 Survey on Petroleum Industry Occupational Injuries, Illnesses, and Fatalities Summary Report: Aggregate Data Only
April 2010 | Product Number: K23881 | Price: $103.00

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: $79.00

Human Health Related Research

Human Factors in New Facility Design Tool

Describes a human factors tool that may be used by operating plants as an aid to incorporate human factors principles in the design of equipment that will be operated and maintained by people.

The human factors principles described in this document are intended for new equipment designs; however, many ideas provided in this tool may be used to improve the operating of existing plants where feasible.

This document focuses only on equipment design. Items such as human error, behavior-based safety, and operating procedure issues are not in the scope.

The tool covers equipment that is common to both upstream producing and downstream manufacturing operations. Equipment associated with specific activities such as drilling rigs is not specifically addressed. Pages: 71

2nd Edition | October 2005 | Product Number: I0HF02 | Price: $149.00

Human Factors Tool for Existing Operations

Objectives of this tool include the following:

- provide a tool for operating crews to identify opportunities for latent conditions and human error, and
- improve how process hazards analysis/hazard evaluation/revalidation process address human factors.

The scope of this tool includes existing operations and equipment and human tasks.

This tool is intended for use without specific training on human factors. This is a simple process for gathering a few operators and mechanics who are familiar with the equipment/process and who are qualified to identify where traps (latent conditions) in the equipment and tasks (error likely scenarios) exist that make it easy for people to do something wrong. Pages: 14

1st Edition | February 2006 | Product Number: I0HF03 | Price: $62.00

TR 400
Toluene: A Preliminary Study of the Effect of Toluene on Pregnancy of the Rat

Describes a preliminary experiment performed on the pregnant rat to determine appropriate exposure levels of toluene, for future investigation of embryofetal toxicity in the rat when administered via the inhalation route from days 5 to 15 of pregnancy inclusive. The inhalation route of administration was chosen as the most likely route of exposure in humans. The exposure levels were chosen following a review of currently available information. See related document TR 401. Pages: 113

June 1993 | Product Number: I00400 | Price: $61.00

TR 401
Toluene: The Effect on Pregnancy of the Rat

Describes a study to assess the toxicity of toluene on the pregnant rat as well as on the developing fetus. Pregnant rats were exposed to 250, 750, 1500, and 3000 ppm toluene via inhalation for 6 hours a day from days 6 to 15 of pregnancy. Control rats were exposed to filtered air for the same length of time. Throughout the exposure period, animals were observed for clinical signs of toxicity. On day 20, the females were sacrificed and examined for abnormalities. The number and distribution of live young as well as the number of fetal deaths and abnormalities were also recorded. See related document TR 400. Pages: 215

June 1993 | Product Number: I00401 | Price: $87.00

TR 403
Closed-Patch Repeated Insult Dermal Sensitization Study of TAME in Guinea Pigs

Describes a study to evaluate the allergic contact sensitization potential of tert-amyl methyl ether (TAME) in guinea pigs. Observations for mortality were made daily. Body weights were obtained and general health monitored weekly. Dermal evaluations were made approximately 24 and 48 hours after exposure. Pages: 32

February 1995 | Product Number: I00403 | Price: $61.00

TR 404
An Inhalation Oncogenicity Study of Commercial Hexane in Rats and Mice, Part I—Rats

This abridged report, the first part of a two-part set, evaluates the oncogenic potential of commercial hexane administered to four groups of 50 Fischer 344 rats at concentrations of 0, 900, 3000 and 9000 ppm in air. Summary text as well as pertinent data on changes in body weight, pathology, and individual and overall tumor incidence including differences in survivorship between control and exposed groups are provided. The amendment and table of contents to the unabridged final report are included. Pages: 152

January 1995 | Product Number: I00404 | Price: $79.00

TR 405
An Inhalation Oncogenicity Study of Commercial Hexane in Rats and Mice, Part II—Mice

This abridged report, the second part of a two-part set, evaluates the oncogenic potential of commercial hexane administered to four groups of 50 B6C3F1 mice at concentrations of 0, 900, 3000 and 9000 ppm in air. Summary text and pertinent data on differences in survivorship between control and exposed groups, changes in body weight, and pathology are provided. The table of contents to the unabridged final report is included. Pages: 106

January 1995 | Product Number: I00405 | Price: $61.00

TR 409
Primary Skin Irritation Study in Rabbits of API 91-01 and PS-6 Unleaded Test Gasolines

Describes a study conducted to assess primary dermal irritation data for two motor fuels according to Toxic Substances Control Act and Federal Hazardous Substances Act guidelines. Test rabbits were exposed dermally to unleaded gasoline according to a specified protocol and observed daily for signs of skin irritation. Such information is valuable for accurate hazard assessment and first aid treatment. Pages: 58

March 1995 | Product Number: I00409 | Price: $61.00

TR 410
Chromosome Aberrations in Chinese Hamster Ovary (CHO) Cells Exposed to Tertiary Amyl Methyl Ether (TAME)

Evaluates the clastogenic potential of TAME using CHO cells compared to the solvent control group. Based on the findings of this study, TAME was concluded to be positive for the induction of structural chromosome abberations in CHO cells. Pages: 56

December 1996 | Product Number: I00410 | Price: $87.00

TR 411
Chinese Hamster Ovary (CHO) HGPRT Mutation Assay of Tertiary Amyl Methyl Ether (TAME)

Describes a study conducted to evaluate the mutagenic potential of the test article, TAME based on quantitation of forward mutations at the hypoxanthine-guanine phosphoribosyl transferase (HGPRT) locus of CHO cells. Under the conditions of this study, TAME was concluded to be negative in the CHO/HGPRT mutation assay. Pages: 46

December 1996 | Product Number: I00411 | Price: $87.00

TR 412 and TR 414
A Range-Finding Developmental Inhalation Toxicity Study of Unleaded Gasoline Vapor Condensate in Rats and Mice via Whole-Body Exposure and an Inhalation Developmental Toxicity Study of Unleaded Gasoline Vapor Condensate in the Rat via Whole-Body Exposure

This two-part inhalation study sought to specifically evaluate the potential of unleaded gasoline for developmental toxicity in rodents. The composition of the unleaded gasoline vapor condensate and the treatment pattern used are representative of real-world exposure conditions encountered at service stations and in other occupational settings. The results show that developmentally there were no differences between treated and control groups in malformations, total variations, resorptions, fetal body weight, or viability. Under the conditions of the study, unleaded gasoline vapors did not produce evidence of developmental toxicity. (This volume includes publications TR 412 and TR 414.) Pages: 300

April 1998 | Product Number: I00412 | Price: $97.00

Publ 4592
Odor Threshold Studies Performed with Gasoline and Gasoline Combined with MTBE, ETBE and TAME

Examines the effects on odor detection and recognition of adding oxygenates such as methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), and tertiary amyl methyl ether (TAME), to gasoline. Commercial grade MTBE is also evaluated for its taste threshold in water. The odor detection threshold is the minimum concentration at which 50 % of a given population can differentiate between a sample containing the odorant and a sample of odor-free air. The recognition threshold is the minimum concentration at which 50 % of a given population can recognize the odorant. The addition of 11 % to 15 % by volume MTBE or 15 % by volume of TAME or ETBE reduce the odor detection and recognition thresholds of gasoline. Pages: 76

January 1994 | Product Number: I45920 | Price: $79.00

Publ 4623
Anecdotal Health-Related Complaint Data Pertaining to Possible Exposures to Methyl Tertiary Butyl Ether (MTBE): 1993 and 1994 Follow-Up Surveys

Describes the development and administration of an informal survey of API member companies and state agencies to acquire anecdotal complaint data relating to MTBE exposure. Data associated with 71 occupational and 13 nonoccupational health-related complaints including reported symptoms are presented. Pages: 33

September 1995 | Product Number: I46230 | Price: $61.00

Publ 4634
Index and Abstracts of API Health-Related Research

This compendium of health-related research provides author, organization, and subject indices for research investigations and scientific reviews conducted for API between 1959 and 1994. It covers industrial hygiene and exposure assessment, toxicology, environmental biology, product safety, and community and occupational health research areas. Informative abstracts provide useful background on each study and give information on publication availability. Pages: 160

September 1995 | Product Number: I46340 | Price: $79.00

Publ 4647
Brain Glial Fibrillary Acidic Protein (GFAP) as a Marker of Neurotoxicity During Inhalation Exposure to Toluene

Evaluates the concentration of GFAP in the rat's brain as a practical biomarker of toluene-induced neurotoxicity. Adult male rats received inhalation exposure to toluene 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: $79.00

Publ 4648
Human Neurobehavioral Study Methods: Effects of Subject Variables on Results

Behavioral tests from two consensus neurotoxicity batteries were administered to 715 subjects aged 26–45. These people had 0–18 years of education and represented the following cultural groups: European-descent majority, Native American Indian, African American, and Latin American. Differences in educational level and locale (rural vs. urban) and gender were examined. All factors affected the outcome of the behavioral tests studied. Results suggested that education and cultural group should be controlled in the design of the study rather than in the statistical analysis, and failure to do so could lead to false conclusions about the presence or absence of neurotoxic effects. Pages: 110

December 1996 | Product Number: I46480 | Price: $97.00

Publ 4689
Chemical Human Health Hazards Associated with Oil Spill Response

Contains an overview of human health hazards that could be encountered by personnel involved with spills or leaks of petroleum products. The discussion includes potential risks of basic components and products of concern. Environmental factors that may affect exposure and a brief summary of other exposure considerations are also included. Pages: 51

August 2001 | Product Number: I46890 | Price: $83.00

Publ 4743
Hazard Narrative for Tertiary-Butyl Alcohol (TBA), CAS Number 75-65-0

The purpose of this investigation was to conduct a quantitative risk assessment according to U.S. Environmental Protection Agency guidelines in which data on the mode of action by which TBA induced renal tumors in rats and thyroid tumors in mice was considered. When data from animal studies, such as the TBA bioassays, are extrapolated to humans to provide estimates of lifetime cancer risks, then potential differences in pharmacokinetics (metabolism) and pharmacodynamics (sensitivity and mode of action) between the animal species and humans is considered in the estimation of human equivalent doses and in extrapolation from high doses typically used in the animal bioassays to low doses to which humans may be potentially exposed. Pharmacokinetic, toxicity, and mode of action data for TBA were reviewed and data selected for quantitative dose-response modeling. Pages: 76

November 2005 | Product Number: I47430 | Price: $149.00

Publ 45592
Results of Toxicological Studies Conducted for the American Petroleum Institute Health and Environmental Sciences Department

Lists and provides the results through December 1994 of all toxicological studies performed on petroleum-based materials, including gasoline and gasoline streams, middle distillates, lubes, heavy fuels, solvents, shale oils, and miscellaneous products. It also provides details of the tests performed and the species tested. A three-ring binder is provided to house this edition and future updates. Pages: 190

January 1995 | Product Number: I45592 | Price: $79.00

Natural Resource Damage Assessment

Publ 304
Evaluation of Restoration Alternatives for Natural Resources Injured by Oil Spills

Builds upon previous work in the field of oil spill impact assessment and habitat restoration to assess the technical feasibility and practicality of proactive restoration following oil spills and presents an approach for evaluating tradeoffs between natural recovery and active restoration. The scenarios developed to represent a broad spectrum of possible oil spills were based on selected case studies. The report concludes that in general, available restoration techniques are not very effective for enhancing natural recovery and may, in certain cases, cause more severe impacts than the oil spill alone. Pages: 171

1st Edition | October 1991 | Product Number: J30400 | Price: $83.00

Publ 316
Identifying and Measuring Nonuse Values for Natural and Environmental Resources: A Critical Review

Takes an in-depth look at the theoretical arguments for using the contingent value method (CVM) as a scientifically valid and reliable tool for valuing nonuse public goods, specifically, environmental resources. The theory of option value is used to frame the concept of nonuse; prominent studies that feature nonuse measurement are highlighted. The potential biases of the CVM method are mentioned with suggestions on improving values. Pages: 134

August 1995 | Product Number: J31600 | Price: $59.00

DR 342
Toxicity Bioassays on Dispersed Oil in the North Sea: June 1996 Field Trials

The purpose of the study described in this report was to gain more information on water column impacts by taking advantage of the ongoing efficacy and monitoring studies done by the Norwegian Clean Seas Association for Operating Companies (NOFO) in order to conduct field toxicity tests.

The goal of this study was to obtain field effects data using shipboard, real-time toxicity tests with field water. These data can then be used in the future to link field effects to laboratory toxicity data. Pages: 108

June 2002 | Product Number: I34200 | Price: $139.00

Publ 4594
A Critical Review of Toxicity Values and an Evaluation of the Persistence of Petroleum Products for Use in Natural Resource Damage Assessments

This document and accompanying 3.5-in. diskette provide a review of the literature (post-1970) on the toxicity of 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: $117.00

Pollution Prevention

Publ 300
The Generation and Management of Waste and Secondary Materials in the Petroleum Refining Industry

In 1989, API initiated a census survey of domestic refineries to document the management of waste and secondary materials in 1987 and 1988. Outstanding responses by the refineries (115 out of the total U.S. population of 176 refineries participated) aided in making confident estimates of the amount of waste managed by the U.S. refining industry. Pages: 184

February 1991 | Product Number: J30000 | Price: $74.00

Publ 302
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: $90.00

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: $90.00

Publ 311

Environmental Design Considerations for Petroleum Refining Processing Units

Demonstrates the application of pollution prevention concepts in the design of a refinery crude processing unit. Included are realistic waste and emission reduction changes that would be economically and technically attractive to refiners. The document is intended to serve as a reference for refinery designers during the preliminary design phase of building a new crude unit or revamping an existing crude unit. Pages: 214

February 1993 | Product Number: J31100| Price: $148.00

Publ 31101

Executive Summary: Environmental Design Considerations for Petroleum Refining Crude Processing Units

Executive summary to Publ 311. Pages: 13

February 1993 | Product Number: J31101 | Price: $58.00

Publ 312

Responding to Environmental Challenge: The Petroleum Industry and Pollution Prevention

Informal proceedings of a pollution prevention plenary session held at API's 1990 Health and Environment Annual Meeting. Speakers representing federal and state government, public interest groups, and various petroleum industry segments presented their views on pollution prevention. This document also describes API's initiatives for pollution prevention research. Pages: 16

1990 | Product Number: J31200 | Price: Free*

Publ 317

Industry Experience with Pollution Prevention Programs

The API Pollution Prevention Task Force has been actively involved in promoting pollution prevention within the industry since 1990. Members of the Task Force have accumulated a comprehensive body of knowledge on the subject of pollution prevention and have compiled a resource brochure on the key elements that make pollution prevention programs successful. Pages: 4

June 1993 | Product Number: J31700 | Price: Free*

Publ 324

Generation and Management of Residual Materials: Petroleum Refining Performance

This document is third in a series that presents the results of API's annual survey of the types and amounts of wastes and residuals generated and managed by the petroleum refining industry. For 1990, source reduction activities doubled over the previous year. The quantity of residuals generated increased to 18.2 million wet tons as compared to 16.3 million wet tons in 1989. Much of the increased quantity reflects generation peaks associated with construction and remediation activities. Two long-term trends are worth noting: (1) the amount of total residuals being recycled continues to rise, and (2) the amount of hazardous wastes going to land treatment and disposal continues to fall. Pages: 123

August 1993 | Product Number: J32400 | Price: $89.00

Publ 329

Generation and Management of Residual Materials: Petroleum Refining Performance

This document is the fourth in a series that describes the 1991 data from API's annual survey of the types and amounts of residual materials generated and managed by the refining industry. In 1991, the industry generated 14.8 million wet tons of residual materials—the smallest quantity generated since API began this collection effort in 1987. The industry also reported that pollution prevention activities accounted for a reduction in 715,000 wet tons of materials. A trend analysis was performed on the last five years. Oil companies can use the data in this report to compare their residual generation and management practices with the rest of the industry. Pages: 172

June 1994 | Product Number: J32900 | Price: $100.00

Publ 331

Environmental Performance Indicators: Methods for Measuring Pollution Prevention

Presents methods that can be used to measure progress toward pollution prevention. It investigates a series of measurement parameters presented in five categories: program-based, activity-based, mass-based, normalized efficiency, and concentration-based. Within each category of measures, the benefits and limitations are discussed and illustrated with industry examples. Pages: 30

September 1994 | Product Number: J33100 | Price: $63.00

Publ 333

Generation and Management of Residual Materials

This report is the fifth in a series of reports detailing waste and residual 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: $100.00

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: $100.00

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: $100.00

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: $100.00

Soil and Groundwater Research

www.api.org/groundwater

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: $59.00

API Soil and Groundwater Research Bulletins

API Soil and Groundwater Research bulletins summarize research results from project overseen by API's Soil and Groundwater Technical Task Force. The Task Force disseminates information and research results through publications, presentations, and interaction with industry clients and regulatory agencies.

The bulletins listed below can be downloaded at www.api.org/environment-health-and-safety/clean-water/ground-water/bulletins.aspx.

Bulletin No. 1

Summary of Processes, Human Exposures and Remediation Technologies Applicable to Low Permeability Soils

September 1996

Bulletin No. 3

Ten Frequently Asked Questions About MTBE in Water

March 1998

Bulletin No. 5

Evaluation of Sampling and Analytical Methods for Measuring Indicators of Intrinsic Bioremediation

March 1998

Bulletin No. 8

Characteristics of Dissolved Petroleum Hydrocarbon Plumes: Results from Four Studies

December 1998

Bulletin No. 9

Non-Aqueous Phase Liquid (NAPL) Mobility Limits in Soil

June 2000

Bulletin No. 10

Simulation of Transport of Methyl Tert-Butyl Ether (MTBE) to Ground-Water from Small-Volume Releases of Gasoline in the Valdose Zone

June 2000

Bulletin No. 11

Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE

August 2000

Bulletin No. 12

No-Purge Sampling: An Approach for Long-Term Monitoring

October 2000

Bulletin No. 13

Dissolution of MTBE from a Residually Trapped Gasoline Source

September 2001

Bulletin No. 14

Predicting the Effect of Hydrocarbon and Hydrocarbon-Impacted Soil on Groundwater

September 2001

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

May 2003

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

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: $61.00

Publ 4593
Transport and Fate of Non-BTEX Petroleum Chemicals in Soils and Groundwater

This literature survey documents available information on the chemical composition of petroleum products and the subsurface fate and transport of selected non-BTEX (benzene, toluene, ethylbenzene, and xylenes) constituents of these products. The evaluation focuses on a representative group of 12 hydrocarbons and hetero-organic compounds based on their abundance in petroleum products and anticipated future interest from regulatory agencies. Pages: 200

September 1994 | Product Number: I45930 | Price: $65.00

Publ 4601
Transport and Fate of Dissolved Methanol, MTBE and Monoaromatic Hydrocarbons in a Shallow Sand Aquifer

Describes a field investigation into the effect of oxygenates methanol and methyl tertiary-butyl ether (MTBE) on the fate and transport of benzene, toluene, ethylbenzene, and xylenes (BTEX) in groundwater. Natural gradient tracer experiments were conducted to simulate the transport of dissolved plumes resulting from subsurface releases of oxygenated fuels. In these experiments, methanol, MTBE, and BTEX concentrations were monitored by sampling from a dense network of multilevel piezometers, and plume contours were mapped through application of moment analysis. A laboratory study on the effects of methanol and MTBE on the biodegradation of BTEX in groundwater was also conducted. The relative mobility and persistence of BTEX and the oxygenates were characterized based on field and laboratory study data. Pages: 338

April 1994 | Product Number: I46010 | Price: $123.00

Publ 4627
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: $61.00

Publ 4633
Barium in Produced Water: Fate and Effects in the Marine Environment

Provides a summary of what is currently known about the physical and chemical behavior of barium in produced water and in the ocean. It discusses the factors that influence the rate of precipitation of barium as barite. The toxicity of barium to marine and freshwater organisms and humans is discussed in relation to the concentrations and forms in which it occurs in aquatic environments. Pages: 68

September 1995 | Product Number: I46330 | Price: $59.00

Publ 4643
Estimation of Infiltration and Recharge for Environmental Site Assessment

A risk-based corrective action analysis of a site suspected of chemical contamination requires site-specific knowledge of the rate water infiltrates through the soil to the water table. A comprehensive discussion of the current physical/chemical methods and mathematical models available to quantify those rates along with suggestions for selecting an appropriate technique, depending on site conditions, are provided in this report. Pages: 204

July 1996 | Product Number: I46430 | Price: $97.00

Publ 4654
Field Studies of BTEX and MTBE Intrinsic Bioremediation

A gasoline release field site in the Coastal Plain of North Carolina was monitored for more than three years to allow calculation of in-situ biodegradation rates. Laboratory microcosm experiments were performed to further characterize the biodegradation of benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tertiary-butyl ether (MTBE) under ambient, in-situ conditions. Finally, groundwater modeling studies were conducted to facilitate the interpretation of field data and to evaluate various approaches for predicting the fate and effects of these gasoline constituents in the subsurface. Pages: 244

October 1997 | Product Number: I46540 | Price: $76.00

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: $79.00

Publ 4734

Modeling Study of Produced Water Release Scenarios

Provides a scientific basis for operators, regulators, and landowners to determine if assessment or remediation of produced water releases will provide a meaningful environmental benefit.

The two principal research objectives of this study are (1) the identification of produced water release scenarios that have a potential to cause groundwater quality impairment in homogeneous subsurface geologic profiles and (2) the prediction of chloride movement through the vadose zone for different release scenarios. Secondary objectives of the study included evaluation of the effect of heterogeneity on the migration of chloride through the vadose zone, the impact of repeat releases, and the effect on groundwater quality of surface soil restoration by revegetation and soil leaching.

The sensitivity analysis performed in this study provides an overview of the likelihood of groundwater impairment for large release volumes (100 bbls and 10,000 bbls). Assuming homogeneous unsaturated zone soil profiles, the results of over 1000 modeled release scenarios reveal that 49 % of single-event releases do not cause impairment of groundwater above drinking water standards for chloride (250 mg/L) in a monitoring well that is adjacent to the edge of the release. In 70 % of these scenarios, chloride concentrations in groundwater do not exceed 1000 mg/L. Although these numbers give no information about the fate of chloride from a specific produced water release, they do indicate that a release does not necessarily cause groundwater impairment. Pages: 124

January 2005 | Product Number: I47340 | Price: $123.00

Publ 4758

Strategies for Addressing Salt Impacts of Produced Water Releases to Plants, Soil, and Groundwater

The exploration and production industry uses great care during the handling and disposal of the produced water that is generated as part of oil and gas production. However, unintentional releases can occur. Depending on the chemical composition of the produced water and the nature of the local environment, salts associated with such releases can impair soils, vegetation, and water resources.

Provides a collection of simple rules of thumb, decision charts, models, and summary information from more detailed guidance manuals to help you address the following assessment and response issues:

- Will a produced water release cause an unacceptable impact on soils, plants, and/or groundwater?
- In the event of such an impact, what response actions are appropriate and effective? Pages: 29

1st Edition | September 2006 | Product Number: I47580 | Price: $70.00

Publ 4774

The Environmental Behavior of Ethylene Dibromide and 1,2-Dichloroethane in Surface Water, Soil, and Groundwater

Reviews the available environmental fate literature for two compounds, ethylene dibromide (EDB) and 1,2-dichloroethane (1,2-DCA). While these particular names suggest that these two compounds have different structures, EDB and 1,2-DCA are structurally similar. Neither compound contains a double bond despite the common names of ethylene dibromide and ethylene dichloride. The two structures differ only with the presence of either bromine or chlorine substituents.

EDB was previously used as a soil fumigant and as a leaded gasoline additive while 1,2-DCA is currently produced in large quantities as a commercial chemical (nearly 8.2 billion kilograms in the mid-1990s) with most of this, >96 %, used as a chemical intermediate. 1,2-DCA was also used as a leaded gasoline additive. The current presence of 1,2-DCA in air, surface water, and groundwater samples can be attributed mainly to its high production volume. EDB is not typically found in recent air or surface water samples since its use as a soil fumigant, and leaded gasoline additive are no longer permitted by the U.S. Environmental Protection Agency. However, it has been reported in groundwater and soil samples affected by historical uses.

Provides a review of environmental fate data for both compounds as well as monitoring data from sites where direct release occurred and from larger monitoring studies where concentrations cannot be attributed to a single release. Section II briefly describes the literature search process. Section III contains all available environmental information for EDB, while Section IV contains the available information for 1,2-DCA. Within Sections III and IV, transport processes are considered initially, followed by abiotic and biotic transformation processes, and then monitoring data. While EDB and 1,2-DCA are considered separately, the environmental processes relevant for each compound are expected to be similar. For example, the physical trapping of pure EDB by soil samples was well studied because of its use as a soil fumigant. Similar studies were not conducted for 1,2-DCA; however, based on the mechanism reported for EDB and the structural similarity of the two compounds, it is likely to be important for 1,2-DCA as well. In such cases, the reader is referred back to the relevant section of the report where the original data are reported. Pages: 142

December 2008 | Available for download at www.api.org/ehs/groundwater/upload/4774_e1.pdf

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: $97.00

Publ 4525

A Compilation of Field-Collected Cost and Treatment Effectiveness Data for the Removal of Dissolved Gasoline Components from Groundwater

Documents, summarizes, and evaluates cost and treatment effectiveness data for air stripping and carbon adsorption systems designed to remove dissolved petroleum hydrocarbons from groundwater. The compounds of primary interest were benzene, toluene, ethylbenzene, and xylene isomers (BTEX) as well as the oxygenates methyl tertiary-butyl ether and isopropyl

ether. Operating data were gathered from 57 field sites throughout the United States, and treatment system profiles were generated for each site. The data will be used to assist companies in planning pump-and-treat remediation systems for removal of BTEX and oxygenates from groundwater. Pages: 240

November 1990 | Product Number: I45250 | Price: $79.00

Publ 4609

In-Situ Air Sparging: Evaluation of Petroleum Industry Sites and Considerations for Applicability, Design and Operation

Describes the important literature findings as well as the hands-on experiences of the petroleum industry at 59 air sparging sites. Design and operational data are analyzed for relationships that can be used to optimize the technology or provide a better understanding of its fundamental processes. Topics covered include: site characterization; pilot testing; system design and installation; and system operation, monitoring, and performance. Pages: 132

May 1995 | Product Number: I46090 | Price: $97.00

Publ 4631

Petroleum Contaminated Low Permeability Soil: Hydrocarbon Distribution Processes, Exposure Pathways and In-Situ Remediation Technologies

Presents a set of 10 papers on light nonaqueous phase liquids (LNAPLs) in low permeability soils. Collectively, the papers address four key areas: (1) processes affecting the migration and removal of LNAPLs; (2) exposure potential posed by clay soil and hydrocarbons via soil, groundwater, and air pathways; (3) models for predicting LNAPL removal; and (4) techniques of remediation. Pages: 298

September 1995 | Product Number: I46310 | Price: $87.00

Publ 4655

Field Evaluation of Biological and Non-Biological Treatment Technologies to Remove MTBE/Oxygenates from Petroleum Product Terminal Wastewaters

A pilot/demonstration study was conducted on three treatment technologies—the fluidized bed biological reactor process, the activated sludge process incorporated with iron flocculation, and the ultraviolet light/hydrogen peroxide process—to evaluate their effectiveness in the treatment of petroleum marketing terminal wastewater contaminated with methyl tert-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: $123.00

Publ 4671

Technical Bulletin on Oxygen Releasing Materials for In-Situ Groundwater Remediation

Oxygen releasing materials (ORMs) are commercially available materials that are being used to enhance bioremediation treatment of petroleum hydrocarbon contaminated groundwater aquifers. This technical bulletin provides a systematic approach for evaluating the utility of ORM treatment and for designing ORM installations. It summarizes the current state of understanding of this technology to provide guidance for site managers evaluating options for enhanced groundwater remediation. Pages: 52

July 1998 | Product Number: I46710 | Price: $70.00

Publ 4715

Evaluating Hydrocarbon Removal from Source Zones and its Effect on Dissolved Plume Longevity and Concentration

Provides valuable information and utilities for regulators and practitioners interested in understanding the possible benefits of free-product removal. This report provides theory and concepts needed to evaluate light nonaqueous phase liquid (LNAPL) source distribution, chemistry, dissolution, and the effects various remediation strategies may have on risk reduction for the groundwater and vapor exposure pathways. The companion software, API-LNAST, links the multiphase and chemical processes controlling in-situ LNAPL distribution, mobility, and cleanup to quantify estimates of the time-dependent concentrations within the LNAPL source and the down gradient dissolved plume. API-LNAST users can screen whether incremental LNAPL removal provides any risk-reduction benefit over a time frame of interest, e.g. 30 years.

September 2002 | Software and documentation can be downloaded at www.api.org/lnapl

Publ 4730

Groundwater Remediation Strategies Tool

Provides strategies for focusing remediation efforts on (1) the change in contaminant mass flux in different subsurface transport compartments (e.g. the vadose zone, smear zone, or a zone within an aquifer of interest) and (2) the change in remediation timeframe.

In this approach, groundwater flow and contaminant concentration data are combined to estimate the rate of contaminant mass transfer past user-selected transects across a contaminant plume. The method provides the user with a means to estimate the baseline mass flux and remediation timeframe for various transport compartments and then evaluate how different remedies reduce the mass flux and the remediation timeframe in each transport compartment. Pages: 71

December 2003 | Product Number: I473000 | Price: $127.00

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 www.api.org/environment-health-and-safety/clean-water/ground-water/lnapl/ldrm-form.aspx

Publ 4762 ■

API LNAPL Transmissivity Workbook: A Tool for Baildown Test Analysis-User Guide

LNAPL transmissivity is a measure of lateral mobility of free-product hydrocarbon liquid within the groundwater environment. The magnitude of LNAPL transmissivity has been suggested as a possible endpoint criterion for LNAPL mass removal using LNAPL hydraulic recovery systems. Such hydraulic recovery systems include skimmer wells, single-pump wells, dual-pump wells, and trenches. Coupled with the LNAPL CSM, the magnitude of LNAPL transmissivity will assist in the selection of recovery system. As such, methods and their consistent application for estimating LNAPL transmissivity are significant. Perhaps the simplest methods for estimating LNAPL transmissivity are borehole slug test methods, or baildown tests, in which a volume of LNAPL is rapidly removed from a well and the rate of fluid-level recovery (water and LNAPL) is measured and analyzed. Several analytical methods are available to analyze the data from baildown tests to estimate LNAPL transmissivity and described herein. Following a brief description of suggested well configuration, pre-test and test measurements and methods, application of the spreadsheet tool is discussed. Subsequent sections provide a more detailed discussion of significant parameters and basis for

the various analysis procedures. A number of example applications are presented. Further details on the different methods are provided in the appendices. Pages: 40

April 2016 | Product Number: I47620 | For a free copy of this document, please visit http://www.api.org/~/media/4762%20LNAPL%20Tn%20wkbk%20Baildown%20userguide%20Apr2016%20(2).pdf

SITE CHARACTERIZATION

Publ 4599
Interlaboratory Study of Three Methods for Analyzing Petroleum Hydrocarbons in Soils

Presents the results of an interlaboratory study of three methods—diesel-range organics, gasoline-range organics, and petroleum hydrocarbons—used to analyze hydrocarbons in soils. Each method is validated, its performance judged from measurements of accuracy and precision, and practical qualification levels are estimated for each method. The full text of each method is included in the report. Pages: 166

July 1994 | Product Number: I47990 | Price: $97.00

Publ 4635
Compilation of Field Analytical Methods for Assessing Petroleum Product Releases

Presents a compilation of the most widely used field analytical methods available to perform on-site analyses of organic compounds in soil and groundwater. These methods include total organic vapor analyzers, field gas chromatography, immunoassay, infrared analyzers, and dissolved oxygen/oxidation-reduction potential electrodes. Practical applications and limitations of each method are discussed and an objective-oriented data quality classification scheme is presented to assist in selecting an appropriate method. Information is also presented on emerging technologies. Pages: 100

December 1996 | Product Number: I46350 | Price: $87.00

Publ 4657
Effects of Sampling and Analytical Procedures on the Measurement of Geochemical Indicators of Intrinsic Bioremediation: Laboratory and Field Studies

Evaluates the effects of various sampling and analytical methods of collecting groundwater geochemical data for intrinsic bioremediation studies. Sampling and analytical methods were tested in the laboratory and in the field. Several groundwater sampling and analytical methods may be appropriate for measuring geochemical indicators of intrinsic bioremediation. The methods vary in accuracy, level of effort, and cost. Pages: 86

November 1997 | Product Number: I46570 | Price: $61.00

Publ 4658
Methods for Measuring Indicators of Intrinsic Bioremediation: Guidance Manual

Intended to be a resource for practitioners of intrinsic bioremediation in allowing selection of sampling and analytical methods that meet project-specific and site-specific needs in scoping field investigations, providing procedures that will improve the representative quality of the collected data, and considering potential biases introduced into data through the sampling and analytical techniques employed in the site investigation. Pages: 96

November 1997 | Product Number: I46580 | Price: $70.00

Publ 4659
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: $117.00

Publ 4668
Delineation and Characterization of the Borden MTBE Plume: An Evaluation of Eight Years of Natural Attenuation Processes

In 1988, a natural gradient tracer test was performed in the shallow sand aquifer at Canada Forces Base Borden to investigate the fate of a methyl tertiary-butyl-ether (MTBE) plume introduced into the aquifer. Solutions of groundwater mixed with oxygenated gasoline were injected below the water table along with chloride (Cl^-), a conservative tracer. The migration of benzene, toluene, ethylbenzene, and 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: $61.00

Publ 4670
Selecting Field Analytical Methods—A Decision-Tree Approach

Presents a decision-tree approach for selecting and using field analytical methods for on-site analyses of organic compounds in soil, groundwater, and soil gas samples at petroleum release sites. This approach will assist project or site managers with guidance for on-site investigations from initial site assessment to site closure. The decision-tree charts are supported by quality control packages to increase the credibility of the data by documenting method performance. The publication also provides training suggestions for personnel who will perform the testing. Easy to use checklists for field quality control and formal documentation are included. Pages: 88

August 1998 | Product Number: I46700| Price: $87.00

Publ 4699
Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE

Applies the principles of risk-informed decision making to the evaluation of methyl tertiary-butyl ether (MTBE)-affected sites by adding exposure and risk considerations to the traditional components of the corrective action process. The risk factors at a given site are evaluated through a "conceptual site model," which is an inventory of all known or potential oxygenate sources, pathways, and receptors. Based on these risk factors, three levels of assessment are defined: standard, limited, and detailed. The appropriate level of assessment is initially determined based on receptor data, which can typically be obtained from a survey of nearby wells and land uses. A subsurface investigation may then be conducted to obtain information on sources and pathways. The level of assessment can be "upgraded" or "downgraded" as warranted by the resulting source and pathway information. Includes a review of the chemical properties and subsurface behavior of MTBE and other oxygenated fuel additives. It also provides an overview of characterization monitoring issues at oxygenate release sites, as well as a detailed review of the tools and techniques used for subsurface assessment. The expedited site assessment process and the use of modern direct-push tools are particularly emphasized, since these approaches are especially well suited for use at MTBE-affected sites. Pages: 120

February 2000 | www.api.org/mtbe

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: $83.00

Publ 4711

Methods for Determining Inputs to Environmental Petroleum Hydrocarbon Mobility and Recovery Models

This publication is an invaluable reference for operators, consultants and regulators responsible for cleanup of subsurface petroleum releases. Important fluid and soil property parameters are explained. Methods to measure each parameter are presented in order of relevance for use in environmental free-product mobility/recovery assessments. Fluid property parameters covered include density, viscosity, surface tension, and interfacial tension. Laboratory-scale soil property parameters include: capillary pressure vs. saturation, relative permeability vs. saturation, water and nonaqueous phase liquid saturation, and Brooks-Corey and van Genuchten model parameters. Field-scale bail-down and production tests are explained and cited. Sample collection and handling procedures are summarized. A listing and abstract of relevant ASTM methods are provided in the appendix. Pages: 72

July 2001 | Product Number: I47110 | Price: $112.00

Publ 4731

Light Non-Aqueous Phase Liquid (LNAPL) Parameters Database—Version 2.0—Users Guide

A collection of information about samples that have had their capillary parameters determined, as well as other physical parameters measured. Capillary properties are critical in multiphase calculations, and those results have very high sensitivity to these properties. The primary purpose of this database is to provide information to users who are trying to characterize the movement and distribution of LNAPL within a site that has a limited set of direct observations of the capillary properties of the site. Other databases of related parameters have typically been derived from measurements in the agricultural or the petroleum extraction industries; neither being necessarily representative of near-surface environmental conditions. This database 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: $127.00
The database is available from API's website:
www.api.org/environment-health-and-safety/clean-water/ground-water/lnapl/lnapl-params-db.aspx

Publ 4739

API Interactive LNAPL Guide—Version 2.0

A comprehensive and easy-to-use electronic information system and screening utility. The guide is designed to provide an overall approach for evaluating light nonaqueous phase liquid (LNAPL) at a site, assessing its potential risk, quantitatively defining mobility and recoverability, developing remedial strategies, and examining methods to enhance site closure opportunities.

The guide includes the following:

- 11 primers covering all aspects of LNAPL from LNAPL basics to remediation;
- 14 assessment tools, including API-LNAST Version 2.0, "Charbeneau" spreadsheets for LNAPL recovery (August 2003), the API LNAPL Parameter Database;
- LNAPL decision-making frameworks;
- videos and animated figures; and
- an extensive reference list.

August 2004 | Available for download at
www.api.org/environment-health-and-safety/clean-water/ground-water/lnapl/api-interactive-lnapl-guide.aspx

Publ 4761

Technical Protocol for Evaluating the Natural Attenuation of MtBE

Addresses data collection, evaluation, and interpretation procedures that consider the physical, chemical, and biological properties of methyl tert-butyl ether (MtBE) and other oxygenates and degradation byproducts. A tiered approach is provided that can be used by stakeholders to interpret several lines of evidence to evaluate natural attenuation on a site-specific basis. Several resources are provided to support an MNA evaluation, including the following:

- a review of basic scientific principles relevant to the evaluation of MtBE natural attenuation, including biodegradation and physicochemical attenuation mechanisms;
- a discussion of data that can be used to assess MtBE (and other oxygenates or degradation byproducts) natural attenuation;
- technical references for relevant chemical properties, analytical methods, and field sampling techniques;
- guidance for data quality assurance and interpretation, including statistical analysis; and
- guidance on the presentation of natural attenuation data/information to facilitate regulatory and other stakeholder review and acceptance of MNA remedies. Pages: 186

May 2007 | Available from API's website: www.api.org/mtbe

Environmental Stewardship Program Publications

RP 75

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

Provides guidance for use in preparing safety and environmental management programs for oil, gas, and sulphur operations and facilities located on the outer continental shelf (OCS). These guidelines are applicable to well drilling, servicing, and production and pipeline facilities and operations that have the potential for creating a safety or environmental hazard at OCS platform sites. Eleven major program elements are included for application to these facilities and operations. Identification and management of safety and environmental hazards are addressed in design, construction, start-up, operation, inspection, and maintenance of new, existing, and modified facilities Pages: 41

3rd Edition | May 2004 | Reaffirmed: April 2013
Product Number: G07503 | Price: $89.00

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

Chinese translation of RP 75.

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

Publ 9100
Model Environmental, Health and Safety (EHS) Management System and Guidance Document

Comes with a binder complete with both Publ 9100A and Publ 9100B—see descriptions listed below. Pages: 65

October 1998 | Product Number: R9100S | Price: $157.00

Publ 9100A
Model Environmental, Health and Safety (EHS) Management System

Intended to be used as a voluntary tool to assist companies interested in developing an EHS management system or enhancing an existing system. The model, which applies a quality systems approach to managing EHS activities, focuses on people and procedures by pulling together company EHS policies, legal requirements, and business strategies into a set of company or facility expectations or requirements.

Please refer to the companion document Publ 9100B for additional information. Publ 9100A and Publ 9100B are intended to be companion documents and can be purchased as a set or individually. Pages: 20

October 1998 | Product Number: R9100A | Price: $76.00

Publ 9100B
Guidance Document for Model EHS Management System

Provides assistance to corporate and operating organization employees who are developing, implementing, and assessing environmental, health and safety management systems. It intends to serve as self-study source material that enhances efficiency of interchange among employees by use of common terminology, clarifies relationships between operating and other systems, describes how to evaluate effectiveness of an EHS management system and its elements, and facilitates system continuity over time.

Those using this guidance document should be familiar with Publ 9100A. Publ 9100A, and Publ 9100B are intended to be companion documents and can be purchased as a set or individually. Pages: 43

October 1998 | Product Number: R9100B | Price: $109.00

Storage Tank Research

Publ 301
Aboveground Storage Tank Survey: 1989

Presents a survey of petroleum aboveground storage tanks. Estimates are made of the number, capacity, and age of the tanks in each sector of the petroleum industry. Survey forms and statistical extrapolations methodology are included in the report. Pages: 44

April 1989 | Product Number: J30100 | Price: $63.00

Publ 306
An Engineering Assessment of Volumetric Methods of Leak Detection in Aboveground Storage Tanks

Provides the results of a leak detection project in aboveground storage tanks that utilized volumetric methods to detect leaks. A series of field tests were conducted on a 114-ft diameter tank that contained a heavy naphtha petroleum product. The analytical and experimental results of this project suggest that volumetric leak detection methods can be used to detect small leaks in aboveground storage tanks. Pages: 43

October 1991 | Product Number: J30600 | Price: $74.00

Publ 307
An Engineering Assessment of Acoustic Methods of Leak Detection in Aboveground Storage Tanks

Provides the results of a leak detection project in aboveground storage tanks that utilized acoustic methods to detect leaks. A series of field tests were conducted on a 114-ft diameter tank that contained a heavy naphtha petroleum product. The analytical and experimental results of this project suggest that passive-acoustic leak detection methods can be used to detect small leaks in aboveground storage tanks. Pages: 76

January 1992 | Product Number: J30700 | Price: $74.00

Publ 315
Assessment of Tankfield Dike Lining Materials and Methods

To assess tankfield materials and methods of containment, API commissioned a review of environmental regulations as well as a survey of candidate liner materials and installation methods to explore the technology base. The study was limited to diked areas surrounding storage tanks. Liner installations for secondary containment underneath tanks were excluded. Pages: 50

July 1993 | Product Number: J31500 | Price: $74.00

Publ 322
An Engineering Evaluation of Acoustic Methods of Leak Detection in Aboveground Storage Tanks

Describes a set of controlled experiments conducted on a 40-ft diameter refinery tank to determine the nature of acoustic leak signals and ambient noise under a range of test conditions. The features of a leak detection test needed for high performance are explored. The report concludes that accurate and reliable leak detection of aboveground storage tanks can be achieved through the use of acoustic methods. Pages: 80

January 1994 | Product Number: J32200 | Price: $74.00

Publ 323
An Engineering Evaluation of Volumetric Methods of Leak Detection in Aboveground Storage Tanks

Two volumetric approaches to detecting leaks from aboveground storage tanks—precision temperature sensors and mass measurement approaches—are evaluated in this report. A set of controlled experiments on a 117-ft diameter refinery tank is used to examine the effects of differential pressure on conventional level and temperature measurement systems. The features of a leak detection test needed for high performance are also explored. Pages: 86

January 1994 | Product Number: J32300 | Price: $74.00

Publ 325
An Evaluation of a Methodology for the Detection of Leaks in Aboveground Storage Tanks

Describes the results of the fourth phase of a program to define and advance the state of the art of leak detection for aboveground storage tanks (ASTs). Three leak detection technologies are examined—passive-acoustic, soil-vapor monitoring, and volumetric—over a wide range of tank types, petroleum fuels, and operational conditions. This study also assesses the applicability of a general leak detection methodology involving multiple tests and product levels as well as determines the integrity of 14 ASTs using two or more test methods. Pages: 94

May 1994 | Product Number: J32500 | Price: $90.00

Publ 327
Aboveground Storage Tank Standards: A Tutorial

Presents procedures and examples to help designers, owners, and operators of aboveground storage tanks understand and comply with API's recommended practices, standards, and specifications concerning leak prevention. These API documents provide requirements designed to minimize environmental hazards associated with spills and leaks. The tutorial also shows how the API inspection and maintenance requirements influence the design of such tanks. It does not attempt to address additional rules and requirements imposed by individual jurisdictions or states. Pages: 70

September 1994 | Product Number: J32700 | Price: $74.00

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

Publ 328
Laboratory Evaluation of Candidate Liners for Secondary Containment of Petroleum Products

Provides comparative data on the physical properties of liner materials as a function of their controlled exposure to fuels and/or additives. Six membrane and two clay liners were tested. Project test results were used to rank the liners in terms of vapor permeation and relative changes in properties such as chemical resistance and liquid conductivity measured after immersion. Pages: 142

January 1995 | Product Number: J32800 | Price: $83.00

Publ 334
A Guide to Leak Detection for Aboveground Storage Tanks

Written for terminal managers, tank owners, operators, and engineers, this report provides useful background on leak detection technologies—volumetric, acoustic, soil-vapor monitoring, and inventory control—for aboveground storage tanks. Characteristics affecting the performance of each technology are discussed. Pages: 38

September 1992 | Product Number: J33400 | Price: $74.00

Publ 340
Liquid Release Prevention and Detection Measures for Aboveground Storage Facilities

Written for managers, facility operators, regulators, and engineers involved in the design and selection of facility components and prevention of liquid petroleum releases, this report presents an overview of available equipment and procedures to prevent, detect, or provide environmental protection from such releases. Also presented are the advantages, disadvantages, and relative costs, as well as maintenance and operating parameters of various control measures. Pages: 116

October 1997 | Product Number: J34000 | Price: $83.00

Publ 341
A Survey of Diked-Area Liner Use at Aboveground Storage Tank Facilities

In 1997, API conducted a survey designed to evaluate the effectiveness of diked-area liner systems and to document operational problems involved with their use. The survey data indicated that the effectiveness of liners in protecting the environment is limited because liner systems frequently fail. The data further showed that there are few releases from aboveground storage tanks that would be addressed by diked-area liners. Because there were few releases, the data do not directly demonstrate the effectiveness or ineffectiveness of liner systems in containing releases; however, it was concluded that measures that prevent aboveground storage tank releases are more effective in protecting the environment and are more cost-effective in the long run. Pages: 32

February 1998 | Product Number: J34100 | Price: $74.00

Publ 346
Results of Range-Finding Testing of Leak Detection and Leak Location Technologies for Underground Pipelines

This study reviewed the current leak detection and leak location methods for pressurized underground piping commonly found at airports, refineries, and fuel terminals. Four methods for testing underground pipes of 6 in. to 18 in. in diameter and 250 ft to 2 miles in length were selected for field demonstration. These technologies were constant-pressure volumetric testing, pressure-decay testing, chemical tracer testing, and acoustic emission testing. No single leak detection system was found to work in all situations; site-specific conditions may affect any method, and combinations of methods may provide the most effective approach. Pages: 252

November 1998 | Product Number: J34600 | Price: $83.00

Publ 353
Managing Systems Integrity of Terminal and Tank Facilities

Although the risk management principles and concepts in this document are universally applicable, this publication is specifically targeted at integrity management of aboveground liquid petroleum storage facilities. The applicable petroleum terminal and tank facilities covered in this document are associated with distribution, transportation, and refining facilities as described in Std 2610 and Publ 340.

This document covers the issues of overall risk management, risk assessment, risk ranking, risk mitigation, and performance measures applicable to an overall integrity management program. The appendices include two possible methodologies for conducting a risk assessment and a workbook that can be used to perform the risk assessment method outlined in Appendix A. Pages: 316

1st Edition | October 2006 | Product Number: J35300 | Price: $146.00

Publ 4716
Buried Pressurized Piping Systems Leak Detection Guide

Analyzes of the performance of different types of leak detection technologies that were applied to buried pressurized piping systems used in airport hydrant fueling and petroleum product terminals. The study was conducted by Argus Consulting and Ken Wilcox Associates on behalf of the Air Transport Association of America and API. This report is intended to provide an overview of the study methodology and results. Pages: 47

April 2002 | Product Number: I47160 | Price: $94.00

Surface Water Research

DR 342
Toxicity Bioassays on Dispersed Oil in the North Sea: June 1996 Field Trials

The purpose of the study described in this report was to gain more information on water column impacts by taking advantage of the ongoing efficacy and monitoring studies done by the Norwegian Clean Seas Association for Operating Companies (NOFO) in order to conduct field toxicity tests.

The goal of this study was to obtain field effects data using shipboard, real-time toxicity tests with field water. These data can then be used in the future to link field effects to laboratory toxicity data. Pages: 108

June 2002 | Product Number: I34200 | Price: $139.00

DR 343
Automated Validation System for the Offshore Operations Committee Mud and Produced Water Discharge Model

Describes the development of an automated validation system for the Offshore Operators Committee Mud and Produced Water Discharge Model (the "OOC Model"), a computer program that predicts the initial fate of drilling fluids, drill cuttings, and produced water discharged into the marine environment. The system automates the process of validating OOC Model predictive capabilities by comparing model predictions with the results of laboratory and field studies of plume behavior. The system was developed to automate the laborious process of confirming that model code enhancements do not degrade the predictive abilities of the OOC Model. The automated validation system approach described here also serves as a template for routine documentation of discharge model performance that could be applied to other models used by industry, consultants, or regulatory agencies. Two of relevant studies found in a literature search were incorporated into the suite of automated test cases for the OOC Model. Summaries of the data sets used for OOC Model validation were prepared in such a way that they could be used conveniently outside of the automated system to validate of any relevant discharge model.

November 2002 | CD-ROM Only

Publ 4664
Mixing Zone Modeling and Dilution Analysis for Water-Quality-Based NPDES Permit Limits

This report is designed to

- provide an overview of the U.S. Environmental Protection Agency's (EPA) policies and technical guidance on the role of mixing zones in the National Pollutant Discharge Elimination System (NPDES) permitting process;
- present state mixing zone regulations, policies, and guidance;
- introduce important concepts related to the hydrodynamics of effluent dilution in receiving waters and the design of outfall diffusers;
- review available mixing zone models;
- identify EPA sources for the models;
- discuss strategic issues for dischargers to consider when applying models; and
- describe the use of dye tracer studies as alternatives or supplements to mixing zone models. Pages: 176

April 1998 | Product Number: I46640 | Price: $97.00

Publ 4672
The Use of Treatment Wetlands for Petroleum Industry Effluents

Treatment wetlands are becoming widely used for cleansing some classes of wastewater effluents. Although the use of treatment wetlands is well established for wastewater categories such as municipal waste, stormwater, agricultural wastewater, and acid mine drainage water, their use in treating a variety of industrial wastewaters is less well developed. Constructed treatment wetlands hold considerable promise for managing some wastewaters generated by the petroleum industry. Several large-scale wetland projects currently exist at oil refineries, and numerous pilot studies of constructed treatment wetlands have been conducted at terminals, gas and oil extraction and pumping stations, and refineries. This report summarizes current information about the use of treatment wetlands for managing petroleum industry wastewaters and also presents background information on the general performance, design, and operation of treatment wetlands based on experience with a variety of wastewater types. Pages: 222

October 1998 | Product Number: I46720 | Price: $97.00

Publ 4676
Arsenic: Chemistry, Fate, Toxicity, and Wastewater Treatment Options

Arsenic is a naturally occurring element in rocks, soils, water, sediments, and biological tissues. It is also present in fossil fuels. Arsenic in the environment has both anthropogenic and natural sources, and certain anthropogenic sources have caused localized adverse effects on ecological systems and human health. Based on extensive review of the literature, this monograph is intended to serve as a reference volume on the sources of arsenic in the environment, the chemistry and fate of arsenic compounds, biomedical effects, the toxicity of arsenic to aquatic and terrestrial species, wastewater treatment options, and regulatory standards for arsenic in the environment. Pages: 196

October 1998 | Product Number: I46760 | Price: $97.00

Publ 4688
Temporary Treatment Options for Petroleum Distribution Terminal Wastewaters

Provides guidance to terminal operators and engineers in evaluating mobile treatment systems for wastewater generated at petroleum distribution terminals. Some of the variables that must be considered include the characteristics of the wastewater, the permitting process, and contractor experience. This document provides sufficient information to guide an operator/engineer through evaluation of mobile treatment systems, including problem definition, treatment technology selection, contractor selection, and implementation. Pages: 73

November 1999 | Product Number: I46880 | Price: $122.00

Publ 4694
Laboratory Analysis of Petroleum Industry Wastewaters

Assists in arranging for and understanding laboratory analysis of petroleum industry wastewaters. Designed for environmental coordinators, managers, corporate staff, and others who must address environmental compliance reporting and regulatory issues. It is also useful for field personnel responsible for obtaining wastewater sample analyses to fulfill environmental regulatory requirements. Guidance and information are provided for setting data quality objectives; planning analyses; selecting a laboratory; and reviewing laboratory reports, detection and quantification limits, quality assurance/quality control practices, method references, method-defined analytes, and statistical calculations. Examples of case studies, laboratory reports, and data calculations are given throughout the manual. Checklists are provided to help users understand, plan, and review laboratory data. Pages: 175

December 1999 | Product Number: I46940 | Price: $122.00

Publ 4695
Understanding and Preparing Applications for Petroleum Facility NPDES Discharge Permits

Assists member companies and others in preparing applications and negotiating with permit authorities for National Pollutant Discharge Elimination System (NPDES) permits for wastewater discharges. The manual is intended to help permittees and permit applicants to understand the permit process from application to final permit and to provide tools and strategies for 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: $129.00

Publ 4698
A Review of Technologies to Measure the Oil and Grease Content of Produced Water from Offshore Oil and Gas Production Operations

Identifies and evaluates practical alternative methods for routine monitoring of oil and grease in produced waters. Traditional monitoring methods relied on Freon-113r extraction of oil and grease; however, owing to the phase-out of Freon-113r these methods can no longer be used, and new methods must be sought. This study evaluates two infrared detection methods and one fluorescence detection method for identifying and measuring oil and grease in produced waters. Performance information and the correlation of analytical results with the U.S. Environmental Protection Agency's hexane extraction method, Method 1664, are provided. Pages: 138

November 1999 | Product Number: I46980 | Price: $122.00

Publ 4717
Predictors of Water-Soluble Organics (WSOs) in Produced Water—A Literature Review

Reviews the scientific literature on the identity and physical/chemical characteristics of the WSOs in produced water in relation to characteristics of fossil fuels and their reservoirs. Pages: 24

March 2002 | Product Number: I47170 | Price: $74.00

Publ 4721
Analytical Detection and Quantification Limits: Survey of State and Federal Approaches

The purpose of this review was to determine the analytical detection and quantification limit policies of various state agencies. Of particular interest were policies for setting wastewater discharge permit limits at or below detection or quantification limits, for determining compliance with such limits, and for using alternative approaches to determining detection or quantification limits. Although the main focus of this review was on state policies involving water quality issues, included in the review were the policies of programs in other environmental areas as well as in federal regulations and statutes. Pages: 129

June 2002 | Product Number: I47210 | Price: $139.00

Publ 4736
Identification of Key Assumptions and Models for the Development of Total Maximum Daily Loads

Provides the reader with an understanding of the use of models in the development and implementation of total maximum daily loading (TMDL) studies.

The report focuses on the types of models used for TMDLs, the key assumptions underlying the models, how models are selected for specific surface waters and impairments, the data required to apply the models to a specific surface water and impairment, and how the predictive capability of the models is assessed. Pages: 64

November 2006 | Product Number: I47360 | Price: $149.00

Publ 4750
Cyanide Discharges in the Petroleum Industry: Sources and Analysis

Because both industrial and municipal dischargers have been issued National Pollutant Discharge Elimination System permits with low (5–20 µg/L) effluent limits for cyanide, there has been considerable interest in the reliability of the available test methods at these low concentrations. This report provides guidance on the measurement, as well as the presence and environmental fate, of cyanide compounds and related chemical species in petroleum industry wastewater effluents. Pages: 42

November 2008 | Product Number: I47500 | Price: $94.00

Publ 4751
Evaluation of Water Quality Translators for Mercury

Discusses the technical issues and constraints associated with translation of a mercury fish tissue concentration into a water quality criterion, in the use and implementation of the U.S. Environmental Protection Agency's fish-tissue-based criterion for methylmercury. The report focuses on available analytical methods for evaluating mercury in fish and water; proposed methods for translating a fish tissue concentration for mercury into a concentration in water; and implementation of the mercury criterion in the development of total maximum daily loads and water quality-based effluent limits. Pages: 37

1st Edition | December 2005 | Product Number: I47510 | Price: $70.00

Publ 4756
Interim Permitting Manual—Navigating NPDES Permit Issues on Impaired Waters

Addresses many water quality standards issues that facilities may encounter, including existing uses, use attainability analyses to revise designated uses, fish consumption advisories, whole effluent toxicity criteria, and sediment criteria. The manual will provide guidance on a number of listing issues, including listings due to violations of narrative criteria and fish consumption advisories, delisting, listing waters that are impaired but do not need a total maximum daily loading (TMDL) because they are expected to meet standards through other means, and challenging an erroneous listing determination.

The second part of this manual will discuss permitting discharges to impaired waters during the interim period before TMDLs are developed. The manual will describe the development of water quality-based effluent limitations on impaired waters and will also discuss a number of issues for affected facilities to consider during the permitting process, including timing (when the permit should be issued), watershed permitting, verifying the impairment determination before the permit is issued, other controls available to bring the water into attainment, reasonable potential calculations, voluntary reduction measures, nonnumeric effluent limitations, and calculating numeric effluent limitations. Pages: 41

November 2006 | Product Number: I47560 | Price: $76.00

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: $75.00

Publ 4783 ■
Water Management and Stewardship in Midstream, Downstream, and Delivery Operations in the Oil and Gas Industry

This report uses the oil and gas (petroleum) life cycle as an organizing framework for explanation and discussion. The scope of this study is focused on the midstream, downstream, and delivery components of the oil and gas life cycle. Upstream components of the life cycle will be addressed in a future report. This study is intended to inform stakeholders about how the oil and gas industry uses water in the midstream, downstream, and delivery phases of the petroleum life cycle and the various industry-led and regulatory practices employed to conserve and protect water resources. Pages: 46

December 2016 | Product Number: D47830 | Price: $75.00

BIOMONITORING

TR 402
Toxicity to Freshwater Alga, Selenastrum 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: $61.00

TR 406
TAME—Acute Toxicity to Daphnids Under Flow-Through Conditions

Describes the measurement of acute toxicity of tertiary amyl methyl ether (TAME) to daphnids under flow-through conditions. Nominal concentrations of TAME—690, 410, 250, 150, and 89 mg A.I./L—were maintained in exposure vessels and mean exposure concentrations calculated. Biological observations and physical characteristics were recorded at test initiation and at 3, 6, 24, and 48 hours. Pages: 76

February 1995 | Product Number: I00406 | Price: $61.00

TR 407
TAME—Acute Toxicity to Mysid Shrimp (Mysidopsis bahia) Under Static Renewal Conditions

Describes the measurement of acute toxicity of tertiary amyl methyl ether (TAME) to mysid shrimp under static renewal conditions. Nominal concentrations of TAME—1.6, 4.0, 7.3, 15, 30, and 60 mg A.I./L—were maintained by renewing solutions at 24, 48, and 72 hours of exposure. Observations were recorded at test initiation and every 24 hours until the test was terminated. Pages: 84

February 1995 | Product Number: I00407 | Price: $61.00

TR 408
TAME—Acute Toxicity to Rainbow Trout Under Flow-Through Conditions

Describes the measurement of acute toxicity of tertiary amyl methyl ether (TAME) to rainbow trout under flow-through conditions. During the test,

nominal concentrations of TAME—950, 570, 340, 210, and 120 mg A.I./L—were maintained and mean exposure concentrations calculated. Biological observations and physical characteristics were recorded at test initiation and every 24 hours thereafter until test termination. Pages: 80

February 1995 | Product Number: I00408 | Price: $62.00

Publ 4610

Critical Review of Draft EPA Guidance on Assessment and Control of Bioconcentratable Contaminants in Surface Waters

Reviews the U. S. Environmental Protection Agency's proposed methods and underlying assumptions for assessing bioconcentratable contaminants in petroleum industry effluents. It focuses on the effluent option and its application to National Pollutant Discharge Elimination System (NPDES)-permitted discharges from oil refineries, petroleum product marketing terminals, and oil/gas production platforms. The review also includes a general evaluation of the suitability of the tissue residue option for evaluating oil industry effluents. Pages: 134

January 1995 | Product Number: I46100 | Price: $70.00

Publ 4656

Bioaccumulation: How Chemicals Move from the Water into Fish and Other Aquatic Organisms

Provides an intermediate-level primer on the accumulation of chemicals by aquatic organisms with emphasis on polycyclic aromatic hydrocarbons. Key factors governing bioaccumulation are described to enhance understanding of this complex phenomenon. Approaches for assessing the bioaccumulation potential of chemicals are examined and an evaluation of each method's advantages and shortcomings is offered. Pages: 54

May 1997 | Product Number: I46560 | Price: $87.00

Publ 4666

The Toxicity of Common Ions to Freshwater and Marine Organisms

Whole effluent toxicity (WET) tests have become a common tool in the evaluation of effluent for discharge acceptability. Recent investigations have indicated that deficiencies or excesses of "common" ions (inorganic ions that are nearly always present in most aquatic systems at nontoxic concentrations) can cause significant acute or chronic toxicity in WET tests. This report presents the results of a review of toxicological and physiological data on inorganic ions that have been implicated in causing significant toxicity—bicarbonate, borate, bromide, calcium, chloride, fluoride, magnesium, potassium, strontium, and sulfate. Pages: 114

April 1999 | Product Number: I46660 | Price: $97.00

Publ 4701

Bioaccumulation: An Evaluation of Federal and State Regulatory Initiatives

August 2000 | Product Number: I47010 | Price: $88.00

EFFLUENTS: EXPLORATION AND PRODUCTION

DR 351

Proceedings: Workshop to Identify Promising Technologies for the Treatment of Produced Water Toxicity

Presents the discussions, conclusions and recommendations of an API workshop held in October 1994 to identify technologies that could potentially be used for the treatment of produced water toxicity offshore. Background information on the candidate technologies; information on produced water toxicity limitations, characteristics, and composition; results of toxicity identification evaluations; and a discussion of the engineering restrictions imposed by offshore platforms are included. Pages: 122

June 1996 | Product Number: I00351 | Price: $73.00

Publ 4611

Interlaboratory Study of EPA Methods 1662, 1654A and 1663 for the Determination of Diesel, Mineral and Crude Oils in Drilling Muds from Offshore and Gas Industry Discharges

Describes an interlaboratory round-robin study to validate the tiered approach of the U.S. Environmental Protection Agency's three methods—1662, 1654A, and 1663—for monitoring diesel oil in drilling muds. Various extraction methods were evaluated and analytical measurement techniques were tested for measuring diesel oil. Pages: 106

April 1995 | Product Number: I46110 | Price: $73.00

Publ 4633

Barium in Produced Water: Fate and Effects in the Marine Environment

Provides a summary of what is currently known about the physical and chemical behavior of barium in produced water and in the ocean. It discusses the factors that influence the rate of precipitation of barium as barite. The toxicity of barium to marine and freshwater organisms and humans is discussed in relation to the concentrations and forms in which it occurs in aquatic environments. Pages: 68

September 1995 | Product Number: I46330 | Price: $59.00

Publ 4641

Summary of Produced Water Toxicity Identification Evaluation Research

Summarizes the results of a three-part study to evaluate the ability of U.S. Environmental Protection Agency proposed toxicity identification evaluations (TIEs) to determine the potential toxicants in produced water from oil and gas production operations in various locations. Factors affecting the results of the TIEs were identified as well as potential toxicants. Suggestions for improving TIE procedures are included. Pages: 102

June 1996 | Product Number: I46410 | Price: $88.00

Publ 4702

Technologies to Reduce Oil and Grease Content of Well Treatment, Well Completion, and Workover Fluids for Overboard Disposal

Technologies to reduce oil and grease content of well treatment, well completion, and workover fluids for overboard disposal. Pages: 54

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

EFFLUENTS: MARKETING

Publ 4602

Minimization, Handling, Treatment and Disposal of Petroleum Products Terminal Wastewaters

Intended to be a basic guide and information resource for all wastewater operations at petroleum product terminals. It includes the regulatory framework for wastewater issues, a detailed description of the sources of terminal wastewater and associated contaminants as well as guidance on means for analyzing the wastewater situation at a terminal, for minimizing wastewater flow contamination, and for wastewater handling and disposal. Pages: 120

September 1994 | Product Number: I46020 | Price: $130.00

Publ 4665

Analysis and Reduction of Toxicity in Biologically Treated Petroleum Product Terminal Tank Bottoms Water

Objectives of this study were to measure toxicity in biologically treated petroleum product terminal tank bottoms waters, identify the chemical constituents causing that toxicity, identify treatment options, and measure the effectiveness of the treatment techniques in removing the constituents and reducing toxicity. Nine gasoline and two diesel tank bottoms water samples were collected from petroleum product terminals at various

geographical locations. The samples were normalized to a fixed chemical oxygen demand, then subjected to biological treatment. Treated samples were tested for acute toxicity in 24-hour exposure tests using Mysidopsis bahia and for chronic toxicity in 7-day static renewal toxicity tests also using Mysidopsis bahia. Biological treatment was observed to effectively remove metals but produced highly variable degrees of chemical oxygen demand, biochemical oxygen demand, and total organic carbon. Pages: 84

April 1998 | Product Number: I46650 | Price: $79.00

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: $97.00

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: $132.00

Publ 4700
Primer for Evaluating Ecological Risk at Petroleum Release Sites

Designed to help site and facility managers acting as site investigators decide how and to what extent to address ecological risks that may result from a release of petroleum products. The focus is on "downstream" operations related to transportation, distribution, or marketing of petroleum products, but the general principles may be adapted to other parts of the industry as well. The ecological risk assessment process is briefly described, and guidance is given about the preliminary investigation to assess the possible nature and extent of risk. This information is an initial part of a tiered decision-making process used to determine the depth and breadth of the site investigation. Pages: 52

May 2001 | Product Number: I47000 | Price: $103.00

EFFLUENTS: REFINING

DR 148
Identification of Organic 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: $61.00

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: $122.00

OIL SPILLS

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

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

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

DR 145
Identification of Oils that Produce Non-Buoyant In-Situ Burning Residues and Methods for Their Recovery

There is an environmental concern about the possibility of sinking residues from in-situ burns (ISBs), leading to the potential for damage to the aquatic bottom zone. The objective of the study presented in this publication was to start the process of establishing operational tools and procedures for dealing with such nonbuoyant burn residues. There were two tasks: develop protocols for identifying ISB residues likely to sink, and evaluate options for dealing with those residues in the field. Pages: 62

February 2002 | Product Number: IDR1450 | Price: $94.00

TR 425 ■
Options for Minimizing Environmental Impacts of Inland Spill Response

The purpose of this guide is to support contingency planners and emergency responders in evaluating response techniques and selecting those techniques that will most effectively prevent or minimize adverse environmental impacts from inland spills. In this guide, inland spills are defined as those that affect terrestrial and freshwater habitats, whereas coastal and marine spills affect water bodies and habitats that are under the

influence of tides and marine waters. Inland spills have unique characteristics and behavior, 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://oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/inland/options-for-minimizing-environmental-imp.pdf

TR 1149-3 ■
Canine Oil Detection: Field Trials Report

Field trials were undertaken in June 2015 to evaluate the applicability of canine oil detection teams (referred to as K9-SCAT) to support assessment surveys to locate and delineate the horizontal extent of subsurface oil for shoreline and inland spills response operations. The study is part of the American Petroleum Institute (API) Joint Industry Task Force (JITF) Shoreline Protection & Clean-Up Technical Working Group within the Oil Spill Preparedness and Response program. Pages: 59

June 2016 | Product Number: I114930 | For a free copy of this document, please visit www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/shoreline-protection/canine-oil-detection-field-trials-report.pdf

TR 1149-4 ■
Canine Oil Detection (K9-SCAT) Guidelines

The purpose of these Guidelines is to provide information on the potential for detection canines to support a shoreline or inland oiled area assessment (SCAT) program. This information includes how oil detection dogs use their sense of smell and what they can do to locate and delineate surface and subsurface oil, the current state of knowledge regarding situations and types of support surveys that a K9-SCAT team can undertake as part of a SCAT program, and how to plan and design a K9-SCAT survey and collect the appropriate data to document that mission. Pages: 81

July 2016 | Product Number: I114940 | For a free copy of this document, please visit www.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 www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/shoreline-protection/mechanical-treatment-of-sand-beaches-his.pdf

TR 1153-1 ■
Tidal Inlet Protection Strategies (TIPS): Phase 1—Final Report

This report presents an approach for the development of Tidal Inlet Protective Strategies (TIPS) that are based on knowledge of the physical systems involved and feasibility of tactical options. Strategies and tactics identified using the results of this study are subject to real-time conditions and pre-spill planned strategies should be re-evaluated during a response. The report considers potential tactics at a level appropriate for strategic planning, but is not intended to provide instructions for the implementation of those tactics. The guide is intended to be used by strategic planners and responders, and may be appropriate for inclusion in an Area Contingency Plan (ACP) or a Geographic Response Plan (GRP). Pages: 53

January 2014 | Product Number: I115310 | For a free copy of this document, please visit www.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 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 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 www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/inland/sunken-oil-ops-guide.pdf

TR 1155-1 ■
Shoreline In Situ Treatment (Sediment Mixing and Relocation) Library Report

The American Petroleum Institute (API) completed a study to improve the knowledge and understanding of shoreline sediment mixing and relocation techniques. The objective of the study is to provide the following tools: (1) Shoreline In Situ Treatment Library: an online library containing academic, scientific, technical, and operational literature, including links to electronic documents, where available; (2) Shoreline In Situ Treatment Fact Sheet: a non-academic educational guide, providing an overview of in situ treatment and Oil Particle Aggregate (OPA) formation for training and planning (TR 1154-2); and (3) Shoreline In Situ Treatment Job Aid: a non-academic operations tool for use during a response by Operations, the Environmental Unit (EU), and Shoreline Cleanup Assessment Technique (SCAT) teams for in situ treatment planning and operations, and to demonstrate to agencies how effectiveness and effects would be monitored (TR 1154-3). This report describes the first item of this program, the Shoreline In Situ Treatment Library, which is intended to locate and make available documents relevant

to shoreline in situ (sediment mixing and relocation) treatment techniques. The library is provided in simple MS Excel spreadsheet and MS Access database formats, which are described in this report. Pages: 5

June 2016 | Product Number: I115510 | For a free copy of this document, please visit www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/shoreline-protection/shoreline-in-situ-treatment-report.pdf

TR 1155-2 ■
Shoreline In Situ Treatment (Sediment Mixing and Relocation) Fact Sheet

This fact sheet explains the use of shoreline in situ techniques, including wet and dry mixing (also known as tilling or aeration) and sediment relocation (also known as surf washing or berm relocation) for oil spill cleanup. Burning is outside the scope of this fact sheet. Pages: 20

June 2016 | Product Number: I115520 | For a free copy of this document 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 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 www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/in-situ-burning/training-guide-for-isb-personnel.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 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: $87.00

Publ 4640
Petroleum in the Freshwater Environment: An Annotated Bibliography, 1946–1993

The growing concern for petroleum contamination in freshwater ecosystems led API to generate an annotated bibliography to serve as a valuable resource of existing literature on petroleum and its impact on the freshwater environment. It cites literature from 1946 through 1993 on the impact of petroleum products and oil spill cleanup agents on the biota of freshwater ecosystems, on the chemistry and fate of petroleum and cleanup agents in freshwater, and on the review of cleanup methods in freshwater systems. The electronic companion infobase has been prepared in two versions to enhance the value of the annotations: (1) the VIP editable version of the infobase allows the user to add new references, make personal annotations (e.g. bookmarks, notes, highlights, and pop-ups), and delete unwanted references, and (2) the standard noneditable version is read-only. Both versions are completely searchable; each word in the bibliography is indexed. Pages: 224

March 1997
(noneditable) Product Number: I46400 | Price: $60.00
(VIP editable) Product Number: I46401 | Price: $75.00

Publ 4649
The Use of Chemical Countermeasures Product Data for Oil Spill Planning and Response, Volumes I and II

Addresses many of the issues related to potential uses of chemical countermeasure products in mitigating the environmental impacts of spilled oil. Volume I summarizes workshop deliberations and presents consensus recommendations from the sessions on environmental effects, effectiveness, and decision making. Volume II contains 13 background papers for workshop participants on various scientific and operational topics, e.g. aquatic toxicity, oil weathering, and decision making. Pages: 380

April 1995 | Product Number: I46490 | Price: $57.00

Publ 4675
Fate and Environmental Effects of Oil Spills in Freshwater Environments

Provides basic information necessary for the formulation of spill response strategies that are tailored to the specific chemical, physical, and ecological constraints of a given spill situation. It summarizes environmental effects from inland oil spills into fresh surface waters. It provides technical information for persons responsible for inland spill response and cleanup, for researchers, and for others dealing with protection of the environment from possible oil spill hazards. This research identifies, describes, and compares the behavior, fate, and ecological implications of crude oil and petroleum products in inland waters. Pages: 160

December 1999 | Product Number: I46750 | Price: $142.00

Publ 4684
Compilation and Review of Data on the Environmental Effects of In-Situ Burning of Inland and Upland Oil Spills

Burning of spilled oil provides a relatively easy, low-cost cleanup method by reducing removal, transportation, and disposal costs as well as reducing the time required for cleanup. This study was commissioned by API to identify those environmental conditions under which burning should be considered as a response option for oil spilled in inland and upland habitats. This report presents a summary of the case histories and lessons learned from previous uses of burning in inland environments, with and without oil. While some information on human health and safety is included, the focus of this report is on the environmental fate and effects of in-situ burning. Pages: 198

March 1999 | Product Number: I46840 | Price: $117.00

Publ 4689
Chemical Human Health Hazards Associated with Oil Spill Response

Contains an overview of human health hazards that could be encountered by personnel involved with spills or leaks of petroleum products. The discussion includes potential risks of basic components and products of concern. Environmental factors that may affect exposure and a brief summary of other exposure considerations are also included. Pages: 51

August 2001 | Product Number: I14689 | Price: $83.00

Publ 4691
Fate of Spilled Oil in Marine Waters: Where Does It Go? What Does It Do? How Do Dispersants Affect It?

This is the first of three short summary publications commissioned for preparation by API for oil spill response decision-makers to provide concise easy-to-use information on understanding the fate of spilled oil and dispersants, their use, effectiveness, and effects. When making decisions regarding dispersant use, or any other oil spill response countermeasure, it is important to have a clear understanding of the overall fate of the oil entering the environment. With this publication you will receive a complete yet concise review of oil chemistry and oil weathering. Also provided is information on how to interpret dispersant information more effectively and how dispersants alter or affect the weathering processes of oil. Pages: 30

March 1999 | Product Number: I46910 | Price: Free*

Publ 4692
A Decision-Maker's Guide to Dispersants: A Review of the Theory and Operational Requirements

This is the second of three short summary publications commissioned for preparation by the API for oil spill response decision-makers to provide concise easy-to-use information on understanding the fate of spilled oil and dispersants, their use, effectiveness, and effects. This publication provides a summary of dispersant technology. It focuses on chemical dispersant technology and the information needs of decision-makers regarding the use of chemical dispersants and their potential benefits and risks. A reference that every oil spill response decision-maker must have! Pages: 52

March 1999 | Product Number: I46920 | Price: Free*

Publ 4693
Effects of Oil and Chemically Dispersed Oil in the Environment

Crude oil is a complex, highly variable mixture of hydrocarbons and other trace compounds, and exposure may cause a variety of adverse effects. Dispersants are mixtures of chemicals, solvents, and surfactants used to reduce oil viscosity and help the oil break up and disperse into the water column. This booklet is intended to help bridge the gap in understanding information about exposure and effects of untreated oil and chemically dispersed oil in the marine environment. Pages: 50

May 2001 | Product Number: I46930 | Price: Free*

Publ 4706
Environmental Considerations for Marine Oil Spill Response

API is offering a new revision of Environmental Considerations for Marine Oil Spill Response, generally known as the "Marine Manual." 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: $76.00

Publ 4724
Recovery of Four Oiled Wetlands Subjected to In-Situ Burning

Four sites, including a diversity of oil types burned and habitats, were selected for follow-up review and evaluation of the effects of in-situ burning (ISB): Mosquito Bay spill in Louisiana, burned in April 2001; Lakehead Pipe Line spill in Ruffy Brook, Minnesota, burned in July 2000; Louisiana Point pipeline spill, burned in February 2000; and Chevron Pipe Line Milepost 68 near Corinne, Utah, burned twice, in March and April 2000. Site visits were conducted in July (Minnesota and Utah) and October (two sites in Louisiana). All available data on each site were collected from those involved in the burns and the post-burn monitoring. State and local monitoring data provided additional information. The site was photographed from the same position and perspective as photographs taken during and shortly after the spill and burn, creating time-series photography as a visual record of the use of in-situ burning and vegetative recovery. In combination with quantitative field measurements, photography provides an excellent understanding of the specific site conditions and how the results might apply to other sites. Because this report includes a large number of color photographs for the sites, which would make traditional printing of hardcopy reports very expensive, the report is being published in digital format on CD-ROM.

June 2003 | Product Number: I47240 | Price: $85.00

Publ 4735
In-Situ Burning: The Fate of Burned Oil

The in-situ burn (ISB) is an oil spill response option that has been used far less frequently than mechanical countermeasures (booms, skimmers, etc.), and consequently, familiarity with ISB operations is limited. Decision-makers need a comprehensive understanding of the oil, how it acts in the environment, and aspects of the burn process in order to understand the behavior of any ISB by-products and the potential impacts from an in-situ burn. This document was designed to capture that knowledge and present it clearly and concisely so you will have the necessary information to understand issues associated with fate and effects of oil to which ISB has been applied. It is not a set of instructions for carrying out a specific ISB. Pages: 54

April 2004 | Product Number: I46350 | Price: Free*

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 www.api.org/environment-health-and-safety/clean-water/oil-spill-prevention-and-response/spills-and-releases.aspx

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: www.lindahall.org.

TR 91-001
Priority Topics for Research and Development in Oil Spill Response

TR 92-001
An Analysis of Historical Oil Spills and Current Cleanup Requirements to Aid in Selecting New Technologies for Spill Cleanup Operations

TR 92-002
Airborne Surveillance Technology Options for Improving Oil Spill Cleanup and Response

TR 92-003
Tenyo Maru Oil Spill (Remote Sensing Data Analysis)

TR 92-004
Oil Spill Detection Using Satellite-Based SAR

TR 92-006
Incorporation of State of the Art Technologies to Oil Spill Modeling

TR 93-001
Evaluation of Marine Post-Spill Sites for Long-Term Recovery Studies

TR 93-002.1
ROPME Sea Oil Spill Nearshore Geochemical Processes Study (Vol. 1)

TR 93-002.2
ROPME Sea Oil Spill Nearshore Geochemical Processes Study (Vol. 2) (Hydrocarbon Chemistry Analytical Results for Year One)

TR 93-002.3
ROPME Sea Oil Spill Nearshore Geochemical Processes Study (Vol. 3) (Remote Sensing Derived Habitat Classification and Error Evaluation for Year One)

TR 93-003.1
Interlaboratory Calibration Testing of Dispersant Effectiveness: Phase 1

TR 93-003.2
Interlaboratory Calibration Testing of Dispersant Effectiveness: Phase 2

TR 93-004
Oil Spill Detection: Documentation of Historical Remote Sensing Projects and Status

TR 93-006
MSRC Oil Spill Response Vessel Recovered Oil Systems Tests

TR 93-007
Occupational Health Implications of Crude Oil Exposure: Literature Review and Research Needs

TR 93-009.1
Aerial Dispersant Application: Assessment of Sampling Methods and Operational Altitudes, Vol. 1

TR 93-012
MSRC Workshop Report: Research on Worker Health & Safety

TR 93-013
MSRC Workshop Report: Research on Bioremediation of Marine Oil Spills

TR 93-014
MSRC Workshop Report: Research on the Ecological Effects of Dispersants and Dispersed Oil

TR 93-018
Formation and Breaking of Water-in-Oil Emulsions: Workshop Proceedings

TR 93-019
Mesocosm Test Facility Strawman Design

TR 93-023
Seminar on Software for Oil Spill Response and Contingency Planning

TR 93-024
Summary Report MSRC/IKU Flume Design Workshop

TR 93-026
Demulsification by Use of Heat and Emulsion Breaker

TR 93-027
Transfer of Crude Oil Weathering Technology

TR 93-028
Evaluation of a Toxicity Test Method Used for Dispersant Screening in California

TR 93-029
Technical Evaluation of the Coastal Oil Spill Simulation System Prototype

TR 93-030
Determination of Oil and Emulsions Viscosity and Interfacial Tension

TR 93-031
Recovered Oil and Oily Debris Handling to Facilitate Disposal

TR 93-032
Weathering Properties and Chemical Dispersibility of Crude Oils Transported in U.S. Waters

TR 94-001
In-Situ Burning of Water-in-Oil Emulsions

TR 94-003
Waterbird Deterrent Techniques

TR 94-004
A Review of the Methods and Ecological Consequences of Substrate Aeration for the Enhancement of Oil Bioremediation in Wetlands

TR 94-005
Coastal Oil Spill Simulation System Prototype Testing Program

TR 94-006
MSRC Workshop Report: Research on Waterbird Deterrents at Marine Oil Spills

TR 94-007
Phase 1: Oil Containment Boom at Sea Performance Test

TR 94-008
Rheological Correlation Studies on Water-in-Oil Emulsions

TR 94-010
Dispersed Oil and Dispersant Fate and Effects Research, California Program Results for 1993–94

TR 94-011
Toxicity Bioassays on Dispersed Oil in the North Sea: August 1994 Field Trials

TR 94-012
Demulsification by Use of Heat and Emulsion Breakers, Phase 2

TR 94-013
The Science, Technology and Effects of Controlled Burning of Oil Spills at Sea

TR 94-015
Comparison of Physically and Chemically Dispersed Crude Oil Toxicity Under Continuous and Spiked Exposure Scenarios

TR 94-018
Potential Use of the Microtox Assay as an Indicator of the Toxicity of Dispersed Oil

TR 94-019
Aerial Dispersant Application: Field Testing Research Program (Alpine, Texas)

TR 95-001
Phase 2: At Sea Towing Tests of Fire Resistant Oil Containment Booms

TR 95-002
Isolation and Identification of Compounds and Mixtures Which Promote and Stabilize Water-in-Oil Emulsions

TR 95-003
Phase 3: Oil Containment Boom at Sea Performance Tests

TR 95-004
Utility of Current Shoreline Cleaning Agent Tests in Field Testing

TR 95-005
An Analysis of Historical Opportunities for Dispersant and In-Situ Burning Use in the Coastal Waters of the United States Except Alaska

TR 95-007
Field Evaluation of Bioremediation in Fine Sediments

TR 95-010
Laboratory Studies of the Properties of In-Situ Burn Residues

TR 95-011
Formulation of New Fireproof Boom Designs

TR 95-012
Dispersed Oil and Dispersant Fate and Effects Research: California Program Results for 1994–1995

TR 95-014
The Effects of Oil and Chemically Dispersed Oil in Tropical Ecosystems: 10 Years of Monitoring Experimental Sites

TR 95-015
Reduction in the Toxicity of Crude Oil During Weathering on the Shore

TR 95-017
Mesoscale In-Situ Burn Aeration Test

TR 95-018
Proceedings of the Third Meeting of the Chemical Response to Oil Spills: Ecological Effects Research Forum

TR 95-019
A Mental Models Approach to Preparing Summary Reports on Ecological Issues Related to Dispersant Use

TR 95-020.1
Development of Protocols for Testing Cleaning Effectiveness and Toxicity of Shoreline Cleaning Agents (SCAs) in the Field

TR 95-020.2
Test Cleaning Effectiveness and Toxicity of Shoreline Cleaning Agents (SCAs): Data Report

TR 95-021
New Brunswick Bird Deterrent Study

TR 95-022
Proceedings of the Workshop on Technical Issues Related to Mesocsm Research in the Coastal Oil Spill Simulation System Facility

TR 95-024
Oil Weathering Study of the Morris J. Berman No. 6 Cargo Oil

TR 95-025
Oil Weathering Study of Arabian Light Crude Oil

TR 95-026
Oil Weathering Study of Maya Crude Oil

TR 95-027
Weathering Characterization of Heavy Fuels

TR 95-029
Dispersant Effectiveness: Phase 3

TR 95-030
Standard Method for Viscosity Measurement of Water-in-Oil Emulsions

TR 95-031
Toxicity Assessment of Oiled and Treated Sediments from and Experimental Bioremediation Site in Delaware Bay, USA

TR 95-033
Large Scale Testing of the Effect of Demulsifier Addition to Improve Oil Recovery Efficiency

TR 95-034
Evaluation of Oil Spill Cleanup Techniques in Coastal Environments

TR 95-038
Key Factors that Control the Efficiency of Oil Spill Mechanical Recovery Methods

BIENNIAL OIL SPILL CONFERENCE PROCEEDINGS

These conferences are sponsored by API, the U.S. Environmental Protection Agency, the U.S. Coast Guard, the International Petroleum Industry Environmental Conservation Association, and the International Maritime Organization. They address oil-spill prevention, behavior, effects, control, and cleanup.

Publ 4452
1987 Oil Spill Conference Proceedings
Product Number: I44520 | Price: $57.00

Publ 4479
1989 Oil Spill Conference Proceedings
Product Number: I44790 | Price: $57.00

Publ 4529
1991 Oil Spill Conference Proceedings
Product Number: I45290 | Price: $57.00

Publ 4575
Proceedings of the 1991 Oil Spill Conference Infobase

The Proceedings of the 1991 Oil Spill Conference are available on 3.5-in. or 5.25 in. computer diskette. More than 700 pages of proceedings, including hundreds of illustrations, can be loaded onto IBM or IBM-compatible personal computers. The minimum requirements of 512 KB RAM, hard disk drive, VGA monitor, and DOS 3.0 or higher, are listed in the reference manual that gives complete instructions for operating the infobase. A tutorial and glossary are included.
January 1993 | Product Number: I45751 | Price: $65.00

Publ 4580
1993 Oil Spill Conference Proceedings
Product Number: I45800 | Price: $59.00

Publ 4620
1995 Oil Spill Conference Proceedings
Product Number: I46200 | Price: $59.00

Publ 46201
1995 Abstracts to Oil Spill Conference Proceedings
Product Number: I46201 | Price: $59.00

Publ 4621
1995 Oil Spill Conference White Papers

Three white papers—(1) "Implementing an Effective Response Management System," (2) "The Use and Misuse of Science in Natural and Resource Damage Assessment," and (3) "Perspectives on Establishing and Maintaining Oil Pollution Capabilities"—were prepared for the 1995 Oil Spill Conference to address issues of varying scientific and sociopolitical importance to the oil spill community. During the 1995 conference, each white paper was the topic of a special panel session. Pages: 199
Product Number: I46210 | Price: $59.00

Publ 4651
1997 Oil Spill Conference Proceedings
April 1997 | Product Number: I46510 | Price: $59.00

Publ 4652
1997 Oil Spill Conference Issue Papers

Three issue papers—(1) "Putting Dispersants to Work: Overcoming Obstacles;" (2) "International Responsibilities: Are We Our Brothers' Keeper?;" and (3) "Differences in Risk Perception: How Clean is Clean?"—were prepared for the 1997 Oil Spill Conference to address issues of varying scientific and socio-political importance to the oil spill community. During the 1997 conference, each issue paper was the topic of a special panel session. Pages: 196
April 1997 | Product Number: I46520 | Price: $59.00

Publ 4675
Fate and Environmental Effects of Oil Spills in Freshwater Environments

Provides basic information necessary for the formulation of spill response strategies that are tailored to the specific chemical, physical, and ecological constraints of a given spill situation. It summarizes environmental effects from inland oil spills into fresh surface waters. It provides technical information for persons responsible for inland spill response and cleanup, for researchers, and for others dealing with protection of the environment from possible oil spill hazards. This research identifies, describes, and compares the behavior, fate, and ecological implications of crude oil and petroleum products in inland waters. Pages: 160
December 1999 | Product Number: I46750 | Price: $142.00

Publ 4684
Compilation and Review of Data on the Environmental Effects of In-Situ Burning of Inland and Upland Oil Spills

Burning of spilled oil provides a relatively easy, low-cost cleanup method by reducing removal, transportation, and disposal costs as well as reducing the time required for cleanup. This study was commissioned by API to identify those environmental conditions under which burning should be considered as a response option for oil spilled in inland and upland habitats. This report presents a summary of the case histories and lessons learned from previous uses of burning in inland environments, with and without oil. While some information on human health and safety is included, the focus of this report is on the environmental fate and effects of in-situ burning. Pages: 198
March 1999 | Product Number: I46840 | Price: $117.00

Publ 4686
1999 Oil Spill Conference Proceedings
1999 | CD-ROM Product Number: I4686A | Price: $59.00
Hard Copy Product Number: I4686B | Price: $59.00

Publ 4687
1999 International Oil Spill Conference Issue Papers

Two issue papers: (1) "Myths and Realities of Oil Spill Planning and Response: The Challenges of a Large Spill"—This paper reviews the myths and realities of spill preparedness and response—where improvements have occurred, which elements have been most or least effective, and where future investment should concentrate. Too many myths remain, and too few realities are understood; (2) "Judging Oil Spill Response Performance: The Challenge of Competing Perspectives"—This paper explores the roles of various participants and interested observers in a spill response and the criteria by which they judge it. Recommendations are offered to move toward a more systematic approach based on teamwork and guided by goals and performance criteria that have been accepted in advance by all stakeholders. These papers were prepared for the 1999 Oil Spill Conference to address issues of varying scientific and sociopolitical importance to the oil spill community. Pages: 106
January 1999 | Product Number: I46870 | Price: $59.00

Publ 4710
2003 Oil Spill Conference Proceedings
CD-ROM Product Number: I4701A | Price: $308.00
Hard Copy Product Number: I4701B | Price: $308.00

Publ 4718
2005 Oil Spill Conference Proceedings
CD-ROM Product Number: I47180A | Price: $308.00

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: $109.00

Publ 4608
User's Guide: Evaluation of Sediment Toxicity Tests for Biomonitoring Programs

Provides an introduction to sediment toxicity testing and presents to those unfamiliar with such testing how the resource manual (Publ 4607) can be used. The document contains descriptions of habitat type, sediment test systems, and biological endpoints. Site-specific concerns are identified to aid in test selection. Brief summaries of sampling and data analysis issues are also presented. Pages: 34

November 1994 | Product Number: I46080 | Price: $59.00

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: $61.00

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 www.api.org/environment-health-and-safety/environmental-performance/environmental-stewardship/waste-management-facilities.aspx

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: $136.00

Publ 351
Overview of Soil Permeability Test Methods

The determination of soil permeability is one of the most important items in assessing aboveground storage tank facilities' secondary containment areas. This publication outlines various methods to test the permeability of soil and distinguishes between laboratory and field methods, though it does not supply an exhaustive list of all available permeability methods. These methods are identified according to their applicability to particular soil types. The methods presented in this report are applicable to fine-grained soils (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: $90.00

Publ 4465
Evaluation of the Treatment Technologies for Listed Petroleum Refinery Wastes

Evaluated the efficacy of five treatment methods, alone and in combination, for listed petroleum refinery wastes: mechanical treatment (filtration), solvent extraction, thermal treatment (drying), chemical fixation, and pyrolysis. The use of all the methods resulted in wastes of substantially reduced hazard, as measured by total and leachable concentration of residues in the product solid. Pages: 200

December 1987 | Product Number: I44650 | Price: $70.00

Publ 4527
Evaluation of Limiting Constituents Suggested for Land Disposal of Exploration and Production Wastes

Describes a study to develop salinity and petroleum hydrocarbon threshold guidance values that typically should not be exceeded for one-time land application of exploration and production wastes. Definition, technical justification, and guidance for application of threshold values are provided. Measurable parameters that serve as indices for proper environmental management of salinity and petroleum hydrocarbons include: electrical conductivity, sodium adsorption ratio and exchangeable sodium percentage for salinity, and oil and grease for petroleum hydrocarbons. Pages: 66

August 1993 | Product Number: I45270 | Price: $61.00

Publ 4600
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: $59.00

Publ 4618
Characteristics and Performance of Supercritical Fluid Extraction (SFE) in the Analysis of Petroleum Hydrocarbons in Soils and Sludges

Summarizes the results of a study to evaluate and improve SFE methods and instrumentation for analytical-scale extractions of petroleum hydrocarbons from soils and sludges. The study determines which types of samples and waste are best suited for analysis by SFE and optimal conditions for complete extraction. Pages: 24

May 1995 | Product Number: I46180 | Price: $59.00

Publ 4663
Remediation of Salt-Affected Soils at Oil and Gas Production Facilities

Water separated from oil and gas during production contains dissolved solids, including salt. If improperly handled, produced water with sufficient salt concentrations can damage plants and soils. Therefore, this manual was designed to assist the oil and gas environmental professional and field personnel to (1) assess sites with salt-affected soils; (2) evaluate remedial alternatives; and (3) conduct remedial activities, if necessary. It provides forms for organizing assessment information and conducting sample collection and analysis. Remediation options are divided into three primary groupings: natural remediation, in-situ chemical amendment remediation, and mechanical remediation. A decision tree and worksheets are provided to aid in the selection of a remedial option(s). Technical approaches for applying each group of remedial options are discussed. A number of appendices provide supplementary information on various aspects of salt-affected soil remediation.

October 1997 | Product Number: I46630 | Price: $110.00

Publ 4733
Risk-Based Screening Levels for the Protection of Livestock Exposed to Petroleum Hydrocarbons

The purpose of this study was to develop toxicity values and screening guidelines for evaluating risks to livestock from exposure to petroleum hydrocarbons. This report addresses how to determine whether livestock should be included in a risk evaluation, and estimate risks of petroleum hydrocarbon exposures to livestock. Pages: 50

July 2004 | Product Number: I47330 | Price: $92.00

Publ 4734
Modeling Study of Produced Water Release Scenarios

Provides a scientific basis for operators, regulators and landowners to determine if assessment or remediation of produced water releases will provide a meaningful environmental benefit. Pages: 124

January 2005 | Product Number: I47340 | Price: $123.00

Publ 4758
Strategies for Addressing Salt Impacts of Produced Water Releases to Plants, Soil, and Groundwater

The exploration and production industry uses great care during the handling and disposal of the produced water that is generated as part of oil and gas production. However, unintentional releases can occur. Depending on the chemical composition of the produced water and the nature of the local environment, salts associated with such releases can impair soils, vegetation, and water resources.

Provides a collection of simple rules of thumb, decision charts, models, and summary information from more detailed guidance manuals to help you address the following assessment and response issues:

- Will a produced water release cause an unacceptable impact on soils, plants, and/or groundwater?
- In the event of such an impact, what response actions are appropriate and effective? Pages: 29

1st Edition | September 2006 | Product Number: I47580 | Price: $70.00

Data Products

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Your Portal for Petroleum Statistics and Information
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Nowadays, the oil and natural gas industry moves, quite literally, at the speed of light. Information races around the globe in the blink of an eye. Facts and figures fly back and forth, and if you are in the right place at the right time, you get the information you need.

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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 www.api.org/data.

Monthly Statistical Report

Contains timely interpretation and analysis of recent developments on major products' production, imports, refinery operations, and inventories. This report includes API's estimates of these data for the most recent month and graphs of major series, including product deliveries, crude oil production, imports, refinery activity, and inventories for the past 24 months.

In addition, the December issue, published in mid-January, presents year-end supply/demand estimates and summarizes developments of the year. Quarterly estimates are also included 4 times per year. API's Monthly Statistical Report is published 2 to 3 weeks following the end of the month.

Single Subscriber
Product Number: T00002 | Price: $3,300.00

Imports and Exports of Crude Oil and Petroleum Products (12 Issues)

Published monthly by the API, the imports report contains detailed company level data on the imports of crude oil and petroleum products. Details include: record on importer, port of entry, country of origin, recipient, destination, quantity and API gravity (except residual fuel oil), and sulfur content (for crude oil and residual fuel oil).

The imports report is based on reports published by the U.S. Department of Energy's Energy Information Administration; however, it is presented in a more user friendly and easier reporting layout. The report is available by the second week of each month, containing data from 2 months earlier (e.g. August imports report is published around the second week of October). Historical data are also available in electronic format.

Single Subscriber
Product Number: T00050 | Price: $12,400.00

Inventories of Natural Gas Liquids and Liquefied Refinery Gases

Presents data on the inventory levels of ethane, propane, isobutane, normal butane, and pentanes plus. These inventories, located at natural gas plants, at refineries, at bulk terminals, and in underground storage, are grouped into eight regional areas. The report is issued at the end of each month, containing data from the prior month (e.g. August report is published at the end of September).

Single Subscriber
Product Number: T00004 | Price: $4,200.00

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: $3,100.00

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.

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(2014 Data) Product Number: N62817 | Price: $400.00

Joint Association Survey on Drilling Costs (JAS)

The JAS is an annual survey, published in December, that contains the only long-term source of information of detailed U.S. drilling expenditures on wells, footage, and related expenditures in the United States. An Analysis & Trends section provides detailed information and graphs about offshore and onshore wells, shale wells, coalbed methane wells, and sidetrack wells. The data presented in the U.S. Summary Tables section are broken down by well type (oil wells, gas wells, and dry holes) and by depth interval. Additionally, the data in these tables are disaggregated by well class (exploratory wells and development wells) and offshore and onshore production.

Single Subscriber
(2014 Data) Product Number: T00007 | Price: $3,100.00

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: $4,900.00
Hard Copy (2 Issues Only) Product Number: 05400 | Price: $1,700.00

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DISCUSSION PAPERS

DP 074
Current Status of Watershed Management in the United States

To understand the current status of watershed programs, this paper reviews watershed approaches of individual watershed programs and institutions. Each case study also discusses, in a general manner, the impact on petroleum industry activity within the watershed. Background information is also provided on the Clean Water Act, the nonpoint source pollution problem in the United States, and the current emphasis on watershed management approaches.

November 1993

DP 077
Alternative Wetland Mitigation Programs

The Corps of Engineers and EPA have issued memoranda of agreement and guidance that restrict the petroleum industry's ability to explore for and produce oil and natural gas in wetlands. In particular, federal agency rules require wetland mitigation banks—that could be used to compensate for possible wetland losses—to be fully functional before industry can use them. However, state and local governments often allow for concurrent and in lieu fee banking arrangements; these allow for payments to a group or agency that will undertake wetland restoration or preservation in lieu of managing such activities directly. This study examines those programs, their relationship to the federal permitting process, how they assure mitigation is successful, and how they achieve no overall net loss of wetlands.

February 1995

DP 081
Are We Running Out of Oil?

Since the dawn of the petroleum industry in the mid-19th century, there have been recurrent waves of concern that exhaustion of the world's petroleum resource base was imminent. This study examines carefully both the historical record and the most prominent recent geological assessments. The analysis shows that the obvious concern—that of imminent exhaustion of world oil resources—is actually the most easily dismissed. Nature continues to be quite generous in providing oil resources for development. However, there is a danger that attempts by government to address the non-problem of resource exhaustion will distract from or even aggravate the challenge of removing institutional barriers to supply development.

December 1995

DP 084R
Analysis of the Costs and Benefits of Regulations: Review of Historical Experience

Recent legislative proposals to reform the regulatory process have included the use of benefit cost analysis to decide whether or not a regulation should be implemented. The purpose of this paper is to assess the current practices of benefit cost analysis, primarily through examination of the series of regulatory impact analyses mandated by presidential executive orders. While the record is mixed, it shows that in many, but perhaps not all, cases it is possible to develop a reasonable estimate of the benefits and costs of proposed regulations and to decide among regulatory alternatives on the basis of these analyses.

December 1996

DP 086
Opposition to OCS Development, Historical Context and Economic Considerations

This paper reviews the history of offshore leasing, focusing on the long conflict between the federal government and the states over control of the leasing process. The paper then examines economic aspects of leasing and relates these to the controversy surrounding leasing. The conclusions of the analysis suggest that consideration should be given to sharing a portion of federal offshore revenues with affected coastal communities. This sharing has the potential to reduce opposition to offshore leasing and allow the nation to realize more of the net benefits from tapping offshore oil and natural gas resources.

November 1996

DP 088
Restoring Natural Resources: Legal Background and Economic Analysis

This paper reviews the legislative and legal history behind the resource damage restoration regulations under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Oil Pollution Act (OPA). The damage restoration debate is whether the objective is to restore a natural resource's lost services or whether to restore the exact chemical, biological, and physical characteristics. This paper reviews the debate over these approaches to restoration and the economic implications of adopting one approach over another. This paper supports a services approach and suggests modifications to the current interpretation of restoration requirements.

October 1997

RESEARCH STUDIES

RS 032
An Empirical Analysis of the Determinants of Petroleum Drilling

December 1983

RS 051
The Use of Economic Incentive Mechanisms in Environmental Management

June 1990

RS 053
Reducing Emissions from Older Vehicles

August 1990

RS 056
Economics of Alternative Fuel Use: Compressed Natural Gas as a Vehicle Fuel

December 1990

RS 064
U.S. Petroleum Supply: History, Prospects, and Policy Implications

September 1992

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
www.springer.com/economics/industrial+organization/book/978-0-7923-9685-7?otherVersion=978-94-010-7305-9

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Policy Analysis Department
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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.

There's a Lot of Life in Oil and Natural Gas

This brochure describes the importance of oil and natural gas in our daily lives. Lists the fuels, products, and other essential items vital to maintaining our quality of life.

Also available online: http://www.api.org/~/media/Files/Oil-and-Natural-Gas/Classroom/LifeInOilandNaturalGas.pdf

To order, contact the API Communications Department: (202) 682-8062

Energizing Life
The Story of Oil and Natural Gas

This website will take you on an interactive journey through each part of the extraordinary story of oil and natural gas.

View online: http://www.api.org/story/index.html

In case of questions, contact the API Communications Department: (202) 682-8062

DVD

Fuel-Less, You Can't Be Cool Without Fuel

A 17-minute educational and entertaining DVD film for teen students that uses pop music and dance to illustrate the often invisible role petroleum products play in our lives. It shows how oil is transformed into products such as gasoline, jet fuel, cosmetics, clothing, CDs, and even aspirin. The film, designed for a middle-school audience, was produced by Emmy award-winning journalist Ellen Kingsley with a cast that includes a real science teacher and several teens.

September 1996 | Price: No charge for first five single copies

To order, contact the API Communications Department: (202) 682-8062

CHINESE *

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

Chinese translation of Spec Q1.

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

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

Chinese translation of Spec Q2.

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

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

Chinese translation of Spec 2B.

6th Edition | July 2001 | Product Number: G02B06C | Price: $59.00

Spec 2C
Offshore Pedestal-Mounted Cranes—Chinese

Chinese translation of Spec 2C.

7th Edition | March 2012 | Product Number: G02C07C | Price: $101.00

Spec 2F
Specification for Mooring Chain—Chinese

Chinese translation of Spec 2F.

6th Edition | June 1997 | Product Number: G02F06C | Price: $63.00

Spec 4F
Specification for Drilling and Well Servicing Structures—Chinese

Chinese translation of Spec 4F.

4th Edition | January 2013 | Product Number: G04F04C | Price: $81.00

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

Chinese translation of RP 4G.

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

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

Chinese translation of RP 5A5.

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

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

Chinese translation of Spec 5B.

15th Edition | April 2008 | Product Number: G05B15C | Price: $83.00

Spec 5CT
Specification for Casing and Tubing—Chinese

Chinese translation of Spec 5CT.

9th Edition | July 2011 | Product Number: G5CT09C | Price: $166.00

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

Chinese translation of RP 5C1.

18th Edition | May 1999 | Product Number: G05C18C | Price: $81.00

RP 5C6
Welding Connections to Pipe—Chinese

Chinese translation of RP 5C6.

2nd Edition | March 2006 | Product Number: G05C62C | Price: $61.00

Spec 5DP/ISO 11961:2008
Specification for Drill Pipe—Chinese

Chinese translation of Spec 5DP.

1st Edition | August 2009 | Product Number: GX5DP01C | Price: $127.00

Spec 5L
Specification for Line Pipe—Chinese

Chinese translation of Spec 5L.

45th Edition | December 2012
Product Number: G05L45C | Price: $181.00

Spec 5LCP
Specification on Coiled Line Pipe—Chinese

Chinese translation of Spec 5LCP.

2nd Edition | October 2006 | Product Number: G5LCP2C | Price: $103.00

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

Chinese translation of RP 5LT.

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

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

Chinese translation of RP 5L2.

4th Edition | July 2002 | Product Number: G5L204C | Price: $59.00

Spec 5ST
Specification for Coiled Tubing—U.S. Customary and SI Units—Chinese

Chinese translation of Spec 5ST.

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

Spec 6A/ISO 10423:2009
Specification for Wellhead and Christmas Tree Equipment—Chinese

Chinese translation of Spec 6A.

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

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Specification for Pipeline and Piping Valves—Chinese
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24th Edition | August 2014 | Product Number: G6D024C | Price: $105.00

Spec 6DSS/ISO 14723:2009
Specification for Subsea Pipeline Valves—Chinese
Chinese translation of Spec 6DSS.
2nd Edition | December 2009
Product Number: GX6DSS2C | Price: $116.00

Spec 7-1/ISO 10424-1:2004
Specification for Rotary Drill Stem Elements—Chinese
Chinese translation of Spec 7-1.
1st Edition | February 2006 | Product Number: GX7101C | Price: $114.00

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

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

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

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

Spec 10D/ISO 10427-1:2001
Specification for Bow-Spring Casing Centralizers—Chinese
Chinese translation of Spec 10D.
6th Edition | March 2002 | Product Number: GX10D06C | Price: $63.00

Spec 11B
Specification for Sucker Rods, Polished Rods and Liners, Couplings, Sinker Bars, Polished Rod Clamps, Stuffing Boxes, and Pumping Tees—Chinese
Chinese translation of Spec 11B.
27th Edition | May 2010 | Product Number: G11B27C | Price: $109.00

RP 11BR
Recommended Practice for the Care and Handling of Sucker Rods—Chinese
Chinese translation of RP 11BR.
9th Edition | August 2008 | Product Number: G11BR09C | Price: $74.00

Spec 11E
Specification for Pumping Units—Chinese
Chinese translation of Spec 11E.
19th Edition | November 2013
Product Number: G11E019C | Price: $119.00

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: $61.00

Spec 12D
Specification for Field Welded Tanks for Storage of Production Liquids—Chinese
Chinese translation of Spec 12D.
11th Edition | October 2008 | Product Number: G12D11C | Price: $68.00

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

Spec 12J
Specification for Oil and Gas Separators—Chinese
Chinese translation of Spec 12J.
8th Edition | October 2008 | Product Number: G12J08C | Price: $68.00

Spec 12K
Specification for Indirect Type Oilfield Heaters—Chinese
Chinese translation of Spec 12K.
8th Edition | October 2008 | Product Number: G12K08C | Price: $81.00

Spec 13A/ISO 13500:2009
Specification for Drilling Fluid Materials—Chinese
Chinese translation of Spec 13A.
18th Edition | February 2010 | Product Number: GX13A018C | Price: $127.00

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

Spec 14L/ISO 16070:2005
Specification for Lock Mandrels and Landing Nipples—Chinese
Chinese translation of Spec 14L.
2nd Edition | July 2007 | Product Number: GX14L02C | Price: $84.00

Spec 15LE
Specification for Polyethylene Line Pipe (PE)—Chinese
Chinese translation of Spec 15LE.
4th Edition | January 2008 | Product Number: G15LE4C | Price: $71.00

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Spec 15LR
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7th Edition | August 2001 | Product Number: G15LR7C | Price: $68.00

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

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

Spec 16R
Specification for Marine Drilling Riser Couplings—Chinese
(replaces API RP 2R)
Chinese translation of Spec 16R.
1st Edition | January 1997 | Product Number: G16R01C | Price: $68.00

Spec 17D/ISO 13628-4
Design and Operation of Subsea Production Systems—Subsea Wellhead and Tree Equipment—Chinese
Chinese translation of Spec 17D.
2nd Edition | May 2011 | Product Number: GX17D02C | Price: $131.00

RP 19B
Evaluation of Well Perforators—Chinese
(formerly RP 43)
Chinese translation of RP 19B.
2nd Edition | September 2006 | Product Number: G019B2C | Price: $86.00

Spec 19G1/ISO 17078-1:2004
Side-Pocket Mandrels—Chinese
Chinese translation of Spec 19G1
1st Edition | May 2010 | Product Number: GG19G101C | Price: $73.00

RP 75
Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities—Chinese
Chinese translation of RP 75.
3rd Edition | May 2004 | Product Number: G07503C | Price: $63.00

API 510
Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration—Chinese
Chinese translation of API 510.
10th Edition | May 2014 | Product Number: C51010C | Price: $158.00

Std 537/ISO 25457:2008
Flare Details for General Refinery and Petrochemical Service—Chinese
Chinese translation of Std 537.
2nd Edition | December 2008
Product Number: C53702C | Price: $152.00

RP 571
Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Chinese
Chinese translation of RP 571.
2nd Edition | April 2011 | Product Number: C57102C | Price: $231.00

RP 575
Inspection Practices for Atmospheric and Low-Pressure Storage Tanks—Chinese
Chinese translation of RP 575.
3rd Edition | April 2014 | Product Number: C57503C | Price: $133.00

RP 576
Inspection of Pressure-Relieving Devices—Chinese
Chinese translation of RP 576.
3rd Edition | November 2009 | Product Number: C57603C | Price: $94.00

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Chinese translation of RP 577.
2nd Edition | December 2013
Product Number: C57702 CN1420 | Price: $158.00

RP 578
Material Verification Program for New and Existing Alloy Piping Systems—Chinese
Chinese translation of RP 578.
2nd Edition | March 2010 | Product Number: C57802C | Price: $91.00

Std 600
Steel Gate Valves—Flanged and Butt-Welding Ends, Bolted Bonnets—Chinese
Chinese translation of Std 600.
13th Edition | January 2015 | Product Number: C60013C | Price: $95.00

Std 608
Metal Ball Valves—Flanged, Threaded, and Welding Ends—Chinese
Chinese translation of Std 608.
5th Edition | November 2012 | Product Number: C60805C | Price: $77.00

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Design and Construction of Large, Welded, Low-Pressure Storage Tanks—Chinese
Chinese translation of Std 620.
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Std 650
Welded Tanks for Oil Storage—Chinese
Chinese translation of Std 650.
12th Edition | March 2013 | Product Number: C65012C | Price: $333.00

RP 651
Cathodic Protection of Aboveground Petroleum Storage Tanks—Chinese
Chinese translation of RP 651.
4th Edition | September 2014 | Product Number: C65104C | Price: $88.00

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Tank Inspection, Repair, Alteration, and Reconstruction—Chinese
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5th Edition | November 2014 | Product Number: C65305C | Price: $165.00

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Positive Displacement Pumps—Rotary—Chinese
Chinese translation of Std 676.
3rd Edition | November 2009
Product Number: C67603 CN945 | Price: $105.00

Std 682
Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps—Chinese
Chinese translation of Std 682.
4th Edition | May 2014 | Product Number: C68204C | Price: $179.00

Std 2220
Contractor Safety Performance Process—Chinese
Chinese translation of Std 2220.
3rd Edition | October 2011 | Product Number: K222003C | Price: $64.00

KAZAKH *

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

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

RP 5L2
Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service—Kazakh
Kazakh translation of RP 5L2.
4th Edition | July 2002 | Product Number: G5L204K | Price: $67.00

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

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

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

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Cement Sheath Evaluation—Kazakh
Kazakh translation of TR 10TR1.
2nd Edition | September 2008
Product Number: G10TR12K | Price: $116.00

TR 10TR4
Selection of Centralizers for Primary Cementing Operations—Kazakh
Kazakh translation of TR 10TR4.
1st Edition | May 2008 | Product Number: G10TR40K | Price: $49.00

TR 10TR5
Methods for Testing of Solid and Rigid Centralizers—Kazakh
Kazakh translation of TR 10TR5.
1st Edition | May 2008 | Product Number: G10TR50K | Price: $49.00

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Kazakh translation of RP 13D.
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Recommended Practice for Chemical Analysis of Barite—Kazakh
Kazakh translation of RP 13K.
3rd Edition | May 2011 | Product Number: G13K03K | Price: $86.00

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

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Recommended Practice for Evaluation of Well Perforators—Kazakh (formerly RP 43)
Kazakh translation of RP 19B.
2nd Edition | September 2006
Product Number: G019B2K | Price: $98.00

RP 49
Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide—Kazakh
Kazakh translation of RP 49.
3rd Edition | May 2001 | Product Number: G4903K | Price: $71.00

Std 53
Blowout Prevention Equipment Systems for Drilling Wells—Kazakh
Kazakh translation of Std 53.
4th Edition | November 2012 | Product Number: G05304K | Price: $124.00

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

Kazakh translation of RP 54.

3rd Edition | August 1999 | Product Number: G54003K | Price: $100.00

RP 59
Recommended Practice for Well Control Operations—Kazakh

Kazakh translation of RP 59.

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

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

Kazakh translation of RP 64.

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

RP 65
Cementing Shallow Water Flow Zones in Deepwater Wells—Kazakh

Kazakh translation of RP 65.

1st Edition | September 2002 | Product Number: G56001K | Price: $97.00

RP 67
Recommended Practice for Oilfield Explosives Safety—Kazakh

Kazakh translation of RP 67.

2nd Edition | May 2007 | Product Number: G09308K | Price: $68.00

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Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2—Kazakh

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Welding of Pipelines and Related Facilities—Kazakh

Kazakh translation of Std 1104.

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

Portuguese translation of Spec Q1.

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

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

Portuguese translation of Spec Q2.

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

Spec 5CT
Specification for Casing and Tubing—Portuguese

Portuguese translation of Spec 5CT.

9th Edition | July 2011 | Product Number: G5CT09P | Price: $237.00

Spec 5L
Specification for Line Pipe—Portuguese

Portuguese translation of Spec 5L.

45th Edition | December 2012
Product Number: G05L45P | Price: $258.00

Std 1104
Welding of Pipelines and Related Facilities—Portuguese

Portuguese translation of Std 1104.

21st Edition | September 2013
Product Number: D110421P | Price: $345.00

RUSSIAN *

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

Russian translation of Spec Q1.

9th Edition | June 2013 | Product Number: G0Q109R | Price: $96.00

Spec Q2
Specification for Quality Management System Requirements for Service Supply Organization for the Petroleum and Natural Gas Industries—Russian

Russian translation of Spec Q2.

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

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

Russian translation of Spec 2W.

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

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

Russian translation of Spec 5B.

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

RP 5B1
Gauging and Inspection of Casing, Tubing and Pipe Line Threads—Russian

Russian translation of RP 5B1.

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

Spec 5CT
Specification for Casing and Tubing—Russian

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45th Edition | December 2012
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RP 5L2
Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service—Russian

Russian translation of RP 5L2.

4th Edition | July 2002 | Product Number: G5L204R | Price: $67.00

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

Russian translation of RP 5L7.

2nd Edition | June 1988 | Product Number: G02906R | Price: $72.00

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

Russian translation of RP 5L8.

2nd Edition | December 1996
Product Number: G05L82R | Price: $100.00

RP 5L9
External Fusion Bonded Epoxy Coating of Line Pipe—Russian

Russian translation of RP 5L9.

1st Edition | December 2001 | Product Number: G5L901R | Price: $64.00

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

Russian translation of Spec 6AV1.

2nd Edition | February 2013 | Product Number: G6AV102R | Price: $64.00

Spec 6D
Specification for Pipeline and Piping Valves—Russian

Russian translation of Spec 6D.

24th Edition | August 2014 | Product Number: G6D024R | Price: $120.00

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

Russian translation of Spec RP 6DR.

2nd Edition | May 2012 | Product Number: G06DR2R | Price: $63.00

Spec 6FA
Specification for Fire Test for Valves—Russian

Russian translation of Spec 6FA.

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

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

Russian translation of Spec 6FD.

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

RP 7G
Recommended Practice for Drill Stem Design and Operating Limits—Russian

Russian translation of RP 7G.

16th Edition | September 2009
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TR 10TR1
Cement Sheath Evaluation—Russian

Russian translation of TR 10TR1.

2nd Edition | September 2008
Product Number: G10TR12R | Price: $116.00

TR 10TR2
Shrinkage and Expansion in Oilwell Cements—Russian

Russian translation of TR 10TR2.

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

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

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

Russian translation of TR 10TR4.

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

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Methods for Testing of Solid and Rigid Centralizers—Russian

Russian translation of TR 10TR5.

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RP 11S2
Recommended Practice for Electric Submersible Pump Testing—Russian

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RP 11S3
Recommended Practice for Electrical Submersible Pump Installations—Russian

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Russian translation of Spec 12J.

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

RP 19B
Recommended Practices for Evaluation of Well Perforators—Russian
Russian translation of RP 19B.
2nd Edition | September 2006
Product Number: G019B2R | Price: $97.00

RP 49
Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide—Russian
Russian translation of RP 49.
3rd Edition | May 2001 | Product Number: G04903R | Price: $68.00

RP 54
Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations—Russian
Russian translation of RP 54.
3rd Edition | August 1999 | Product Number: G54003R | Price: $100.00

RP 59
Recommended Practice for Well Control Operations—Russian
Russian translation of RP 59.
2nd Edition | May 2006 | Product Number: G59002R | Price: $97.00

RP 64
Recommended Practice for Diverter Systems Equipment and Operations—Russian
Russian translation of RP 64.
2nd Edition | November 2001 | Product Number: G64002R | Price: $85.00

RP 65
Cementing Shallow Water Flow Zones in Deepwater Wells—Russian
Russian translation of RP 65.
1st Edition | September 2002 | Product Number: G56001R | Price: $96.00

RP 67
Recommended Practice for Oilfield Explosives Safety—Russian
Russian translation of RP 67.
2nd Edition | May 2007 | Product Number: G09309R | Price: $69.00

Std 520, Part I
Sizing, Selection, and Installation of Pressure-Relieving Devices—Part I—Sizing and Selection—Russian
Russian translation of Std 520, Part I.
9th Edition | July 2014 | Product Number: C520109R | Price: $272.00

Std 526 ■
Flanged Steel Pressure-Relief Valves—Russian
Russian translation of Std 526.
6th Edition | April 2009 | Product Number: C52606R | Price: $125.00

RP 554, Part 1
Process Control Systems, Part 1—Process Control Systems Functions and Functional Specification Development—Russian
Russian translation of RP 554, Part 1.
2nd Edition | July 2007 | Product Number: C55402R | Price: $112.00

RP 554, Part 2
Process Control Systems, Part 2—Process Control System Design—Russian
Russian translation of RP 554, Part 2.
1st Edition | October 2008 | Product Number: C554201R | Price: $112.00

RP 556
Instrumentation, Control, and Protective Systems for Gas Fired Heaters—Russian
Russian translation of RP 556.
2nd Edition | April 2011 | Product Number: C55602R | Price: $122.00

RP 578
Material Verification Program for New and Existing Alloy Piping Systems—Russian
Russian translation of RP 578.
2nd Edition | March 2010 | Product Number: C57802R | Price: $91.00

Std 599 ■
Metal Plug Valves—Flanged, Threaded, and Welding Ends—Russian
Russian translation of Std 599.
7th Edition | January 2013 | Product Number: C59907R | Price: $64.00

Std 603
Corrosion-Resistant, Bolted Bonnet Gate Valves—Flanged and Butt-Welding Ends—Russian
Russian translation of Std 603.
8th Edition | February 2013 | Product Number: C60308R | Price: $64.00

Std 608 ■
Metal Ball Valves—Flanged, Threaded, and Welding Ends—Russian
Russian translation of Std 608.
5th Edition | November 2012 | Product Number: C60805R | Price: $88.00

RP 621
Reconditioning of Metallic Gate, Globe, and Check Valves—Russian
Russian translation of RP 621.
3rd Edition | August 2010 | Product Number: C62103R | Price: $112.00

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—Russian
Russian translation of RP 934-A.
2nd Edition | May 2008 | Product Number: C934A02R | Price: $86.00

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RP 934-C
Materials and Fabrication of $1^1/_4$CR-$^1/_2$Mo Steel Heavy Wall Pressure Vessels for High Pressure Hydrogen Service Operating at or Below 825 °F (441 °C)—Russian

Russian translation of RP 934-C.

2nd Edition | May 2008 | Product Number: C934C01R | Price: $86.00

RP 934-E
Recommended Practice for Materials and Fabrication of $1^1/_4$Cr-$^1/_2$Mo Steel Pressure Vessels for Service Above 825 °F (440 °C)—Russian

Russian translation of RP 934-E.

1st Edition | August 2010 | Product Number: C934E01R | Price: $86.00

Std 1104
Welding of Pipelines and Related Facilities—Russian

Russian translation of Std 1104.

21st Edition | September 2013
Product Number: D110421R | Price: $276.00

SPANISH *

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

Spanish translation of Q1.

9th Edition | June 2013 | Product Number: G0Q109SP | Price: $120.00

Spec Q2
Specification for Quality Management System Requirements for Service Supply Organization for the Petroleum and Natural Gas Industries—Spanish

Spanish translation of Q2.

1st Edition | December 2011
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Chapter 1
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Standard Practice for the Manual Gauging of Petroleum and Petroleum Products—Spanish

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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.

2nd Edition | June 2001 | Product Number: H301B2SP | Price: $97.00

Chapter 3.2 ■
Standard Practice for Gauging Petroleum and Petroleum Products in Tank Cars—Spanish

Spanish translation of Ch. 3.2.

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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.

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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.

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Standard Practice for Level Measurement of Light Hydrocarbon Liquids Onboard Marine Vessels by Automatic Tank Gauging—Spanish

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Calculation of Static Petroleum Quantities, Part 1—Upright Cylindrical Tanks and Marine Vessels—Spanish
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Spanish translation of Ch. 13.1.
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Spanish translation of Ch. 17.2.
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Spanish translation of Ch. 17.5
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Spanish translation of Ch. 17.9, including Addendum 1 dated January 2014.
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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 58 of this Catalog) is to be utilized on all new applications.

Chapter 11.1
Volume Correction Factors—Volume I

Table 5A—Generalized Crude Oils and JP-4, Correction of Observed API Gravity to API Gravity at 60°F.

Table 6A—Generalized Crude Oils and JP-4, Correction of Volume to 60°F Against API Gravity at 60°F.

August 1980 | Reaffirmed, March 1997 | Price: $45.00

Chapter 11.1
Volume Correction Factors—Volume II

Table 5B—Generalized Products, Correction of Observed API Gravity to API Gravity at 60°F.

Table 6B—Generalized Products, Correction of Volume to 60°F Against API Gravity at 60°F.

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Chapter 11.1
Volume Correction Factors—Volume III

Table 6C—Volume Correction Factors for Individual and Special Applications, Volume Correction to 60°F Against Thermal Expansion Coefficients at 60°F.

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Chapter 11.1
Volume Correction Factors—Addendum to Volume III/IX Volume Correction—MTBE

Provides users of the API *Manual of Petroleum Measurement Standards* Chapter 11.1, Volume III (Table 6C) and Volume IX (Table 54C) with revised volume correction factor tables for MTBE. The tables can be used to expedite calculation of the volume of mixtures composed predominantly of MTBE at standard conditions from volumes at other conditions. These tables apply to commercially available mixtures containing at least 85 weight percent MTBE. The information gained from using these tables can be used to determine quantities of MTBE in tanks, shipping containers, and other storage containers typically used in the petroleum industry. Table 6C—Volume Correction Factors for Individual and Special Applications, Volume Correction for MTBE to 60°F and Volume IX, Table 54C—Volume Correction for Individual and Special Applications, Volume Correction for MTBE to 15°C. Pages: 4

1st Edition | January 1995 | Price: $45.00

Chapter 11.1
Volume Correction Factors—Volume IV

Table 23A—Generalized Crude Oils, Correction of Observed Relative Density to Relative Density at 60/60°F.

Table 24A—Generalized Crude Oils, Correction of Volume to 60°F Against Relative Density 60/60°F.

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Chapter 11.1
Volume Correction Factors—Volume V

Table 23B—Generalized Products, Correction of Observed Relative Density to Relative Density at 60/60°F.

Table 24B—Generalized Products, Correction of Volume to 60°F Against Relative Density 60/60°F.

August 1980 | Reaffirmed, March 1997 | Price: $50.00

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.

August 1980 | Reaffirmed, March 1997 | Price: $45.00

Chapter 11.1
Volume Correction Factors—Volume VII

Table 53A—Generalized Crude Oils, Correction of Observed Density to Density at 15°C.

Table 54A—Generalized Crude Oils, Correction of Volume to 15°C Against Density at 15°C.

August 1980 | Reaffirmed, March 1997 | Price: $50.00

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.

August 1980 | Reaffirmed, March 1997 | Price: $50.00

Chapter 11.1
Volume Correction Factors—Volume IX

Table 54C—Volume Correction Factors for Individual and Special Applications, Volume Correction to 15°C Against Thermal Expansion Coefficients at 15°C.

August 1980 | Reaffirmed, March 1997 | Price: $45.00

Chapter 11.1
Volume Correction Factors—Volume X

Background, Development, and Computer Documentation, including computer subroutines in Fortran IV for all volumes of Chapter 11.1, except Volumes XI/XII, XIII, and XIV. Implementation procedures, including rounding and truncating procedures, are also included. These subroutines are not available through API in magnetic or electronic form. Pages: 403

August 1980 | Reaffirmed, March 1997 | Price: $45.00

Chapter 11.1
Volume Correction Factors—Volume XI/XII
Superseded by Chapter 11.5, Parts 1 to 3, 2009
(see page 59 of this Catalog)

Two combined volumes, containing Petroleum Measurement Subsidiary Tables 1–4, 8–14, 21, 22, 26–31, 33, 34, 51, 52, and 56–58, which provide conversions between volume measures and density measures.

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Chapter 11.1
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.

January 1982 | Reaffirmed, March 1997 | Price: $50.00

Chapter 11.2.1
Compressibility Factors for Hydrocarbons: 0–90° API Gravity Range

Provides tables to correct hydrocarbon volumes metered under pressure to corresponding volumes at the equilibrium pressure for the metered temperature. It contains compressibility factors related to meter temperature and API gravity (60°F) of metered material. Pages: 149

1st Edition | August 1984 | Reaffirmed, May 1996 | Price: $142.00

Chapter 11.2.1M
Compressibility Factors for Hydrocarbons: 638–1074 Kilograms per Cubic Meter Range

Provides tables in metric (SI) units to correct hydrocarbon volumes metered under pressure to corresponding volumes at the equilibrium pressure for the metered temperature. It contains compressibility factors related to meter temperature and density (15 °C) of metered material. Pages: 187

1st Edition | August 1984 | Reaffirmed, May 1996 | Price: $142.00

Chapter 11.2
CD-ROM and Documentation of Chapters 11.2.1, 11.2.1M, 11.2.3, 11.2.3M

Includes tables found in Chapters 11.2.1, 11.2.1M, 11.2.3, and 11.2.3M, along with a computer documentation manual containing text information from those chapters. The tables, presented in both standard and metric (SI) units, cover compressibility factors for hydrocarbons and water calibration of volumetric provers. The tape is 9-track, 1600 bpi, unlabeled, 4-file type, and is available in either ASCII or EBCDIC format. Format desired must be specified when ordering. Now available on disk. Please specify when ordering.

1st Edition | 1984

Chapter 11.2
Computer Tape Information and Documentation for Chapters 11.2.1, 11.2.1M, 11.2.3 and 11.2.3M

Provides only the text information from Chapters 11.2.1, 11.2.1M, 11.2.3 and 11.2.3M, and information pertaining to the use of the magnetic tape described above. The manual is included with orders for the magnetic tape. Pages: 11

1st Edition | 1984

WITHDRAWN IN 2016

Std 2560
Reconciliation of Liquid Pipeline Quantities

1st Edition | December 2003

Chapter 17.7
Recommended Practices for Developing Barge Control Factors (Volume Ratio)

1st Edition | September 1995

WITHDRAWN PUBLICATIONS

The documents listed in this section have been withdrawn and are no longer being maintained by the responsible standards committee. Copies of these documents are available for purchase at www.api.org/publications.

Exploration and Production

Glossary of Oil Field Production Terminology, 1st ed. 1988

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

Vocational Training Series 1–6

- Book 1, Introduction to Oil and Gas Production, 4th ed. 1983
- Book 2, Corrosion of Oil and Gas Well Equipment, 1st ed. 1958, 2nd ed. 1990
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1 Specification for Oil-Field Belting, 10th ed. 1947, 11th ed. 1952, 12th ed. 1957

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1B Specification of Oil-Field V-Belting, 1st ed. 1957, 2nd ed. 1959, 3rd ed. 1961, 4th ed. 1964, 5th ed. 1978, 6th ed. 1995

2 Oil Field Boilers, 1st ed. 1928–10th ed. 1949

2A Planning, Designing, and Constructing Fixed Offshore Platforms, 1st ed. 1969, 2nd ed. 1971, 3rd ed. 1972, 4th ed. 1972, 5th ed. 1974, 6th ed. 1975, 7th ed. 1976, 8th ed. 1977, 9th ed. 1977, 10th ed. 1979, 11th ed. 1979, 12th ed. 1981, 13th ed. 1982, 14th ed. 1984, 15th ed. 1986, 16th ed. 1987, 17th ed. 1989, 18th ed. 1991, 19th ed. 1991

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

2B Fabricated Structural Steel Pipe, 1st ed. 1969, 2nd ed. 1972, 3rd ed. 1977

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2INT-DG Interim Guidance for Design of Offshore Structures for Hurricane Conditions, 1st ed. 2007

2INT-EX Interim Guidance for Assessment of Existing Offshore Structures for Hurricane Conditions, 1st ed. 2007

2INT-MET Interim Guidance on Hurricane Conditions in the Gulf of Mexico, 1st ed. 2007

2J Bulletin on Comparison of Marine Drilling Riser Analysis, 1st ed. 1977, 2nd ed. 1996

2K Care and Use of Marine Drilling Risers, 1st ed. 1977, 2nd ed. 1982

2L Planning, Designing, and Constructing Heliports for Fixed Offshore Platforms, 1st ed. 1978, 2nd ed. 1983

2M Qualifications Testing of Steel Anchor Designs for Floating Structures, 2nd ed. 1996

Historical Publications

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2P The Analysis of Spread Mooring Systems for Floating Drilling Units, 1st ed. 1984

2Q Design and Operation of Marine Drilling Riser Systems, 1st ed. 1982, 2nd ed. 1984

3 Recommended Practice for Cable Drilling and Fishing Tools, 1st ed. 1928, 2nd ed. 1988

3 Specification for Cable-Drilling Tools, 1st ed. 1928–13th ed. 1988

4 Standard Rigs and Derricks, 2nd ed. 1934–13th ed. 1947

4A Steel Derricks (Including Standard Rigs), 14th ed. 1952–16th ed. 1967

4B Wooden Derricks, 14th ed. 1952

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5 Care and Use of Oil Country Tubular Goods, 1st ed. 1929

5A Sharp-Thread Casing and Tubing, 3rd ed. 1955–39th ed. 1987

5A1 Minimum Performance Properties Proposed API High-Strength Casing Joints, 3rd ed. 1949

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5A4 Care and Use of Reinforced Thermosetting Resin Casing and Tubing, 1st ed. 1976

5AC Casing and Tubing for Sulfide Service, 1st ed. 1963–16th ed. 1987

5AQ Q125 Casing, 1st ed. 1985, 2nd ed. 1987

5AR Reinforced Thermosetting Resin Casing and Tubing, 1st ed. 1975, 2nd ed. 1981

5AX High-Strength Casing and Tubing, 1st ed. 1960–15th ed. 1987

5C2 Performance Properties of Casing and Tubing, 4th ed. 1948–21st ed. 1999

5C4 Round Thread Casing Joint Strength with Combined Internal Pressure and Bending, 2nd ed. 1987

5C7 Recommended Practice for Coiled Tubing Operations in Oil and Gas Well Services, 1st ed. 1996

5CTM Casing and Tubing (Metric Units), 5th ed. 1995

5D Conversion of English to Metric Units as Applicable to API Standards on Tubular Goods, 1st ed. 1960

5D Specification for Drill Pipe, 1st ed. 1988, 2nd ed. 1991

5G1 Iron and Steel Flanged Gate, Plug, and Check Valves for Pipe Line Service, 4th ed. 1946

5G2 Steel Flanged Gate and Plug Valves for Drilling and Production Service, 5th ed. 1946

5L4 Care and Use of Reinforced Thermosetting Resin Line Pipe, 1st ed. 1972, 2nd ed. 1976

5L5 Marine Transportation of Line Pipe, 1st ed. 1975

5L6 Transportation of Line Pipe on Inland Waterways, 1st ed. 1979

5LA Aluminum Alloy Line Pipe, 1st ed. 1962

5LE Polyethylene Line Pipe, 1st ed. 1975–3rd ed. 1981

5LP Thermoplastic Line Pipe, 1st ed. 1968–5th ed. 1981

5LR Glass Fiber Reinforced Thermosetting Resin Line Pipe, 1st ed. 1968–4th ed. 1976

5LS Spiral-Weld Line Pipe, 1st ed. 1965–12th ed. 1982

5LU Ultra High-Test Heat Treated Line Pipe, 1st ed. 1972–3rd ed. 1980

5LX High-Test Line Pipe, 1st ed. 1948–24th ed. 1982

5UO1 Voluntary Unit Agreement, 4th ed. 1993

5UO2 Voluntary Unit Operating Agreement, 4th ed. 1993

5UO3 Statutory Unit Agreement, 2nd ed. 1993

5UO4 Statutory Unit Operating Agreement, 2nd ed. 1993

6 Rig Irons, 1st ed. 1929

6 Safe Practices in Well-Pulling Operations, 1956

6A1 Obsolete Appendixes from Spec 6A Eleventh Edition (Wellhead Equipment), 1st ed. 1979

6AB 30,000 PSI Flanged Wellhead Equipment, 1st ed. 1983

6AR Recommended Practice for Repair and Remanufacture of Wellhead and Christmas Tree Equipment, 1st ed. 1994

6A4 Specification for Repair and Remanufacture of Wellhead and Christmas Tree Equipment, 1st ed. 1988

6A718 Nickel Base Alloy 718 (UNS N07718) for Oil and Gas Drilling and Production Equipment, 1st ed. 2004, 2nd ed. 2009

6B Ring-Joint Flanges, 4th ed. 1949–6th ed. 1960

6BX Ring-Joint Flanges for Drilling and Production Service for Extreme Pressures, 1st ed. 1958–3rd ed. 1960

6C Flanged Steel Gate and Plug Valves for Drilling and Production Service, 7th ed. 1949–11th ed. 1960

6CM Flanged Steel Gate and Plug Valves for Multiple Parallel String Completions In Production Service, 1st ed. 1960

6E Wellhead Equipment, 2nd ed. 1950–6th ed. 1960

6F Fire Test for Valves, 1st ed. 1978–3rd ed. 1982

6FC Specification for Fire Test for Valves with Automatic Backseats, 4th ed. 2009

6G Through Flowline (TFL) Pump Down Systems, 1st ed. 1978–3rd ed. 1982

6H Specification on End Closures, Connectors, and Swivels, 2nd ed. 1998

6RS Referenced Standards for Committee 6, Standardization of Valves and Wellhead Equipment, 1st ed. 1990

7 Transmission Standard, 1st ed. 1922–6th ed. 1944

7 Rotary Drilling Equipment, 11th ed. 1953–36th ed. 1989, 40th ed. 2001

7A Recommended Practice for Hard Facing Rotary Bits, 1st ed. 1932

7A1 Recommended Practice for Testing of Thread Compound for Rotary Shouldered Connections, 1st ed. 1992

7B Rotary Drilling Equipment, 1st ed. 1927–10th ed. 1947

7B-11C Internal-Combustion Engines and Unit-Type Radiator coolers for Oil-Field Service, 6th ed. 1953–9th ed. 1994

7C Dimensional Standards for Line Shafts, 1st ed. 1927

7C-11F Installation, Maintenance, and Operation of Internal-Combustion Engines, 2nd ed. 1955–5th ed. 1994

7C-11G Rating of Drilling and Production Hoisting Equipment, 1st ed. 1949

7D Oil-Field Boilers, 10th ed. 1949

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7H Drilling Machinery, 1st ed. 1979–7th ed. 1981

7J Specification for Drill Pipe/Casing Protectors (DP/CP), 1st ed. 1985

8A Specification for Drilling and Production Equipment, 1st ed. 1949–11th ed. 1985, 13th ed. 1997

8B Internal-Combustion Engines and Unit-Type Radiator Coolers and Oil-Field Service, 6th ed. 1953

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10 Safe Practices in Drilling Operations, 1953

10 Materials and Testing for Well Cements, 1st ed. 1982–5th ed. 1990

10B Recommended Practice for Testing Oil-Well Cements, 3rd ed. 1953–22nd ed. 1997

10C Oil-Well Cement Nomenclature, 1st ed. 1963, 3rd ed. 1984

10E Application of Cement Lining to Steel Tubular Goods, Handling, Installation and Joining, 1st ed. 1978–3rd ed. 1994

11A Care and Use of Oil Well Pumps, 1st ed. 1927–7th ed. 1944

11B Installation, Operation and Care of Oil Field Gas Engines, 1st ed. 1933

11C Internal Combustion Engine and Clutches for Oil Field Service, 1st ed. 1927–5th ed. 1942

Historical Publications

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11C Reinforced Plastic Sucker Rods, 1st ed. 1986, 2nd ed. 1988

11D Miscellaneous Pumping Equipment, 1st ed. 1923–7th ed. 1964

11D2 Progressing Cavity Pump Systems for Artificial Lift-Pumps, 1st ed. 2010

11G Rating of Sucker Rod and Tubing Hoisting Equipment, 2nd ed. 1941

11H Recommended Practice for Electrical Surface Pumping Equipment, 1st ed. 1959

11IW Specification for Independent Wellhead Equipment, 1st ed. 2000

11J Recommended Practice for Placement of Electrical Equipment on Production Leases, 1st ed. 1961

11K Data Sheet for the Design of Air Exchange Coolers for Packaged Compressor Units, 1st ed. 1974, 2nd ed. 1998

11L Recommended Practice for Design Calculations for Sucker Rod Pumping systems, 1st ed. 1967–4th ed. 1988

11L4 Curves for Selecting Beam Pumping Units, 1st ed. 1970

11M Recommended Practice for Grounded 830-Volt, Three-Phase Electrical System for Oil Field Service, 1st ed. 1973

11N Specification for Lease Automatic Custody Transfer (LACT) Equipment, 1st ed. 1975–4th ed. 1994

11P Specification for Packaged High Speed Separable Engine Driven Reciprocating Gas Compressors, 1st ed. 1975, 2nd ed. 1989

11PGT Recommended Practice for Packaged Combustion Gas Turbines, 1st ed. 1992

11R Recommended Practice for Electric Submersible Pump Installations, 1st ed. 1980–2nd ed. 1986

11T Recommended Practice for Installation and Operation of Wet Steam Generators, 1st ed. 1983, 2nd ed. 1994

11U Recommended Practice for Sizing and Selection of Electric Submersible Pumps, 1st ed. 1984–2nd ed. 1986

11V1 Specification for Gas Lift Valves, Orifices, Reverse Flow Valves and Dummy Valves, 1st ed. 1988, 2nd ed. 1995

11V2 Gas Lift Valve Performance Testing, 2nd ed. 2001

11V7 Recommended Practice for Repair, Testing and Setting Gas Lift Valves, 2nd ed. 1999

11V10 Recommended Practices for Design and Operation of Intermittent and Chamber Gas-Lift Wells and Systems, 1st ed. 2008

12A Specification for Standard Tanks with Riveted Shells, 1st ed. 1928–7th ed. 1941

12C All-Welded Oil Storage Tanks, 1st ed. 1936–15th ed. 1958

12D Large Welded Production Tanks, 3rd ed. 1944–10th ed. 1994

12E Wooden Tanks, 1st ed. 1943–6th ed. 1956

12G Welded Aluminum-Alloy Storage Tanks, 1st ed. 1957

12GDU Specification for Glycol-Type Gas Dehydration Units, 1st ed. 1990

12H Recommended Practice for Installation of New Bottoms In Old Storage Tanks, 1st ed. 1957

12L Vertical Emulsion Treaters, 1st ed. 1967–4th ed. 1994

12M Oil Field Thermal Recovery Steam Generators, 1st ed. 1966, 2nd ed. 1967

13B Standard Procedure for Testing Drilling Fluids, 1st ed. 1962–14th ed. 1991

13E Recommended Practice for Shale Shaker screen Cloth Designation, 1st ed. 1977–3rd ed. 1993

13F Drilling Mud Report Form, 1st ed. 1981

13G Drilling Fluid Bioassays, 1st ed. 1984–3rd ed. 1991

14BM User's Manual for API 14B Subsurface Controlled Subsurface Safety Valve Sizing computer Program, 1st ed. 1974, 2nd ed. 1978

14D Wellhead Surface Safety Valves for Offshore Service, 1st ed. 1975–9th ed. 1994

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MPMS	Ch. 2.2F/ISO 12917-2:2002	Petroleum and Liquid Petroleum Products—Calibration of Horizontal Cylindrical Tanks—Part 2: Internal Electro-Optical Distance-Ranging Method	1st	2004	HH202F01	$77.00	50
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MPMS	Ch. 3.2	Standard Practice for Gauging Petroleum and Petroleum Products in Tank Cars	1st	1995	H03021	$97.00	51
MPMS	Ch. 3.2	Standard Practice for Gauging Petroleum and Petroleum Products in Tank Cars—Spanish	1st	1995	H03021S	$97.00	51, 170
MPMS	Ch. 3.3	Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Pressurized Storage Tanks by Automatic Tank Gauging	1st	1996	H03031	$83.00	51
MPMS	Ch. 3.3	Standard Practice for Level Measurement of Liquid Hydrocarbons in Stationary Pressurized Storage Tanks by Automatic Tank Gauging—Spanish	1st	1996	H030316	$83.00	51, 170
MPMS	Ch. 3.4	Standard Practice for Level Measurement of Liquid Hydrocarbons on Marine Vessels by Automatic Tank Gauging	1st	1995	H03041	$83.00	51
MPMS	Ch. 3.4	Standard Practice for Level Measurement of Liquid Hydrocarbons on Marine Vessels by Automatic Tank Gauging—Spanish	1st	1995	H03041SP	$83.00	51, 170
MPMS	Ch. 3.5	Standard Practice for Level Measurement of Light Hydrocarbon Liquids Onboard Marine Vessels by Automatic Tank Gauging	1st	1997	H03051	$83.00	51
MPMS	Ch. 3.5	Standard Practice for Level Measurement of Light Hydrocarbon Liquids Onboard Marine Vessels by Automatic Tank Gauging—Spanish	1st	1997	H03051S	$83.00	51, 170
MPMS	Ch. 3.6	Measurement of Liquid Hydrocarbons by Hybrid Tank Measurement Systems	1st	2001	H03061	$96.00	51
MPMS	Ch. 4.1	Introduction	3rd	2005	H04013	$82.00	51
MPMS	Ch. 4.1	Introduction—Spanish	3rd	2005	H40101S	$82.00	52, 170
MPMS	Ch. 4.2	Displacement Provers	3rd	2003	H04023	$123.00	52
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MPMS	Ch. 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	1st	2010	H409031	$74.00	53
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MPMS	Ch. 5.1	General Considerations for Measurement by Meters—Spanish	4th	2005	H05014SP	$94.00	53, 170
MPMS	Ch. 5.2	Measurement of Liquid Hydrocarbons by Displacement Meters	3rd	2005	H05023	$87.00	53
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MPMS	Ch. 5.3	Measurement of Liquid Hydrocarbons by Turbine Meters	5th	2005	H05035	$106.00	53
MPMS	Ch. 5.3	Measurement of Liquid Hydrocarbons by Turbine Meters—Spanish	5th	2005	H50305SP	$106.00	53, 171

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MPMS	Ch. 5.4	Accessory Equipment for Liquid Meters—Spanish	4th	2005	H05044SP	$94.00	53, 171
MPMS	Ch. 5.5	Fidelity and Security of Flow Measurement Pulsed-Data Transmission Systems	2nd	2005	H50502	$70.00	53
MPMS	Ch. 5.5	Fidelity and Security of Flow Measurement Pulsed-Data Transmission Systems—Spanish	2nd	2005	H50502SP	$70.00	54, 171
MPMS	Ch. 5.6	Measurement of Liquid Hydrocarbons by Coriolis Meters	1st	2002	H05061	$139.00	54
MPMS	Ch. 5.6	Measurement of Liquid Hydrocarbons by Coriolis Meters—Spanish	1st	2002	H05061S	$139.00	54, 171
MPMS	Ch. 5.8	Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters	2nd	2011	H050802	$86.00	54
MPMS	Ch. 5.8	Measurement of Liquid Hydrocarbons by Ultrasonic Flow Meters—Spanish	2nd	2011	H050802SP	$86.00	54, 171
MPMS	Ch. 6.1	Lease Automatic Custody Transfer (LACT) Systems	2nd	1991	H30121	$60.00	54
MPMS	Ch. 6.2	Loading Rack Metering Systems	3rd	2004	H60203	$79.00	54
MPMS	Ch. 6.2	Loading Rack Metering Systems—Spanish	3rd	2004	H60203S	$79.00	54, 171
MPMS	Ch. 6.5	Metering Systems for Loading and Unloading Marine Bulk Carriers	2nd	1991	H30125	$65.00	54
MPMS	Ch. 6.6	Pipeline Metering Systems	2nd	1991	H30126	$65.00	54
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MPMS	Ch. 7	Temperature Determination	1st	2001	H07001	$197.00	54
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MPMS	Ch. 7.3	Temperature Determination—Fixed Automatic Tank Temperature Systems—Spanish	2nd	2011	H70302SP	$83.00	55, 171
MPMS	Ch. 7.5/ISO 8310:2012	Temperature Determination—Automatic Tank Temperature Measurement Onboard Marine Vessels Carrying Refrigerated Hydrocarbon and Chemical Gas Fluids	1st	2014	HH70501	$95.00	55
MPMS	Ch. 8.1	Standard Practice for Manual Sampling of Petroleum and Petroleum Products	4th	2013	H80104	$120.00	55
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MPMS	Ch. 8.3	Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products	1st	1995	H08031	$89.00	55
MPMS	Ch. 8.3	Standard Practice for Mixing and Handling of Liquid Samples of Petroleum and Petroleum Products—Spanish	1st	1995	H80301SP	$89.00	55, 171
MPMS	Ch. 8.4	Standard Practice for Sampling and Handling of Fuels for Volatility Measurement	3rd	2014	H80403	$41.00	55
MPMS	Ch. 8.5	Standard Practice for Manual Piston Cylinder Sampling for Volatile Crude Oils, Condensates, and Liquid Petroleum Products	1st	2015	H80501	$50.00	56
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MPMS	Ch. 9.2	Standard Test Method for Density or Relative Density of Light Hydrocarbons by Pressure Hydrometer	3rd	2012	H09023	$41.00	56
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MPMS	Ch. 10.4	Determination of Water and/or Sediment in Crude Oil by the Centrifuge Method (Field Procedure)	4th	2013	H100404	$85.00	56
MPMS	Ch. 10.5	Standard Test Method for Water in Petroleum Products and Bituminous Materials by Distillation	5th	2013	H100505	$41.00	57
MPMS	Ch. 10.6	Standard Test Method for Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure)	5th	2013	H100605	$41.00	57
MPMS	Ch. 10.7	Standard Test Method for Water in Crude Oils by Potentiometric Karl Fischer Titration	2nd	2002	H10072	$39.00	57
MPMS	Ch. 10.8	Standard Test Method for Sediment in Crude Oil by Membrane Filtration	2nd	2005	H100802	$39.00	57
MPMS	Ch. 10.9	Standard Test Method for Water in Crude Oils by Coulometric Karl Fischer Titration	3rd	2013	H10093	$41.00	57
MPMS	Ch. 10.9	Standard Test Method for Water in Crude Oils by Coulometric Karl Fischer Titration—Spanish	3rd	2013	H100903SP	$41.00	57, 171
MPMS	Ch. 11.1	Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils		2004	H11013	see listing	57
MPMS	Ch. 11.1	Add-In Program for Microsoft® Excel			see listing		58
MPMS	Ch. 11.1	Dynamic Link Library (DLL)			see listing		58
MPMS	Ch. 11.1	Source Code			see listing		58
MPMS	Ch. 11.1	Source Code, DLL & XL Add-In—Combined			see listing		58
MPMS	Ch. 11.2	Data File of Chapters 11.2.2 and 11.2.2M	1st	1984	H27320	$296.00	58
MPMS	Ch. 11.2.2	Compressibility Factors for Hydrocarbons: 0.350–0.637 Relative Density (60 °F/60 °F) and -50 °F to 140 °F Metering Temperature	2nd	1986	H27307	$171.00	59
MPMS	Ch. 11.2.2M	Compressibility Factors for Hydrocarbons: 350–637 Kilograms per Cubic Meter Density (15 °C) and -46 °C to 60 °C Metering Temperature	1st	1986	H27309	$171.00	59
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Pub	Number	Title	Edition	Date	Product Number	Price	Page(s)
MPMS	Ch. 11.3.3	Miscellaneous Hydrocarbon Product Properties—Denatured Ethanol Density and Volume Correction Factors	2nd	2015	H1103032	$145.00	59
MPMS	Ch. 11.3.3.2	Propylene Compressibility		1974	H25656	$296.00	59
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MPMS	Ch. 11.5, Parts 1 to 3	Density/Weight/Volume Intraconversion, Parts 1, 2, and 3	1st	2009	H1105CD	$248.00	59
MPMS	Ch. 12.1.1	Calculation of Static Petroleum Quantities, Part 1—Upright Cylindrical Tanks and Marine Vessels	3rd	2012	H1201013	$114.00	60
MPMS	Ch. 12.1.1	Calculation of Static Petroleum Quantities, Part 1—Upright Cylindrical Tanks and Marine Vessels—Spanish	3rd	2012	H1201013SP	$114.00	61, 171
MPMS	Ch. 12.1.2	Calculation of Static Petroleum Quantities, Part 2—Calculation Procedures for Tank Cars	1st	2003	H12121	$111.00	61
MPMS	Ch. 12.1.2	Calculation of Static Petroleum Quantities, Part 2—Calculation Procedures for Tank Cars—Spanish	1st	2003	H12121S	$111.00	61, 171
MPMS	Ch. 12.2.1	Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 1—Introduction	2nd	1995	H12021	$109.00	61
MPMS	Ch. 12.2.2	Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 2—Measurement Tickets	3rd	2003	H12223	$101.00	61
MPMS	Ch. 12.2.3	Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 3—Proving Reports	1st	1998	H12023	$119.00	61
MPMS	Ch. 12.2.4	Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 4—Calculation of Base Prover Volumes by Waterdraw Method	1st	1997	H12024	$122.00	61
MPMS	Ch. 12.2.5	Calculation of Petroleum Quantities Using Dynamic Measurement Methods and Volumetric Correction Factors, Part 5—Base Prover Volume Using Master Meter Method	1st	2001	H12025	$170.00	61
MPMS	Ch. 12.3	Calculation of Volumetric Shrinkage from Blending Light Hydrocarbons with Crude Oils	1st	1996	H12031	$89.00	61
MPMS	Ch. 13.1	Statistical Concepts and Procedures in Measurement	1st	1985	H30321	$83.00	62
MPMS	Ch. 13.1	Statistical Concepts and Procedures in Measurement—Spanish	1st	1985	H130101SP	$83.00	62, 171
MPMS	Ch. 13.2	Methods of Evaluating Meter Proving Data	1st	1994	H13021	$97.00	62
MPMS	13.3	Measurement Uncertainty	1st	2016	H130301	$103.00	62
MPMS	Ch. 14.1	Collecting and Handling of Natural Gas Samples for Custody Transfer	7th	2016	H140107	$209.00	62
MPMS	Ch. 14.2	Compressibility Factors of Natural Gas and Other Related Hydrocarbon Gases	2nd	1994	see listing		62
MPMS	Ch. 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	4th	2012	H1403014	$181.00	62
MPMS	Ch. 14.3.2	Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids—Concentric, Square-Edged Orifice Meters, Part 2: Specification and Installation Requirements	5th	2016	H1403025	$188.00	62
MPMS	Ch. 14.3.3	Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids—Concentric, Square-Edged Orifice Meters, Part 3: Natural Gas Applications	4th	2013	H1403034	$220.00	62
MPMS	Ch. 14.3.4	Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids—Concentric, Square-Edged Orifice Meters, Part 4: Background, Development, Implementation Procedures and Subroutine Documentation	3rd	1992	H30354	$164.00	63
MPMS	Ch. 14.4	Converting Mass of Natural Gas Liquids and Vapors to Equivalent Liquid Volumes	1st	1991	H30344	$59.00	63
MPMS	Ch. 14.5	Calculation of Gross Heating Value, Relative Density, Compressibility and Theoretical Hydrocarbon Liquid Content for Natural Gas Mixtures for Custody Transfer	3rd	2009	H140503	$73.00	63
MPMS	Ch. 14.6	Continuous Density Measurement	2nd	1991	H30346	$132.00	63
MPMS	Ch. 14.7	Mass Measurement of Natural Gas Liquids	4th	2012	H140704	$65.00	63
MPMS	Ch. 14.8	Liquefied Petroleum Gas Measurement	2nd	1997	H14082	$97.00	63
MPMS	Ch. 14.9	Measurement of Natural Gas by Coriolis Meter	2nd	2013	see listing		63
MPMS	Ch. 14.10	Measurement of Flow to Flares	1st	2007	H140101	$107.00	63
MPMS	Ch. 15	Guidelines for the Use of the International System of Units (SI) in the Petroleum and Allied Industries	3rd	2001	H15003	$115.00	64
MPMS	Ch. 16.2	Mass Measurement of Liquid Hydrocarbons in Vertical Cylindrical Storage Tanks by Hydrostatic Tank Gauging	1st	1994	H16021	$97.00	64
MPMS	Ch. 17.1	Guidelines for Marine Inspection	6th	2014	H170106	$150.00	64
MPMS	Ch. 17.2	Measurement of Cargoes On Board Tank Vessels	2nd	1999	H17022	$132.00	64
MPMS	Ch. 17.2	Measurement of Cargoes On Board Tank Vessels—Spanish	2nd	1999	H1702SP	$132.00	64, 171
MPMS	Ch. 17.3	Guidelines for Identification of the Source of Free Waters Associated with Marine Petroleum Cargo Movements	2nd	2016	H170302	$120.00	64
MPMS	Ch. 17.4	Method for Quantification of Small Volumes on Marine Vessels (OBQ/ROB)	2nd	2016	H170402	$110.00	64
MPMS	Ch. 17.5	Guidelines for Voyage Analysis and Reconciliation of Cargo Quantities	3rd	2012	H170503	$145.00	64
MPMS	Ch. 17.5	Guidelines for Voyage Analysis and Reconciliation of Cargo Quantities—Spanish	3rd	2012	H170503SP	$145.00	65, 171
MPMS	Ch. 17.6	Guidelines for Determining Fullness of Pipelines Between Vessels and Shore Tanks	2nd	2014	H170602	$110.00	65
MPMS	Ch. 17.8	Guidelines for Pre-Loading Inspection of Marine Vessel Cargo Tanks and Their Cargo-Handling Systems	2nd	2016	H170802	$108.00	65
MPMS	Ch. 17.9	Vessel Experience Factor (VEF)	2nd	2012	H170902	$165.00	65
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Publications by Number

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MPMS	Ch. 17.10.2	Measurement of Cargoes On Board Marine Gas Carriers, Part 2—Liquefied Petroleum and Chemical Gases	2nd	2016	H171022	$150.00	65
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MPMS	Ch. 18.1	Measurement Procedures for Crude Oil Gathered from Small Tanks by Truck	2nd	1997	H18012	$115.00	65
MPMS	Ch. 18.2	Custody Transfer of Crude Oil from Lease Tanks Using Alternative Measurement Methods	1st	2016	H180201	$125.00	66
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MPMS	Ch. 19.2	Evaporative Loss from Floating-Roof Tanks	3rd	2012	H190203	$176.00	66
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MPMS	Ch. 19.3, Part B	Air Concentration Test Method—Rim-Seal Loss Factors for Floating-Roof Tanks	1st	1997	H1903B	$122.00	67
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MPMS	Ch. 19.4	Evaporative Loss Reference Information and Speciation Methodology	3rd	2012	H190403	$196.00	67
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MPMS	Ch. 20.2	Production Allocation Measurement Using Single-Phase Devices	1st	2016	H200201	$124.00	69
MPMS	Ch. 20.3	Measurement of Multiphase Flow	1st	2013	H200301	$180.00	69
MPMS	Ch. 21.1	Flow Measurement Using Electronic Metering Systems—Electronic Gas Measurement	2nd	2013	H210102	$165.00	70
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MPMS	Ch. 22.6	Testing Protocol for Gas Chromatographs	1st	2015	H220601	$98.00	71
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Bull	E1	Generic Hazardous Chemical Category List and Inventory for the Oil and Gas Exploration and Production Industry	2nd	1990	G11000	$142.00	46
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API	E5	Environmental Guidance Document: Waste Management in Exploration and Production Operations	2nd	1997	GE5002	$125.00	47
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API	HF2	Water Management Associated with Hydraulic Fracturing	1st	2010	GHF201	$42.00	44, 115
API	HF3	Practices for Mitigating Surface Impacts Associated with Hydraulic Fracturing	1st	2011	GHF301	42.00	44, 115
API	OSRC	Proceedings of the 2014 Offshore Structural Reliability Conference	1st	2015	see listing		2
Spec	Q1	Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry	9th	2013	G0Q109	$120.00	1
Spec	Q1	Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry—Chinese	9th	2013	G0Q109C	$84.00	1, 163
Spec	Q1	Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry—Portuguese	9th	2013	G0Q109P	$120.00	1, 167
Spec	Q1	Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry—Russian	9th	2013	G0Q109R	$96.00	1, 167
Spec	Q1	Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry—Spanish	9th	2013	G0Q109SP	$120.00	1, 170

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Spec	Q2	Specification for Quality Management System Requirements for Service Supply Organizations for the Petroleum and Natural Gas Industries–Chinese	1st	2011	G0Q201C	$56.00	1, 163
Spec	Q2	Specification for Quality Management System Requirements for Service Supply Organization for the Petroleum and Natural Gas Industries–Portuguese	1st	2011	G0Q201P	$80.00	1, 167
Spec	Q2	Specification for Quality Management System Requirements for Service Supply Organization for the Petroleum and Natural Gas Industries–Russian	1st	2011	G0Q201R	$64.00	1, 167
Spec	Q2	Specification for Quality Management System Requirements for Service Supply Organization for the Petroleum and Natural Gas Industries–Spanish	1st	2011	G0Q201SP	$80.00	2, 170
RP	T-1	Orientation Programs for Personnel Going Offshore for the First Time	5th	2016	GT1005	$65.00	42
RP	T-2	Recommended Practice for Qualification Programs for Offshore Production Personnel Who Work with Safety Devices	2nd	2001	GT7002	$59.00	42
RP	T-4	Training of Offshore Personnel in Nonoperating Emergencies	2nd	1995	GT4002	$59.00	42
RP	T-6	Recommended Practice for Training and Qualification of Personnel in Well Control Equipment and Techniques for Wireline Operations on Offshore Locations	1st	2002	GT0601	$59.00	43
RP	T-7	Training of Personnel in Rescue of Persons in Water	2nd	1995	GT7002	$57.00	43
RP	1FSC	Facilities Systems Completion Planning and Execution	1st	2013	G1FSC01	$60.00	2
TR	1PER15K-1	Protocol for Verification and Validation of High-Pressure High-Temperature Equipment	1st	2013	G1PER15K11	$147.00	2
RP	2A-WSD	Planning, Designing, and Constructing Fixed Offshore Platforms–Working Stress Design	22nd	2014	G2AWSD22	$395.00	2
Spec	2B	Specification for the Fabrication of Structural Steel Pipe	6th	2001	G02B06	$83.00	2
Spec	2B	Specification for the Fabrication of Structural Steel Pipe–Chinese	6th	2001	G02B06C	$59.00	2, 163
Spec	2C	Offshore Pedestal–Mounted Cranes	7th	2012	G02C07	$143.00	3
Spec	2C	Offshore Pedestal–Mounted Cranes–Chinese	7th	2012	G02C07C	$101.00	3, 163
RP	2D	Operation and Maintenance of Offshore Cranes	7th	2014	G02D07	$145.00	3
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Spec	2F	Specification for Mooring Chain	6th	1997	G02F06	$89.00	3
Spec	2F	Specification for Mooring Chain–Chinese	6th	1997	G02F06C	$63.00	3, 163
RP	2FB	Recommended Practice for Design of Offshore Facilities Against Fire and Blast Loading	1st	2006	G2FB01	$157.00	3
RP	2FPS	Planning, Designing, and Constructing Floating Production Systems	2nd	2011	G2FPS02	$186.00	3
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RP	2MET/ISO 19901-1:2006	Deprivation of Metocean Design and Operating Conditions	1st	2014	GG2MET01	$200.00	4
RP	2MOP/ISO 19901-6:2009	Marine Operations	1st	2010	GG2M0P1	$243.00	4
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Spec	2MT2	Rolled Shapes with Improved Notch Toughness	1st	2002	G2MT21	$79.00	5
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Spec	2W	Specification for Steel Plates for Offshore Structures, Produced by Thermo-Mechanical Control Processing (TMCP)–Russian	5th	2006	G02W05R	$76.00	6, 167

Pub	Number	Title	Edition	Date	Product Number	Price	Page(s)
RP	2X	Recommended Practice for Ultrasonic and Magnetic Examination of Offshore Structural Fabrication and Guidelines for Qualification of Technicians	4th	2004	G02X04	$147.00	6
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RP	2Z	Recommendation Practice for Preproduction Qualification for Steel Plates for Offshore Structures	4th	2005	G02Z04	$119.00	7
Spec	4F	Specification for Drilling and Well Servicing Structures	4th	2013	G04G04	$115.00	7
Spec	4F	Specification for Drilling and Well Servicing Structures—Chinese	4th	2013	G04F04C	$81.00	7, 163
RP	4G	Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures	4th	2012	G04G04	$116.00	7
RP	4G	Operation, Inspection, Maintenance, and Repair of Drilling and Well Servicing Structures—Chinese	4th	2012	G04G04C	$82.00	7, 163
RP	5A3/ISO 13678:2010	Recommended Practice on Thread Compounds for Casing, Tubing, Line Pipe, and Drill Stem Elements	3rd	2009	GX5A303	$145.00	7
RP	5A5/ISO 15463:2003	Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe	7th	2005	GX5A507	$157.00	7
RP	5A5/ISO 15463:2003	Field Inspection of New Casing, Tubing, and Plain-End Drill Pipe—Chinese	7th	2005	GX5A507C	$110.00	7, 163
Spec	5B	Specification for Threading, Gauging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads	15th	2008	G5B015	$118.00	8
Spec	5B	Specification for Threading, Gauging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads—Chinese	15th	2008	G05B15C	$83.00	8, 163
Spec	5B	Specification for Threading, Gauging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads—Kazakh	15th	2008	G05B15K	$95.00	8, 166
Spec	5B	Specification for Threading, Gauging and Thread Inspection of Casing, Tubing, and Line Pipe Threads—Russian	15th	2008	G05B15R	$114.00	8, 167
RP	5B1	Gauging and Inspection of Casing, Tubing and Line Pipe Threads	5th	1999	G05B105	$142.00	8
RP	5B1	Gauging and Inspection of Casing, Tubing and Line Pipe Threads—Kazakh	5th	1999	G05B15K	$114.00	8, 166
RP	5B1	Gauging and Inspection of Casing, Tubing and Pipe Line Threads—Russian	5th	1999	G05B15R	$114.00	8, 167
RP	5C1	Recommended Practice for Care and Use of Casing and Tubing	18th	1999	G05C18	$115.00	8
RP	5C1	Recommended Practice for Care and Use of Casing and Tubing—Chinese	18th	1999	G05C18C	$81.00	8, 163
TR	5C3/ISO 10400:2007	Technical Report on Equations and Calculations for Casing, Tubing, and Line Pipe used as Casing or Tubing; and Performance Properties Tables for Casing and Tubing	1st	2008	G5C301	$206.00	8
RP	5C5	Procedures for Testing Casing and Tubing Connections	4th	2017	GX5C504	$180.00	8
RP	5C6	Welding Connections to Pipe	2nd	2006	G05C62	$86.00	8
RP	5C6	Welding Connections to Pipe—Chinese	2nd	2006	G05C62C	$61.00	8, 163
RP	5C8	Care, Maintenance, and Inspection of Coiled Tubing	1st	2017	G05C301	$120.00	8
Spec	5CRA/ISO 13680:2008	Specification for Corrosion Resistant Alloy Seamless Tubes for Use as Casing, Tubing and Coupling Stock	1st	2010	GG5CRA01	$155.00	9
Spec	5CT	Specification for Casing and Tubing	9th	2011	G5CT09	$237.00	9
Spec	5CT	Specification for Casing and Tubing—Chinese	9th	2011	G5CT09C	$166.00	9, 163
Spec	5CT	Specification for Casing and Tubing—Portuguese	9th	2011	G5CT09P	$237.00	9, 167
Spec	5CT	Specification for Casing and Tubing—Russian	9th	2011	G5CT09R	$190.00	9, 167
Spec	5CT	Specification for Casing and Tubing—Spanish	9th	2011	G5CT09SP	$237.00	9, 170
Spec	5DP/ISO 11961:2008	Specification for Drill Pipe	1st	2009	GX5DP01	$181.00	9
Spec	5DP/ISO 11961:2008	Specification for Drill Pipe—Chinese	1st	2009	GX5DP01C	$127.00	9, 163
Spec	5L	Specification for Line Pipe	45th	2012	G05L45	$258.00	9
Spec	5L	Specification for Line Pipe—Chinese	45th	2012	G05L45C	$181.00	9, 163
Spec	5L	Specification for Line Pipe—Portuguese	45th	2012	G05L45P	$258.00	9, 167
Spec	5L	Specification for Line Pipe—Russian	45th	2012	G05L45R	$207.00	9, 168
Spec	5L	Specification for Line Pipe—Spanish	45th	2012	G05L45SP	$258.00	9, 170
RP	5L1	Recommended Practice for Railroad Transportation of Line Pipe	7th	2009	G5L107	$59.00	10
RP	5L2	Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service	4th	2002	G5L204	$83.00	10
RP	5L2	Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service—Chinese	4th	2002	G5L204C	$59.00	10, 163
RP	5L2	Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service—Kazakh	4th	2002	G5L204K	$67.00	10, 166
RP	5L2	Recommended Practice for Internal Coating of Line Pipe for Non-Corrosive Gas Transmission Service—Russian	4th	2002	G5L204R	$67.00	10, 168
RP	5L3	Drop-Weight Tear Tests on Line Pipe	4th	2014	G5I304	$95.00	10
RP	5L7	Recommended Practice for Unprimed Internal Fusion Bonded Epoxy Coating of Line Pipe	2nd	1988	G02906	$89.00	10

Pub	Number	Title	Edition	Date	Product Number	Price	Page(s)
RP	5L7	Recommended Practice for Unprimed Internal Fusion Bonded Epoxy Coating of Line Pipe—Russian	2nd	1988	G02906R	$72.00	10, 168
RP	5L8	Recommended Practice for Field Inspection of New Line Pipe	2nd	1996	G05L82	$125.00	10
RP	5L8	Recommended Practice for Field Inspection of New Line Pipe—Kazakh	2nd	1996	G05L82K	$100.00	10, 166
RP	5L8	Recommended Practice for Field Inspection of New Line Pipe—Russian	2nd	1996	G05L82R	$100.00	10, 168
RP	5L9	External Fusion Bonded Epoxy Coating of Line Pipe	1st	2001	G5L901	$79.00	10
RP	5L9	External Fusion Bonded Epoxy Coating of Line Pipe—Kazakh	1st	2001	G5L901K	$64.00	10, 166
RP	5L9	External Fusion Bonded Epoxy Coating of Line Pipe—Russian	1st	2001	G5L901R	$64.00	10, 168
Spec	5LC	CRA Line Pipe	4th	2015	G5LC04	$175.00	10
Spec	5LCP	Specification on Coiled Line Pipe	2nd	2006	G5LCP2	$146.00	11
Spec	5LCP	Specification on Coiled Line Pipe—Chinese	2nd	2006	G5LCP2C	$103.00	11, 163
Spec	5LD	CRA Clad or Lined Steel Pipe	4th	2015	G5LD04	$145.00	11
RP	5LT	Recommended Practice for Truck Transportation of Line Pipe	1st	2012	G5LT01	$59.00	11
RP	5LT	Recommended Practice for Truck Transportation of Line Pipe—Chinese	1st	2012	G5LT01C	$42.00	11, 163
RP	5LW	Recommended Practice for Transportation of Line Pipe on Barges and Marine Vessels	3rd	2009	G5LW03	$59.00	11
RP	5SI	Recommended Practice for Purchaser Representative Surveillance and/or Inspection at the Supplier	1st	2006	G5SI01	$57.00	11
Spec	5ST	Specification for Coiled Tubing—U.S. Customary and SI Units	1st	2010	G5ST01	$134.00	11
Spec	5ST	Specification for Coiled Tubing—U.S. Customary and SI Units—Chinese	1st	2010	G5ST01C	$94.00	11, 163
Std	5T1	Standard on Imperfection Terminology	10th	2003	G05T10	$115.00	11
TR	5TP	Torque-Position Assembly Guidelines for API Casing and Tubing Connections	1st	2013	G5TP01	$115.00	11
TR	5TRSR22	Technical Report in SR22 Supplementary Requirements for Enhanced Leak Resistance LTC	1st	2002	GSR221	$88.00	12
RP	5UE 11	Recommended Practice for Ultrasonic Evaluation of Pipe Imperfections	2nd	2005	G5UE02	$79.00	12
Spec	6A/ISO 10423:2009	Specification for Wellhead and Christmas Tree Equipment	20th	2010	GX06A20	$260.00	12
Spec	6A/ISO 10423:2009	Specification for Wellhead and Christmas Tree Equipment—Chinese	20th	2010	GX06A20C	$182.00	12, 163
Std	6ACRA	Age-Hardened Nickel-Based Alloys for Oil and Gas Drilling and Production Equipment	1st	2015	G6ACRA1	$90.00	12
TR	6AF	Technical Report on Capabilities of API Flanges Under Combinations of Load	3rd	2008	G6AF03	$150.00	12
TR	6AF1	Technical Report on Temperature Derating of API Flanges Under Combination of Loading	2nd	1998	G06AF1	$157.00	13
TR	6AF2	Technical Report on Capabilities of API Integral Flanges Under Combination of Loading—Phase II	5th	2013	G6AF25	$170.00	13
TR	6AM	Technical Report on Material Toughness	2nd	1995	G06AM2	$76.00	13
Spec	6AV1	Specification for Validation of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service	2nd	2013	G6AV102	$80.00	13
Spec	6AV1	Specification for Validation of Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service—Russian	2nd	2013	G6AV102R	$64.00	13, 168
Std	6AV2	Installation, Maintenance and Repair of Surface Safety Valves and Underwater Safety Valves Offshore	1st	2014	G6AV201	$135.00	13
Spec	6D	Specification for Pipeline and Piping Valves	24th	2014	G6D024	$150.00	13
Spec	6D	Specification for Pipeline and Piping Valves—Chinese	24th	2014	G6D024C	$105.00	13, 164
Spec	6D	Specification for Pipeline and Piping Valves—Russian	24th	2014	G6D024R	$120.00	13, 168
RP	6DR	Recommended Practice for the Repair and Remanufacture of Pipeline Valves	2nd	2012	G06DR2	$78.00	13
RP	6DR	Recommended Practice for the Repair and Remanufacture of Pipeline Valves—Russian	2nd	2012	G06DR2R	$63.00	13, 168
Spec	6DSS/ISO 14723:2009	Specification for Subsea Pipeline Valves	2nd	2009	GX6DSS2	$165.00	14
Spec	6DSS/ISO 14723:2009	Specification for Subsea Pipeline Valves—Chinese	2nd	2009	GX6DSS2C	$116.00	14, 164
Std	6DX/ISO 12490:2011	Standard for Actuator Sizing and Mounting Kits for Pipeline Valves	1st	2012	GG6DX01	$131.00	14
TR	6F1	Technical Report on Performance of API and ANSI End Connections in a Fire Test According to API Specification 6FA	3rd	1999	G06F13	$115.00	14
TR	6F2	Technical Report on Fire Resistance Improvements for API Flanges	3rd	1999	G06F23	$109.00	14
Spec	6FA	Specification for Fire Test for Valves	3rd	1999	G06FA3	$97.00	14
Spec	6FA	Specification for Fire Test for Valves—Russian	3rd	1999	G06FA3R	$78.00	14, 168
Spec	6FB	Specification for Fire Test for End Connections	3rd	1998	G06FB3	$109.00	14
Spec	6FD	Specification for Fire Test for Check Valves	1st	1995	G06FD1	$89.00	14
Spec	6FD	Specification for Fire Test for Check Valves—Russian	1st	1995	G06FD1R	$72.00	14, 168
RP	6HT	Heat Treatment and Testing of Carbon and Low Alloy Steel Large Cross Section and Critical Section Components	2nd	2013	G6HT02	$85.00	15
Bull	6J	Bulletin on Testing of Oilfield Elastomers—A Tutorial	1st	1992	G03230	$79.00	15
TR	6J1	Elastomer Life Estimation Testing Procedures	1st	2000	G06J11	$79.00	15

Pub	Number	Title	Edition	Date	Product Number	Price	Page(s)
TR	6MET	Metallic Material Limits for Wellhead Equipment Used in High Temperature for API 6A and 17D Applications	1st	2010	G6MET1	$98.00	15
Std	6X	Design Calculations for Pressure-Containing Equipment	1st	2014	G06X01	$60.00	15
Spec	7-1/ISO 10424-1:2004	Specification for Rotary Drill Stem Elements	1st	2006	GX7101	$162.00	15
Spec	7-1/ISO 10424-1:2004	Specification for Rotary Drill Stem Elements—Chinese	1st	2006	GX7101C	$114.00	15, 164
Spec	7-1/ISO 10424-1:2004	Specification for Rotary Drill Stem Elements—Spanish	1st	2006	GX7101SP	$162.00	15, 171
Spec	7-2	Threading and Gauging of Rotary Shouldered Connections	2nd	2017	GX70202	$190.00	15
Std	7CW	Casing Wear Tests	1st	2015	G7CW01	$85.00	16
Spec	7F	Oil Field Chain and Sprockets	8th	2010	G7F008	$116.00	16
Spec	7F	Oil Field Chain and Sprockets—Chinese	8th	2010	G7F008C	$82.00	16, 164
RP	7G	Recommended Practice for Drill Stem Design and Operating Limits	16th	1998	G07G6A	$194.00	16
RP	7G	Recommended Practice for Drill Stem Design and Operating Limits—Kazakh	16th	1998	G07G6AK	$156.00	16, 166
RP	7G	Recommended Practice for Drill Stem Design and Operating Limits—Russian	16th	2009	G07G6AR	$155.00	16, 168
RP	7G-2/ISO 10407-2:2008	Recommended Practice for Inspection and Classification of Drill Stem Element Inspection	1st	2009	GX7G201	$140.00	16
RP	7G-2/ISO 10407-2:2008	Recommended Practice for Inspection and Classification of Drill Stem Element Inspection—Spanish	1st	2009	GX7G201SP	$140.00	16, 171
RP	7HU1	Safe Use of 2-Inch Hammer Unions for Oilfield Applications	1st	2009	H7HU11	$37.00	16
Spec	7K	Drilling and Well Servicing Equipment	6th	2015	G07K06	$200.00	16
RP	7L	Procedures for Inspection, Maintenance, Repair, and Remanufacture of Drilling Equipment	1st	1995	G07L01	$109.00	17
Spec	7NRV	Specification for Drill String Non-Return Valves	1st	2006	G7NRV01	$70.00	17
Spec	7NRV	Specification for Drill String Non-Return Valves—Chinese	1st	2006	G7NRV01C	$49.00	17, 164
RP	8B	Recommended Practice for Procedures for Inspection, Maintenance, Repair, and Remanufacture of Hoisting Equipment	8th	2014	G08B08	$95.00	17
Spec	8C	Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)	5th	2012	GX08C05	$140.00	17
Spec	8C	Drilling and Production Hoisting Equipment (PSL 1 and PSL 2)—Chinese	5th	2012	GX08C05C	$98.00	17, 164
Spec	9A	Specification for Wire Rope	26th	2011	G9A026	$109.00	17
Spec	9A	Specification for Wire Rope—Chinese	26th	2011	G9A026C	$77.00	18, 164
RP	9B	Application, Care, and Use of Wire Rope for Oil Field Service	14th	2015	G9B014	$120.00	18
Spec	10A/ISO 10426-1:2009	Specification for Cements and Materials for Well Cementing	24th	2010	GX10A24	$145.00	18
RP	10B-2	Recommended Practice for Testing Well Cements	2nd	2013	G10B202	$220.00	18
RP	10B-3	Testing of Well Cements Used in Deepwater Well Construction	2nd	2016	G10B32	$95.00	18
RP	10B-4	Preparation and Testing of Foamed Cement Formulations at Atmospheric Pressure	2nd	2015	G10B402	$95.00	18
RP	10B-5/ISO 10426-5:2004	Recommended Practice on Determination of Shrinkage and Expansion of Well Cement Formulations at Atmospheric Pressure	1st	2005	GX10B501	$80.00	18
RP	10B-6/ISO 10426-6:2008	Recommended Practice on Determining the Static Gel Strength of Cement Formulations	1st	2010	GG10B601	$62.00	18
Spec	10D/ISO 10427-1:2001	Specification for Bow-Spring Casing Centralizers	6th	2002	GX10D06	$89.00	19
Spec	10D/ISO 10427-1:2001	Specification for Bow-Spring Casing Centralizers—Chinese	6th	2002	GX10D06C	$63.00	19, 164
RP	10D-2/ISO 10427-2:2004	Recommended Practice for Centralizer Placement and Stop Collar Testing	1st	2004	GG10D21	$77.00	19
RP	10F/ISO 10427-3:2003	Recommended Practice for Performance Testing of Cementing Float Equipment	3rd	2002	GX10F03	$64.00	19
TR	10TR1	Cement Sheath Evaluation	2nd	2008	G10TR12	$145.00	19
TR	10TR1	Cement Sheath Evaluation—Kazakh	2nd	2008	G10TR12K	$116.00	19, 166
TR	10TR1	Cement Sheath Evaluation—Russian	2nd	2008	G10TR12R	$116.00	19, 168
TR	10TR2	Shrinkage and Expansion in Oilwell Cements	1st	1997	G10TR2	$122.00	19
TR	10TR2	Shrinkage and Expansion in Oilwell Cements—Russian	1st	1997	G10TR2R	$97.00	19, 168
TR	10TR3	Technical Report on Temperatures for API Cement Operating Thickening Time Tests	1st	1999	G10TR3	$157.00	19
TR	10TR3	Technical Report on Temperatures for API Cement Operating Thickening Time Tests—Russian	1st	1999	G10TR3R	$125.00	19, 168
TR	10TR4	Selection of Centralizers for Primary Cementing Operations	1st	2008	G10TR40	$61.00	19
TR	10TR4	Selection of Centralizers for Primary Cementing Operations—Kazakh	1st	2008	G10TR40K	$49.00	19, 166
TR	10TR4	Selection of Centralizers for Primary Cementing Operations—Russian	1st	2008	G10TR40R	$48.00	19, 168
TR	10TR5	Methods for Testing of Solid and Rigid Centralizers	1st	2008	G10TR50	$61.00	19
TR	10TR5	Methods for Testing of Solid and Rigid Centralizers—Kazakh	1st	2008	G10TR50K	$49.00	20, 166

Pub	Number	Title	Edition	Date	Product Number	Price	Page(s)
TR	10TR5	Methods for Testing of Solid and Rigid Centralizers—Russian	1st	2008	G10TR50R	$48.00	20, 168
TR	10TR6	Evaluation and Testing of Mechanical Cement Wiper Plugs	1st	2015	G10TR601	$90.00	20
RP	11AR	Recommended Practice for Care and Use of Subsurface Pumps	4th	2000	G11AR4	$124.00	20
Spec	11AX	Specification for Subsurface Sucker Rod Pump Assemblies, Components, and Fittings	13th	2015	G11AX13	$175.00	20
Spec	11B	Specification for Sucker Rods, Polished Rods and Liners, Couplings, Sinker Bars, Polished Rod Clamps, Stuffing Boxes, and Pumping Tees	27th	2010	G11B27	$155.00	20
Spec	11B	Specification for Sucker Rods, Polished Rods and Liners, Couplings, Sinker Bars, Polished Rod Clamps, Stuffing Boxes, and Pumping Tees—Chinese	27th	2010	G11B27C	$109.00	21, 164
RP	11BR	Recommended Practice for the Care and Handling of Sucker Rods	9th	2008	G11BR09	$105.00	21
RP	11BR	Recommended Practice for the Care and Handling of Sucker Rods—Chinese	9th	2008	G11BR09C	$74.00	21, 164
Spec	11D1/ISO 14310:2008	Packers and Bridge Plugs	3rd	2015	G11D103	$115.00	36
Std	11D3/ISO 15136-2:2006	Progressing Cavity Pump Systems for Artificial Lift—Surface-Drive Systems	1st	2008	G11D301	$106.00	21
Spec	11E	Specification for Pumping Units	19th	2013	G11E019	$170.00	21
Spec	11E	Specification for Pumping Units—Chinese	19th	2013	G11E019C	$119.00	21, 164
RP	11ER	Recommended Practice for Guarding of Pumping Units	3rd	2009	G11ER03	$80.00	21
RP	11G	Recommended Practice for Installation, Maintenance and Lubrication of Pumping Units	5th	2013	G11G05	$85.00	21
TR	11L	Design Calculations for Sucker Rod Pumping Systems (Conventional Units)	5th	2008	G11L05	$106.00	21
Bull	11L2	Bulletin on Catalog of Analog Computer Dynamometer Cards	1st	1969	G05700	$122.00	21
Bull	11L3	Sucker Rod Pumping System Design Book	1st	1970	G05800	$132.00	21
TR	11L6	Technical Report on Electric Motor Prime Mover for Beam Pumping Unit Service	2nd	2008	G11L602	$86.00	22
TR	11L6	Technical Report on Electric Motor Prime Mover for Beam Pumping Unit Service—Chinese	2nd	2008	G11L602C	$61.00	22, 164
RP	11S	Recommended Practice for the Operation, Maintenance and Troubleshooting of Electric Submersible Pump Installations	3rd	1994	G11S03	$83.00	22
RP	11S1	Recommended Practice for Electrical Submersible Pump Teardown Report	3rd	1997	G11S13	$122.00	22
RP	11S2	Recommended Practice for Electric Submersible Pump Testing	2nd	1997	G11S22	$83.00	22
RP	11S2	Recommended Practice for Electric Submersible Pump Testing—Russian	2nd	1997	G11S22R	$67.00	22, 168
RP	11S3	Recommended Practice for Electrical Submersible Pump Installations	2nd	1999	G11S32	$89.00	22
RP	11S3	Recommended Practice for Electrical Submersible Pump Installations—Russian	2nd	1999	G11S32R	$72.00	22, 168
RP	11S4	Recommended Practice for Sizing and Selection of Electric Submersible Pump Installations	3rd	2002	G11S43	$79.00	22
RP	11S5	Recommended Practice for the Application of Electrical Submersible Cable Systems	2nd	2008	G11S52	$109.00	22
RP	11S6	Recommended Practice for Testing of Electric Submersible Pump Cable Systems	1st	1995	G11S61	$89.00	22
RP	11S7	Recommended Practice on Application and Testing of Electric Submersible Pump Seal Chamber Sections	1st	1993	G05947	$89.00	23
RP	11S8	Recommended Practice on Electric Submersible System Vibrations	2nd	2012	G11S802	$78.00	23
RP	11V5	Recommended Practices for Operation, Maintenance, Surveillance, and Troubleshooting of Gas-Lift Installations	3rd	2008	G11V53	$155.00	36
RP	11V6	Recommended Practice for Design of Continuous Flow Gas Lift Installations Using Injection Pressure Operated Valves	2nd	1999	G11V62	$149.00	37
RP	11V8	Recommended Practice for Gas Lift System Design and Performance Prediction	1st	2003	G11V81	$119.00	37
Spec	12B	Specification for Bolted Tanks for Storage of Production Liquids	16th	2014	G12B156	$120.00	23, 94
Spec	12D	Specification for Field Welded Tanks for Storage of Production Liquids	11th	2008	G12D11	$97.00	23, 94
Spec	12D	Specification for Field Welded Tanks for Storage of Production Liquids—Chinese	11th	2008	G12D11C	$68.00	23, 94, 164
Spec	12F	Specification for Shop Welded Tanks for Storage of Production Liquids	12th	2008	G12F12	$97.00	23, 94
Spec	12F	Specification for Shop Welded Tanks for Storage of Production Liquids—Chinese	12th	2008	G12F12C	$68.00	23, 94, 164
Spec	12J	Specification for Oil and Gas Separators	8th	2008	G12J08	$97.00	23
Spec	12J	Specification for Oil and Gas Separators—Chinese	8th	2008	G12J08C	$68.00	23, 164
Spec	12J	Specification for Oil and Gas Separators—Russian	8th	2008	G12J08R	$78.00	23, 168
Spec	12K	Specification for Indirect Type Oilfield Heaters	8th	2008	G12K08	$115.00	24
Spec	12K	Specification for Indirect Type Oilfield Heaters—Chinese	8th	2008	G12K08C	$81.00	24, 164
Spec	12L	Specification for Vertical and Horizontal Emulsion Treaters	5th	2008	G12L05	$97.00	24
RP	12N	Recommended Practice for the Operation, Maintenance and Testing of Firebox Flame Arrestors	2nd	1994	G12N02	$83.00	24
Spec	12P	Specification for Fiberglass Reinforced Plastic Tanks	4th	2016	G12P04	$108.00	24, 94
RP	12R1	Recommended Practice for Setting, Maintenance, Inspection, Operation, and Repair of Tanks in Production Service	5th	1997	G12R15	$132.00	24, 94
Spec	13A/ISO 13500:2009	Specification for Drilling Fluid Materials	18th	2010	GX13A018	$181.00	24
Spec	13A/ISO 13500:2009	Specification for Drilling Fluid Materials—Chinese	18th	2010	GX13A018C	$127.00	24, 164

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Pub	Number	Title	Edition	Date	Product Number	Price	Page(s)
RP	13B-1/ISO 10414-1:2008	Recommended Practice for Field Testing Water-Based Drilling Fluids	4th	2009	GX13B14	$165.00	25
RP	13B-2	Recommended Practice for Field Testing Oil-Based Drilling Fluids	5th	2014	G13B205	$205.00	25
RP	13C	Recommended Practice on Drilling Fluid Processing Systems Evaluation	5th	2014	G13C05	$135.00	25
RP	13D	Rheology and Hydraulics of Oil-Well Fluids	6th	2010	G13D06	$134.00	25
RP	13D	Rheology and Hydraulics of Oil-Well Fluids—Kazakh	6th	2010	G13D06K	$108.00	25, 166
RP	13D	Rheology and Hydraulics of Oil-Well Fluids—Russian	6th	2010	G13D06R	$108.00	25, 168
RP	13I/ISO 10416:2008	Recommended Practice for Laboratory Testing of Drilling Fluids	8th	2009	GX13I8	$186.00	25
RP	13J	Testing of Heavy Brines	5th	2014	G13J05	$130.00	25
RP	13K	Recommended Practice for Chemical Analysis of Barite	3rd	2011	G13K03	$107.00	26
RP	13K	Recommended Practice for Chemical Analysis of Barite—Kazakh	3rd	2011	G13K03K	$86.00	26, 166
RP	13K	Recommended Practice for Chemical Analysis of Barite—Russian	3rd	2011	G13K03R	$86.00	26, 169
RP	13L	Recommended Practice for Training and Qualification of Drilling Fluid Technologists	1st	2003	G13L01	$53.00	26
RP	13M/ISO 13503-1:2003	Recommended Practice for the Measurement of Viscous Properties of Completion Fluids	1st	2004	GX13M01	$98.00	26
RP	13M-4/ISO 13503-4:2006	Recommended Practice for Measuring Stimulation and Gravel-Pack Fluid Leakoff Under Static Conditions	1st	2006	GG13M41	$57.00	26
Spec	14A	Specification for Subsurface Safety Valve Equipment	12th	2015	G14A12	$225.00	26
RP	14B	Design, Installation, Operation, Test, and Redress of Subsurface Safety Valve Systems	6th	2015	G14B06	$126.00	26
RP	14C	Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms	7th	2001	G14C07	$201.00	26
RP	14E	Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems	5th	1991	G07185	$149.00	26
RP	14E	Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems—Chinese	5th	1991	811-07185 CN940	$105.00	27, 164
RP	14F	Design, Installation, and Maintenance of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Division 1, and Division 2 Locations	5th	2008	G14F05	$119.00	27
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	2nd	2013	G14FZ02	$280.00	27
RP	14G	Recommended Practice for Fire Prevention and Control on Fixed Open-Type Offshore Production Platforms	4th	2007	G14G04	$124.00	27
RP	14J	Recommended Practice for Design and Hazards Analysis for Offshore Production Facilities	2nd	2001	G14J02	$117.00	27
Spec	14L/ISO 16070:2005	Specification for Lock Mandrels and Landing Nipples	2nd	2007	GG14L02	$119.00	27
Spec	14L/ISO 16070:2005	Specification for Lock Mandrels and Landing Nipples—Chinese	2nd	2007	GX14L02C	$84.00	27, 164
RP	15CLT	Recommended Practice for Composite Lined Steel Tubular Goods	1st	2007	G15CLT1	$83.00	28
Spec	15HR	High-Pressure Fiberglass Line Pipe	4th	2016	G15HR4	$110.00	28
Spec	15LE	Specification for Polyethylene Line Pipe (PE)	4th	2008	G15LE4	$101.00	28
Spec	15LE	Specification for Polyethylene Line Pipe (PE)—Chinese	4th	2008	G15LE4C	$71.00	28, 164
Spec	15LR	Specification for Low Pressure Fiberglass Line Pipe	7th	2001	G15LR7	$97.00	28
Spec	15LR	Specification for Low Pressure Fiberglass Line Pipe—Chinese	7th	2001	G15LR7C	$68.00	28, 165
RP	15S	Spoolable Reinforced Plastic Line Pipe	2nd	2016	G15S02	$125.00	28
RP	15TL4	Recommended Practice for Care and Use of Fiberglass Tubulars	2nd	1999	G15TL4	$97.00	28
Spec	16A/ISO 13533:2001	Specification for Drill-Through Equipment	3rd	2004	GX16A03	$165.00	28
Spec	16A/ISO 13533:2001	Specification for Drill-Through Equipment—Chinese	3rd	2004	GX16A03C	$116.00	29, 165
Spec	16C	Choke and Kill Equipment	2nd	2015	G16C02	$150.00	29
Spec	16D	Specification for Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment	2nd	2004	G16D02	$177.00	29
Spec	16D	Specification for Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment—Chinese	2nd	2004	G16D02C	$124.00	29, 165
Spec	16D	Specification for Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment—Kazakh	2nd	2004	G16D02K	$142.00	29, 166
Spec	16D	Specification for Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment—Russian	2nd	2004	G16D02R	$141.00	29, 169
Spec	16F	Specification for Marine Drilling Riser Equipment	1st	2004	G16F01	$119.00	29
RP	16Q	Recommended Practice for Design, Selection, Operation and Maintenance of Marine Drilling Riser Systems	1st	1993	G07249	$109.00	30
Spec	16R	Specification for Marine Drilling Riser Couplings	1st	1997	G16R01	$97.00	30

Pub	Number	Title	Edition	Date	Product Number	Price	Page(s)
Spec	16R	Specification for Marine Drilling Riser Couplings—Chinese	1st	1997	G16R01C	$68.00	30, 165
Spec	16RCD	Specification for Drill Through Equipment—Rotating Control Devices	2nd	2015	G16RCD01	$155.00	30
RP	16ST	Coiled Tubing Well Control Equipment Systems	1st	2009	G16ST01	$145.00	30
RP	17A/ISO 13628-1:2005	Design and Operation of Subsea Production Systems—General Requirements and Recommendations	4th	2006	GX17A04	$182.00	31
RP	17B	Recommended Practice for Flexible Pipe	5th	2014	G017B05	$230.00	31
Spec	17D/ISO 13628-4	Design and Operation of Subsea Production Systems—Subsea Wellhead and Tree Equipment	2nd	2011	GX17D02	$186.00	31
Spec	17D/ISO 13628-4	Design and Operation of Subsea Production Systems—Subsea Wellhead and Tree Equipment—Chinese	2nd	2011	GX17D02C	$131.00	31, 165
Spec	17E/ISO 13628-5:2009	Specification for Subsea Umbilicals	4th	2010	GX17E04	$194.00	32
Spec	17F	Standard for Subsea Production Control Systems	3rd	2014	G017F03	$220.00	32
RP	17G/ISO 13628-7:2005	Recommended Practice for Completion/Workover Riser	2nd	2006	GX17G02	$182.00	32
RP	17H	Remotely Operated Tools and Interfaces on Subsea Production Systems	2nd	2013	G17H02	$160.00	32
Spec	17J	Specification for Unbonded Flexible Pipe	4th	2014	G017J04	$135.00	32
Spec	17K/ISO 13628-10:2005	Specification for Bonded Flexible Pipe	2nd	2005	GX17K02	$151.00	32
Spec	17L1	Specification for Flexible Pipe Ancillary Equipment	1st	2013	G17L101	$170.00	33
RP	17L2	Recommended Practice for Flexible Pipe Ancillary Equipment	1st	2013	G17L201	$170.00	33
RP	17N	Recommended Practice for Subsea Production System Reliability and Technical Risk Management	1st	2009	G17N01	$178.00	33
RP	17O	Recommended Practice for Subsea High Integrity Pressure Protection Systems (HIPPS)	2nd	2014	G17O02	$120.00	33
RP	17P/ISO 13628-15:2011	Design and Operation of Subsea Production Systems—Subsea Structures and Manifolds	1st	2013	GG17P01	$150.00	33
RP	17Q	Subsea Equipment Qualification—Standardized Process for Documentation	1st	2010	G17Q01	$134.00	34
RP	17R	Recommended Practice for Flowline Connectors and Jumpers	1st	2015	G17R01	$120.00	34
RP	17S	Recommended Practice for the Design, Testing, and Operation of Subsea Multiphase Flow Meters	1st	2015	G17S01	$85.00	34
TR	17TR1	Evaluation Standard for Internal Pressure Sheath Polymers for High Temperature Flexible Pipes	1st	2003	G17TR11	$132.00	34
TR	17TR2	The Aging of PA-11 In Flexible Pipes	1st	2003	G17TR21	$101.00	34
TR	17TR3	An Evaluation of the Risks and Benefits of Penetrations in Subsea Wellheads Below the BOP Stack	1st	2004	G17TR31	$132.00	34
TR	17TR4	Subsea Equipment Pressure Ratings	2nd	2016	G17TR402	$65.00	34
TR	17TR5	Avoidance of Blockages in Subsea Production Control and Chemical Injection Systems	1st	2012	G17TR501	$98.00	35
TR	17TR6	Attributes of Production Chemicals in Subsea Production Systems	1st	2012	G17TR601	$98.00	35
TR	17TR8	High-Pressure High-Temperature Design Guidelines	1st	2015	G17TR81	$120.00	35
TR	17TR10	Subsea Umbilical Termination (SUT) Design Recommendations	1st	2015	G17TR101	$104.00	35
TR	17TR11	Pressure Effects on Subsea Hardware During Flowline Pressure Testing in Deep Water	1st	2015	G17TR111	$80.00	35
TR	17TR12	Consideration of External Pressure in the Design and Pressure Rating of Subsea Equipment	1st	2015	G17TR121	$95.00	35
TR	17TR13	General Overview of Subsea Production Systems	1st	2016	G17TR131	$120.00	36
RP	17U	Recommended Practice for Wet and Dry Thermal Insulation of Subsea Flowlines and Equipment	1st	2015	G17U01	$75.00	36
RP	17V	Recommended Practice for Analysis, Design, Installation, and Testing of Safety Systems for Subsea Applications	1st	2015	G17V01	$140.00	36
RP	17W	Recommended Practice for Subsea Capping Stacks	1st	2014	G17W01	$125.00	36
TR	18TR1	Guidance on Changes to API Q1, Ninth Edition	1st	2015	G18TR101	$65.00	2
Spec	19AC/ISO 14998:2013	Specification for Completion Accessories	1st	2016	G19AC01	$112.00	37
RP	19B	Recommended Practice for Evaluation of Well Perforators	2nd	2006	G019B2	$122.00	37
RP	19B	Recommended Practice for Evaluation of Well Perforators—Chinese	2nd	2006	G019B2C	$86.00	37, 165
RP	19B	Recommended Practice for Evaluation of Well Perforators—Kazakh	2nd	2006	G019B2K	$98.00	37, 166
RP	19B	Recommended Practices for Evaluation of Well Perforators—Russian	2nd	2006	G019B2R	$97.00	37, 169
RP	19C/ISO 13503-2:2006	Measurement of Properties of Proppants Used in Hydraulic Fracturing and Gravel-Packing Operations	1st	2008	GX19C01	$113.00	37
RP	19D/ISO 13503-5:2006	Measuring the Long-Term Conductivity of Proppants	1st	2008	GX19D01	$107.00	37
Spec	19G1/ISO 17078-1:2004	Side-Pocket Mandrels	1st	2010	GG19G11	$103.00	38
Spec	19G1/ISO 17078-1:2004	Side-Pocket Mandrels—Chinese	1st	2010	GG19G101C	$73.00	38, 165
Spec	19G2/ISO 17078-2:2007	Flow-Control Devices for Side-Pocket Mandrels	1st	2010	GX19G21	$155.00	38

Publications by Number

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RP	19G4/ISO 17078-4:2010	Practices for Side-Pocket Mandrels and Related Equipment	1st	2011	GG19G401	$155.00	38
RP	19G9	Design, Operation, and Troubleshooting of Dual Gas-Lift Wells	2nd	2015	G19G92	$165.00	38
Spec	19TT	Specification for Downhole Well Test Tools and Related Equipment	1st	2016	G19TT01	$132.00	38
Spec	19V/ISO 28781:2010	Subsurface Barrier Valves and Related Equipment	1st	2013	GG19V01	$150.00	39
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Std	20D	Nondestructive Examination Services for Equipment Used in the Petroleum and Natural Gas Industry	1st	2013	G20D01	$85.00	39
Spec	20E	Alloy and Carbon Steel Bolting for Use in the Petroleum and Natural Gas Industries	1st	2012	G20E01	$74.00	39
Spec	20F	Corrosion Resistant Bolting for Use in the Petroleum and Natural Gas Industries	1st	2015	G20F01	$75.00	39
Std	20H	Heat Treatment Services—Batch Type for Equipment Used in the Petroleum and Natural Gas Industry	1st	2015	G20H01	$65.00	40
RP	31A	Standard Form for Hardcopy Presentation of Downhole Well Log Data	1st	1997	G31A01	$97.00	40
RS	032	An Empirical Analysis of the Determinants of Petroleum Drilling		1983			159
RP	45	Recommended Practice for Analysis of Oilfield Waters	3rd	1998	G45003	$142.00	40
RP	49	Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide	3rd	2001	G49003	$88.00	44, 115
RP	49	Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide—Kazakh	3rd	2001	G4903K	$71.00	44, 115, 166
RP	49	Recommended Practice for Drilling and Well Servicing Operations Involving Hydrogen Sulfide—Russian	3rd	2001	G04903R	$68.00	44, 115, 169
RP	50	Natural Gas Processing Plant Practices for Protection of the Environment	2nd	1995	G50002	$109.00	40
RS	051	The Use of Economic Incentive Mechanisms in Environmental Management		1990			159
RP	51	Onshore Oil and Gas Production Practices for Protection of the Environment	3rd	2001	G51003	$51.00	40
RP	51R	Environmental Protection for Onshore Oil and Gas Production Operations and Leases	1st	2009	G51R01	$76.00	40, 44, 115
RP	52	Land Drilling Practices for Protection of the Environment	2nd	1995	G52002	$115.00	40
RS	053	Reducing Emissions from Older Vehicles		1990			159
DR	53	Characterization of Exploration and Production Associated Wastes		1996	I00053	$136.00	154
Std	53	Blowout Prevention Equipment Systems for Drilling Wells	4th	2012	G05304	$155.00	30
Std	53	Blowout Prevention Equipment Systems for Drilling Wells—Kazakh	4th	2012	G05304K	$124.00	30, 166
RP	54	Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations	3rd	1999	G54003	$125.00	44, 116
RP	54	Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations—Kazakh	3rd	1999	G54003K	$100.00	45, 116, 167
RP	54	Recommended Practice for Occupational Safety for Oil and Gas Well Drilling and Servicing Operations—Russian	3rd	1999	G54003R	$100.00	45, 116, 169
RP	55	Recommended Practice for Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulfide	2nd	1995	G55002	$115.00	45, 116
RS	056	Economics of Alternative Fuel Use: Compressed Natural Gas as a Vehicle Fuel		1990			159
RP	59	Recommended Practice for Well Control Operations	2nd	2006	G59002	$122.00	30
RP	59	Recommended Practice for Well Control Operations—Kazakh	2nd	2006	G59002K	$98.00	30, 167
RP	59	Recommended Practice for Well Control Operations—Russian	2nd	2006	G59002R	$97.00	30, 169
RS	064	U.S. Petroleum Supply: History, Prospects, and Policy Implications		1992			159
RP	64	Recommended Practice for Diverter Systems Equipment and Operations	2nd	2001	G64002	$107.00	31
RP	64	Recommended Practice for Diverter Systems Equipment and Operations—Kazakh	2nd	2001	G64002K	$86.00	31, 167
RP	64	Recommended Practice for Diverter Systems Equipment and Operations—Russian	2nd	2001	G64002R	$85.00	31, 169
RP	65	Cementing Shallow Water Flow Zones in Deepwater Wells	1st	2002	G56001	$121.00	20
RP	65	Cementing Shallow Water Flow Zones in Deepwater Wells—Kazakh	1st	2002	G56001K	$97.00	20, 167
RP	65	Cementing Shallow Water Flow Zones in Deepwater Wells—Russian	1st	2002	G56001R	$96.00	20, 169
Std	65-2	Isolating Potential Flow Zones During Well Construction	2nd	2010	G65202	$130.00	20, 116
RS	067	The Cost Effectiveness of Vehicle Inspection and Maintenance Programs		1993			160
RP	67	Recommended Practice for Oilfield Explosives Safety	2nd	2007	G06702	$85.00	45, 116
RP	67	Recommended Practice for Oilfield Explosives Safety—Kazakh	2nd	2007	G06702K	$68.00	45, 116, 167
RP	67	Recommended Practice for Oilfield Explosives Safety—Russian	2nd	2007	G06702R	$69.00	45, 116, 169

Publications by Number

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RP	70	Security for Offshore oil and Natural Gas Operations	1st	2003	G07001	$57.00	47
RP	70I	Security for Worldwide Offshore Oil and Natural Gas Operations	1st	2004	G70I03	$61.00	47
DP	074	Current Status of Watershed Management in the United States		1993	see listing		159
RS	074	Air Emissions Banking and Trading: Analysis and Implications for Wetland Mitigation Banking		1994	see listing		160
RP	74	Recommended Practice for Occupational Safety for Onshore Oil and Gas Production Operation	1st	2001	G74001	$61.00	45, 116
RS	075	Improving Cost-Effectiveness Estimation: A Reassessment of Control Options to Reduce Ozone Precursor Emissions		1994	see listing		160
RP	75	Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities	3rd	2004	G07503	$89.00	45, 116, 141
RP	75	Recommended Practice for Development of a Safety and Environmental Management Program for Offshore Operations and Facilities—Chinese	3rd	2004	G07503C	$63.00	45, 116, 142, 165
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	1st	2007	G75L01	$34.00	45, 116
DR	76	Determination of Emissions from Retail Gasoline Outlets Using Optical Remote Sensing: Pilot Field Study at a Non-Vapor Recovery Site, Project Summary Report, Volume I		1999	I00076	$122.00	125
RS	076	Paying for Automobile Insurance at the Pump: A Critical Review		1994	see listing		160
RP	76	Contractor Safety Management for Oil and Gas Drilling and Production Operations	2nd	2007	G07602	$57.00	45, 117
DP	077	Alternative Wetland Mitigation Programs		1995	see listing		159
RP	80	Guidelines for the Definition of Onshore Gas Gathering Lines	1st	2000	G80001	$125.00	40
DP	081	Are We Running Out of Oil?		1995	see listing		159
RS	082	Superfund Liability and Taxes: Petroleum Industry Shares in Their Historical Context		1996	see listing		160
DP	084R	Analysis of the Costs and Benefits of Regulations: Review of Historical Experience		1996	see listing		159
RP	85	Use of Subsea Wet-Gas Flowmeters in Allocation Measurement Systems	1st	2003	G08501	$123.00	69
DP	086	Opposition to OCS Development, Historical Context and Economic Considerations		1996	see listing		159
RP	87	Recommended Practice for Field Analysis of Crude Oil Samples Containing from Two to Fifty Percent Water by Volume	1st	2007	G08701	$90.00	70
DP	088	Restoring Natural Resources: Legal Background and Economic Analysis		1997	see listing		159
RP	90	Annular Casing Pressure Management for Offshore Wells	1st	2006	G09001	$182.00	41
RP	90-2	Annular Casing Pressure Management for Onshore Wells	1st	2016	G090201	$182.00	41
Bull	91	Planning and Conducting Surface Preparation and Coating Operations for Oil and Natural Gas Drilling and Production Facilities in a Marine Environment	1st	2007	G09101	$61.00	27
Bull	92L	Drilling Ahead Safely With Lost Circulation in the Gulf of Mexico	1st	2015	G92L01	$70.00	41
RP	92U	Underbalanced Drilling Operations	1st	2008	G92U01	$105.00	41
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RP	95J	Gulf of Mexico Jackup Operations for Hurricane Season	1st	2006	G95J01	$62.00	7
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RP	100-2	Managing Environmental Aspects Associated With Exploration and Production Operations Including Hydraulic Fracturing	1st	2015	G100201	$90.00	43
Bull	100-3	Community Engagement Guidelines	1st	2014	G100301	$60.00	43
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Publ	317	Industry Experience with Pollution Prevention Programs		1993	see listing		135
Publ	322	An Engineering Evaluation of Acoustic Methods of Leak Detection in Aboveground Storage Tanks		1994	J32200	$74.00	142
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TR	401	Toluene: The Effect on Pregnancy of the Rat		1993	I00401	$87.00	132
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TR	403	Closed-Patch Repeated Insult Dermal Sensitization Study of TAME in Guinea Pigs		1995	I00403	$61.00	133
TR	404	An Inhalation Oncogenicity Study of Commercial Hexane in Rats and Mice, Part I—Rats		1995	I00404	$79.00	133
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TR	406	TAME-Acute Toxicity to Daphnids Under Flow-Through Conditions		1995	I00406	$61.00	145
TR	407	TAME-Acute Toxicity to Mysid Shrimp (Mysidopsis bahia) Under Static Renewal Conditions		1995	I00407	$61.00	145
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TR	410	Chromosome Aberrations in Chinese Hamster Ovary (CHO) Cells Exposed to Tertiary Amyl Methyl Ether (TAME)		1996	I00410	$87.00	133
TR	411	Chinese Hamster Ovary (CHO) HGPRT Mutation Assay of Tertiary Amyl Methyl Ether (TAME)		1996	I00411	$87.00	133
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	$97.00	133

Pub	Number	Title	Edition	Date	Product Number	Price	Page(s)
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TR	425	Options for Minimizing Environmental Impacts of Inland Spill Response		2016	see listing		147
RP	500	Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2	3rd	2012	C50003	$279.00	102
RP	500	Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2—Kazakh	3rd	2012	C50003K	$224.00	101, 167
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	1st	1997	C50501	$203.00	101
API	510	Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration	10th	2014	C51010	$225.00	87
API	510	Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration—Chinese	10th	2014	C51010C	$158.00	87, 165
API	510	Pressure Vessel Inspection Code: In-Service Inspection, Rating, Repair, and Alteration—Spanish	10th	2014	C51010S	$225.00	87, 171
Std	520, Part I	Sizing, Selection, and Installation of Pressure-Relieving Devices—Part I—Sizing and Selection	9th	2014	C520109	$340.00	97
Std	520, Part I	Sizing, Selection, and Installation of Pressure-Relieving Devices—Part I—Sizing and Selection—Russian	9th	2014	C520109R	$272.00	97, 169
RP	520, Part II	Sizing, Selection, and Installation of Pressure-Relieving Devices—Part II—Installation	6th	2015	C520206	$260.00	97
Std	521	Pressure-Relieving and Depressuring Systems	6th	2014	C52106	$275.00	97
Std	526	Flanged Steel Pressure-Relief Valves	6th	2009	C52606	$156.00	97
Std	526	Flanged Steel Pressure-Relief Valves—Russian	6th	2009	C52606R	$125.00	98, 169
Std	527	Seat Tightness of Pressure Relief Valves	4th	2014	C52704	$90.00	98
Std	530	Calculation of Heater-Tube Thickness in Petroleum Refineries	7th	2015	C53007	$290.00	102
RP	534	Heat Recovery Steam Generators	2nd	2007	C53402	$95.00	102
RP	535	Burners for Fired Heaters in General Refinery Services	3rd	2014	C53503	$150.00	103
RP	536	Post Combustion NOx Control for Fired Equipment in General Refinery Services	2nd	2006	C53602	$97.00	103
Std	537/ISO 25457:2008	Flare Details for General Refinery and Petrochemical Service	2nd	2008	CX53702	$217.00	103
Std	537/ISO 25457:2008	Flare Details for General Refinery and Petrochemical Service—Chinese	2nd	2008	C53702C	$152.00	103, 165
RP	538	Industrial Fired Boilers for General Refinery and Petrochemical Service	1st	2015	C53801	$305.00	103
RP	540	Electrical Installations in Petroleum Processing Plants	4th	1999	C54004	$188.00	102
Std	541	Form-Wound Squirrel Cage Induction Motors—375 kW (500 Horsepower) and Larger	5th	2014	C54105	$190.00	102
RP	545	Recommended Practice for Lightning Protection of Aboveground Storage Tanks for Flammable or Combustible Liquids	1st	2009	C54501	$101.00	102
TR	545-A	Verification of Lightning Protection Requirements for Above Ground Hydrocarbon Storage Tanks	1st	2009	CLP2009	$134.00	102
Std	546	Brushless Synchronous Machines—500 kVA and Larger	3rd	2008	C54603	$208.00	102
Std	547	General-Purpose Form-Wound Squirrel Cage Induction Motors—250 Horsepower and Larger	1st	2005	C54701	$94.00	102
RP	551	Process Measurement Instrumentation	2nd	2016	C55102	$157.00	104
RP	552	Transmission Systems	1st	1994	C55201	$109.00	104
RP	553	Refinery Valves and Accessories for Control and Safety Instrumented Systems	2nd	2012	C55302	$145.00	104
RP	554, Part 1	Process Control Systems, Part 1—Process Control Systems Functions and Functional Specification Development	2nd	2007	C55402	$139.00	104
RP	554, Part 1	Process Control Systems, Part 1—Process Control Systems Functions and Functional Specification Development—Russian	2nd	2007	C55402R	$112.00	104, 169
RP	554, Part 2	Process Control Systems, Part 2—Process Control System Design	1st	2008	C554201	$139.00	104
RP	554, Part 2	Process Control Systems, Part 2—Process Control System Design—Russian	1st	2008	C554201R	$112.00	104, 169
RP	554, Part 3	Process Control Systems, Part 3—Project Execution and Process Control System Ownership	1st	2008	C554301	$107.00	104
API	555	Process Analyzers	3rd	2013	C55503	$190.00	105
RP	556	Instrumentation, Control, and Protective Systems for Gas Fired Heaters	2nd	2011	C55602	$152.00	105
RP	556	Instrumentation, Control, and Protective Systems for Gas Fired Heaters—Russian	2nd	2011	C55602R	$122.00	105, 169
RP	557	Guide to Advanced Control Systems	2nd	2013	C55702	$110.00	105
Std	560	Fired Heaters for General Refinery Service	5th	2016	C56005	$335.00	103
API	570	Piping Inspection Code: In-Service Inspection, Rating, Repair, and Alteration of Piping Systems	4th	2016	C57004	$180.00	87, 98
RP	571	Damage Mechanisms Affecting Fixed Equipment in the Refining Industry	2nd	2011	C57102	$329.00	87, 106
RP	571	Damage Mechanisms Affecting Fixed Equipment in the Refining Industry—Chinese	2nd	2011	C57102C	$231.00	87, 106, 165
RP	572	Inspection Practices for Pressure Vessels	4th	2016	C57204	$230.00	87
RP	573	Inspection of Fired Boilers and Heaters	3rd	2013	C57303	$150.00	87, 103
RP	574	Inspection Practices for Piping System Components	4th	2016	C57404	$210.00	87, 98
RP	575	Inspection Practices for Atmospheric and Low-Pressure Storage Tanks	3rd	2014	C57503	$190.00	88
RP	575	Inspection Practices for Atmospheric and Low-Pressure Storage Tanks—Chinese	3rd	2014	C57503C	$133.00	88, 165
RP	576	Inspection of Pressure-Relieving Devices	3rd	2009	C57603	$134.00	88, 98

Pub	Number	Title	Edition	Date	Product Number	Price	Page(s)
RP	576	Inspection of Pressure-Relieving Devices—Chinese	3rd	2009	C57603C	$94.00	88, 98, 165
RP	577	Welding Processes, Inspection, and Metallurgy	2nd	2013	C57702	$225.00	88
RP	577	Welding Processes, Inspection, and Metallurgy—Chinese	2nd	2013	C57702 CN1420	$158.00	88, 165
RP	578	Material Verification Program for New and Existing Alloy Piping Systems	2nd	2010	C57802	$129.00	88, 98
RP	578	Material Verification Program for New and Existing Alloy Piping Systems—Chinese	2nd	2010	C57802C	$91.00	88, 99, 165
RP	578	Material Verification Program for New and Existing Alloy Piping Systems—Russian	2nd	2010	C57802R	$91.00	88, 99, 169
API	579-1/ASME FFS-1	Fitness-For-Service	3rd	2016	see listing		88
API	579-2/ASME FFS-2	Fitness-For-Service Example Problem Manual	1st	2009	C57921	$155.00	89
RP	580	Risk-Based Inspection	3rd	2016	C58003	$265.00	89
RP	581	Risk-Based Inspection Technology	3rd	2016	see listing		89
RP	582	Welding Guidelines for the Chemical, Oil, and Gas Industries	3rd	2016	C58203	$137.00	89, 106
RP	583	Corrosion Under Insulation and Fireproofing	1st	2014	C58301	$170.00	90
RP	584	Integrity Operating Windows	1st	2014	C58401	$120.00	90
RP	585	Pressure Equipment Integrity Incident Investigation	1st	2014	C58501	$125.00	90
RP	591	Process Valve Qualification Procedure	5th	2014	C59105	$100.00	99
Std	594	Check Valves: Flanged, Lug, Wafer, and Butt-Welding	7th	2010	C59407	$106.00	99
Std	598	Valve Inspection and Testing	10th	2016	C59810	$96.00	99
Std	599	Metal Plug Valves—Flanged, Threaded, and Welding Ends	7th	2013	C59907	$80.00	99
Std	599	Metal Plug Valves—Flanged, Threaded, and Welding Ends—Russian	7th	2013	C59907R	$64.00	99, 169
Std	600	Steel Gate Valves—Flanged and Butt-Welding Ends, Bolted Bonnets	13th	2015	C60013	$135.00	99
Std	600	Steel Gate Valves—Flanged and Butt-Welding Ends, Bolted Bonnets—Chinese	13th	2015	C60013C	$95.00	99, 165
Std	602	Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries	10th	2015	C60210	$125.00	100
Std	603	Corrosion-Resistant, Bolted Bonnet Gate Valves—Flanged and Butt-Welding Ends	8th	2013	C60308	$80.00	100
Std	603	Corrosion-Resistant, Bolted Bonnet Gate Valves—Flanged and Butt-Welding Ends—Russian	8th	2013	C60308R	$64.00	100, 169
Std	607	Fire Test for Quarter-Turn Valves and Valves Equipped with Nonmetallic Seats	7th	2016	C60707	$97.00	100
Std	608	Metal Ball Valves—Flanged, Threaded, and Welding Ends	5th	2012	C60805	$109.00	100
Std	608	Metal Ball Valves—Flanged, Threaded, and Welding Ends—Chinese	5th	2012	C60805C	$77.00	100, 165
Std	608	Metal Ball Valves—Flanged, Threaded, and Welding Ends—Russian	5th	2012	C60805R	$88.00	100, 169
Std	609	Butterfly Valves: Double-Flanged, Lug- and Wafer-Type	8th	2016	C60908	$105.00	100
Std	610/ISO 13709:2009	Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries	11th	2010	CX61011	$257.00	90
Std	611	General Purpose Steam Turbines for Petroleum, Chemical, and Gas Industry Services	5th	2008	C61105	$147.00	90
Std	612	Petroleum Petrochemical and Natural Gas Industries—Steam Turbines—Special-Purpose Applications	7th	2014	C61207	$220.00	91
Std	613	Special Purpose Gear Units for Petroleum, Chemical and Gas Industry Services	5th	2003	C61305	$165.00	91
Std	614/ISO 10438-1:2007	Lubrication, Shaft-Sealing and Oil-Control Systems and Auxiliaries	5th	2008	CX61402	$293.00	91
RP	615	Valve Selection Guide	2nd	2016	C61502	$88.00	101
Std	616	Gas Turbines for the Petroleum, Chemical and Gas Industry Services	5th	2011	C61605	$206.00	91
Std	617	Axial and Centrifugal Compressors and Expander-Compressors	8th	2014	C61707	$240.00	91
Std	618	Reciprocating Compressors for Petroleum, Chemical and Gas Industry Services	5th	2007	C61805	$181.00	91
Std	619/ISO 10440-1:2007	Rotary-Type Positive Displacement Compressors for Petroleum, Petrochemical and Natural Gas Industries	5th	2010	CX61905	$216.00	91
Std	620	Design and Construction of Large, Welded, Low-Pressure Storage Tanks	12th	2013	C62012	$435.00	95
Std	620	Design and Construction of Large, Welded, Low-Pressure Storage Tanks—Chinese	12th	2013	C62012C	$305.00	95, 165
RP	621	Reconditioning of Metallic Gate, Globe, and Check Valves	3rd	2010	C62103	$140.00	101
RP	621	Reconditioning of Metallic Gate, Globe, and Check Valves—Russian	3rd	2010	C62103R	$112.00	101, 169
Std	622	Type Testing of Process Valve Packing for Fugitive Emissions	2nd	2011	C62202	$140.00	101
Std	623	Steel Globe Valves—Flanged and Butt-Welding Ends, Bolted Bonnets	1st	2013	C62301	$75.00	101
Std	624	Type Testing of Rising Stem Valves Equipped with Flexible Graphite Packing for Fugitive Emissions	1st	2014	C62401	$85.00	101
Std	625	Tank Systems for Refrigerated Liquefied Gas Storage	1st	2010	C62501	$232.00	95
Std	641	Type Testing of Quarter-Turn Valves for Fugitive Emissions	1st	2016	C64101	$75.00	101
Std	650	Welded Tanks for Oil Storage	12th	2013	C65012	$475.00	95
Std	650	Welded Tanks for Oil Storage—Chinese	12th	2013	C65012C	$333.00	95, 165
RP	651	Cathodic Protection of Aboveground Petroleum Storage Tanks	4th	2014	C65104	$125.00	95
RP	651	Cathodic Protection of Aboveground Petroleum Storage Tanks—Chinese	4th	2014	C65104C	$88.00	95, 165
RP	652	Linings of Aboveground Petroleum Storage Tank Bottoms	4th	2014	C65204	$130.00	95
RP	652	Linings of Aboveground Petroleum Storage Tank Bottoms—Chinese	4th	2014	C65204C	$91.00	96, 166

Pub	Number	Title	Edition	Date	Product Number	Price	Page(s)
Std	653	Tank Inspection, Repair, Alteration, and Reconstruction	5th	2014	C65305	$235.00	90, 96
Std	653	Tank Inspection, Repair, Alteration, and Reconstruction—Chinese	5th	2014	C65305C	$165.00	90, 96, 166
Std	660	Shell-and-Tube Heat Exchangers	9th	2015	C66009	$185.00	103
Std	661	Petroleum, Petrochemical, and Natural Gas Industries—Air-Cooled Heat Exchangers for General Refinery Service	7th	2013	C66107	$250.00	103
Std	662, Part 1/ISO 15547-1:2005	Plate Heat Exchangers for General Refinery Services, Part 1—Plate-and-Frame Heat Exchangers	1st	2006	CX662101	$132.00	103
Std	662, Part 2/ISO 15547-2:2005	Plate Heat Exchangers for General Refinery Services, Part 2—Brazed Aluminum Plate-Fin Heat Exchangers	1st	2006	CX662201	$132.00	104
Std	663	Hairpin-Type Heat Exchangers	1st	2014	C66301	$175.00	104
Std	664	Spiral Plate Heat Exchangers	1st	2014	C66401	$175.00	104
Std	670	Machinery Protection Systems	5th	2014	C67005	$195.00	91
Std	671/ISO 10441:2007	Special Purpose Couplings for Petroleum, Chemical and Gas Industry Services	4th	2007	C67104	$167.00	91
Std	672	Packaged, Integrally Geared Centrifugal Air Compressors for Petroleum, Chemical, and Gas Industry Services	4th	2004	C67204	$235.00	92
Std	673	Centrifugal Fans for Petroleum, Chemical, and Gas Industry Services	3rd	2014	C67303	$170.00	92
Std	674	Positive Displacement Pumps—Reciprocating	3rd	2010	C67403	$186.00	92
Std	675	Positive Displacement Pumps—Controlled Volume for Petroleum, Chemical, and Gas Industry Services	3rd	2012	C67503	$127.00	92
Std	676	Positive Displacement Pumps—Rotary	3rd	2009	C67603	$150.00	92
Std	676	Positive Displacement Pumps—Rotary—Chinese	3rd	2009	C67603 CN945	$105.00	92, 166
Std	677	General-Purpose Gear Units for Petroleum, Chemical and Gas Industry Services	3rd	2006	C67703	$165.00	92
Std	681	Liquid Ring Vacuum Pumps and Compressors for Petroleum, Chemical, and Gas Industry Services	1st	1996	C68101	$142.00	92
Std	682	Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps	4th	2014	C68204	$255.00	92
Std	682	Pumps—Shaft Sealing Systems for Centrifugal and Rotary Pumps—Chinese	4th	2014	C68204C	$179.00	93, 166
RP	684	API Standard Paragraphs Rotordynamic Tutorial: Lateral Critical Speeds, Unbalance Response, Stability, Train Torsionals, and Rotor Balancing	2nd	2005	C68402	$176.00	93
Std	685	Sealless Centrifugal Pumps for Petroleum, Petrochemical, and Gas Industry Process Service	2nd	2011	C68502	$206.00	93
RP	686	Recommended Practice for Machinery Installation and Installation Design	2nd	2009	C68602	$187.00	93
RP	687	Rotor Repair	1st	2001	C68701	$267.00	93
RP	687	Rotor Repair—Data CD	1st	2001	C68701	$247.00	93
RP	688	Pulsation and Vibration Control in Positive Displacement Machinery Systems for Petroleum, Petrochemical, and Natural Gas Industry Services	1st	2012	C68801	$156.00	93
Std	689/ISO 14224:2006	Collection and Exchange of Reliability and Maintenance Data for Equipment	1st	2007	CC68901	$213.00	93
RP	751	Safe Operation of Hydrofluoric Acid Alkylation Units	4th	2013	K75104	$150.00	112
RP	752	Management of Hazards Associated with Location of Process Plant Permanent Buildings	3rd	2009	K75203	$141.00	110, 117
RP	753	Management of Hazards Associated with Location of Process Plant Portable Buildings	1st	2007	K75301	$141.00	111, 117
RP	754	Process Safety Performance Indicators for the Refining and Petrochemical Industries	2nd	2016	K75402	$150.00	111, 118
RP	755	Fatigue Risk Management Systems for Personnel in the Refining and Petrochemical Industries	1st	2010	K75501	$83.00	111, 118
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	$103.00	111, 118
RP	756	Management of Hazards Associated with Location of Process Plant Tents	1st	2014	C75601	$125.00	112, 118
TR	756-1	Process Plant Tent Responses to Vapor Cloud Explosions—Results of the American Petroleum Institute Tent Testing Program	1st	2014	C756101	$190.00	112, 118
Publ	770	A Manager's Guide to Reducing Human Errors—Improving Human Performance in the Process Industries	1st	2001	K77001	$76.00	119
Std	780	Security Risk Assessment Methodology for the Petroleum and Petrochemical Industries	1st	2013	K78001	$190.00	86, 113, 119
RP	781	Facility Security Plan Methodology for the Oil and Natural Gas Industries	1st	2016	K78101	$145.00	86, 113
Publ	800	Literature Survey: Subsurface and Groundwater Protection Related to Petroleum Refinery Operations	1st	1988	C80000	$92.00	112
TR	932-A	A Study of Corrosion in Hydroprocess Reactor Effluent Air Cooler Systems	2nd	2002	C932A0	$151.00	106
Publ	932-B	Design, Materials, Fabrication, Operation, and Inspection Guidelines for Corrosion Control in Hydroprocessing Reactor Effluent Air Cooler (REAC) Systems	2nd	2012	C932B02	$257.00	106
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	2nd	2008	C934A02	$107.00	107
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—Russian	2nd	2008	C934A02R	$86.00	107, 169
TR	934-B	Fabrication Considerations for Vanadium-Modified Cr-Mo Steel Heavy Wall Pressure Vessels	1st	2011	C934B01	$135.00	107

Publications by Number

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Pub	Number	Title	Edition	Date	Product Number	Price	Page(s)
RP	934-C	Materials and Fabrication of 1 1/4CR-1/2Mo Steel Heavy Wall Pressure Vessels for High Pressure Hydrogen Service Operating at or Below 825 °F (441 °C)	1st	2008	C934C01	$107.00	107
RP	934-C	Materials and Fabrication of 1 1/4CR-1/2Mo Steel Heavy Wall Pressure Vessels for High Pressure Hydrogen Service Operating at or Below 825 °F (441 °C)—Russian	1st	2008	C934C01R	$86.00	107, 170
TR	934-D	Technical Report on the Materials and Fabrication Issues of 1 1/4Cr-1/2Mo and 1Cr-1/2Mo Steel Pressure Vessels	1st	2010	C934D01	$135.00	107
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)	1st	2010	C934E01	$107.00	108
RP	934-E	Recommended Practice for Materials and Fabrication of 1 1/4Cr-1/2Mo Steel Pressure Vessels for Service Above 825 °F (440 °C)—Russian	1st	2010	C934E01R	$86.00	108, 170
RP	934-G	Design, Fabrication, Operational Effects, Inspection, Assessment, and Repair of Coke Drums and Peripheral Components in Delayed Coking Units	1st	2016	C934G01	$150.00	108
Publ	935	Thermal Conductivity Measurement Study of Refractory Castables	1st	1999	C93501	$60.00	108
Std	936	Refractory Installation Quality Control—Inspection and Testing Monolithic Refractory Linings and Materials	4th	2014	C93604	$150.00	108
Publ	937	Evaluation of Design Criteria for Storage Tanks with Frangible Roof Joints	1st	1996	C93701	$135.00	96
Publ	937-A	Study to Establish Relations for the Relative Strength of API 650 Cone Roof, Roof-to-Shell and Shell-to-Bottom Joints	1st	2005	C937A0	$122.00	96, 108
Publ	938-A	An Experimental Study of Causes and Repair of Cracking of 1 1/4Cr- 1/2Mo Steel Equipment	1st	1996	C93801	$164.00	108
Publ	938-B	Use of 9Cr-1Mo-V (Grade 91) Steel in the Oil Refining Industry	1st	2008	C938B01	$109.00	108
TR	938-C	Use of Duplex Stainless Steels in the Oil Refining Industry	3rd	2015	C938C03	$180.00	108
TR	939-A	Research Report on Characterization and Monitoring of Cracking in Wet H_2S Service	1st	1994	C93901	$156.00	109
Publ	939-B	Repair and Remediation Strategies for Equipment Operating in Wet H_2S Service	1st	2002	C939B0	$171.00	109
RP	939-C	Guidelines for Avoiding Sulfidation (Sulfidic) Corrosion Failures in Oil Refineries	1st	2009	C939C01	$114.00	109
TR	939-D	Stress Corrosion Cracking of Carbon Steel in Fuel Grade Ethanol— Review, Experience Survey, Field Monitoring, and Laboratory Testing	2nd	2007	C939D0	$160.00	96, 109
Bull	939-E	Identification, Repair, and Mitigation of Cracking of Steel Equipment in Fuel Ethanol Service	2nd	2013	C939E02	$160.00	109
RP	941	Steels for Hydrogen Service at Elevated Temperatures and Pressures in Petroleum Refineries and Petrochemical Plants	8th	2016	C94108	$140.00	109
TR	941	The Technical Basis Document for API RP 941	1st	2008	C09410	$198.00	109
TR	942-A	Materials, Fabrication, and Repair Considerations for Hydrogen Reformer Furnace Outlet Pigtails and Manifolds	1st	2014	C942A01	$140.00	110
RP	945	Avoiding Environmental Cracking in Amine Units	3rd	2003	C94503	$101.00	110
Publ	959	Characterization Study of Temper Embrittlement of Chromium-Molybdenum Steels	1st	1982	C95900	$157.00	110
TR	997	Comprehensive Report of API Crude Oil Characterization Measurements	1st	August	C99701	$211.00	105
RP	1004	Bottom Loading and Vapor Recovery for MC-306 & DOT-406 Tank Motor Vehicles	8th	2003	A10048	$111.00	75, 85
RP	1007	Loading and Unloading of MC 306/DOT 406 Cargo Tank Motor Vehicles	1st	2001	A10071	$39.00	76, 85
RP	1102	Steel Pipelines Crossing Railroads and Highways	7th	2007	D11021	$116.00	79
Std	1104	Welding of Pipelines and Related Facilities	21st	2013	D110421	$345.00	79, 84
Std	1104	Welding of Pipelines and Related Facilities—Kazakh	21st	2013	D110421K	$276.00	79, 84, 167
Std	1104	Welding of Pipelines and Related Facilities—Portuguese	21st	2013	D110421P	$345.00	80, 85, 167
Std	1104	Welding of Pipelines and Related Facilities—Russian	21st	2013	D110421R	$276.00	80, 85, 170
Std	1104	Welding of Pipelines and Related Facilities—Spanish	21st	2013	D11042SP	$345.00	80, 85, 172
RP	1109	Marking Liquid Petroleum Pipeline Facilities	4th	2010	D11094	$89.00	80
RP	1110	Recommended Practice for the Pressure Testing of Steel Pipelines for the Transportation of Gas, Petroleum Gas, Hazardous Liquids, Highly Volatile Liquids, or Carbon Dioxide	6th	2013	D11106	$95.00	80
RP	1111	Design, Construction, Operation, and Maintenance of Offshore Hydrocarbon Pipelines (Limited State Design)	5th	2015	D11115	$140.00	80
RP	1112	Developing a Highway Emergency Response Plan for Incidents Involving Hazardous Materials	3rd	1997	A11123	$76.00	76, 85
RP	1113	Developing a Pipeline Supervisory Control Center	1st	2007	D11131	$85.00	80
RP	1114	Recommended Practice for the Design of Solution-Mined Underground Storage Facilities	2nd	2013	D11142	$90.00	80
RP	1115	Recommended Practice on the Operation of Solution-Mined Underground Storage Facilities	1st	1994	D11151	$86.00	81
RP	1117	Recommended Practice for Movement in In-Service Pipelines	3rd	2008	D11173	$132.00	81
RP	1130	Computational Pipeline Monitoring for Liquids	1st	2007	D011301	$112.00	81
RP	1133	Guidelines for Onshore Hydrocarbon Pipelines Affecting High Consequence Floodplains	1st	2005	D11331	$82.00	81
TR	1149	Pipeline Variable Uncertainties and Their Effects on Leak Detectability	2nd	2015	D11492	$165.00	81
TR	1149-3	Canine Oil Detection: Field Trials Report		2016	see listing		148
TR	1149-4	Canine Oil Detection (K9-SCAT) Guidelines		2016	see listing		148
TR	1151-4	Mechanical Treatment of Sand Beaches Historical Library Report		2016	see listing		148
TR	1153-1	Tidal Inlet Protection Strategies (TIPS): Phase 1—Final Report		2016	see listing		148

Publications by Number

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Pub	Number	Title	Edition	Date	Product Number	Price	Page(s)
TR	1153-2	Tidal Inlet Protection Strategies (TIPS) Field Guide		2016	see listing		148
TR	1154-1	Sunken Oil Detection and Recovery		2016	see listing		148
TR	1154-2	Sunken Oil Detection and Recovery Operational Guide		2016	see listing		148
TR	1155-1	Shoreline In Situ Treatment (Sediment Mixing and Relocation) Library Report		2016	see listing		148
TR	1155-2	Shoreline In Situ Treatment (Sediment Mixing and Relocation) Fact Sheet		2016	see listing		149
TR	1155-3	Shoreline In Situ Treatment (Sediment Mixing and Relocation) Job Aid		2016	see listing		149
Std	1160	Managing System Integrity for Hazardous Liquid Pipelines	2nd	2013	D116002	$215.00	81
RP	1161	Recommended Practice for Pipeline Operator Qualification (OQ)	3rd	2014	D11613	$210.00	81
RP	1162	Public Awareness Programs for Pipeline Operators	2nd	2010	D11622	$124.00	82
Std	1163	In-Line Inspection Systems Qualification	2nd	2013	D11632	$131.00	82
Std	1164	Pipeline SCADA Security	2nd	2009	D11642	$146.00	78, 82
RP	1165	Recommended Practice for Pipeline SCADA Displays	1st	2007	D11651	$152.00	82
TR	1166	Excavation Monitoring and Observation for Damage Prevention	2nd	2015	D11662	$106.00	82
RP	1167	Pipeline SCADA Alarm Management	2nd	2016	D116702	$125.00	82
RP	1168	Pipeline Control Room Management	2nd	2015	D11682	$90.00	83
RP	1169	Recommended Practice for Basic Inspection Requirements—New Pipeline Construction	1st	2013	D11691	$115.00	83
RP	1170	Design and Operation of Solution-Mined Salt Caverns Used for Natural Gas Storage	1st	2015	D117001	$120.00	83
RP	1171	Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs	1st	2015	D117101	$120.00	83
RP	1172	Recommended Practice for Construction Parallel to Existing Underground Transmission Pipelines	1st	2014	D11721	$85.00	83
RP	1173	Pipeline Safety Management Systems	1st	2015	D117301	$85.00	83
RP	1174	Recommended Practice for Onshore Hazardous Liquid Pipeline Emergency Preparedness and Response	1st	2015	D11741	$93.00	84
RP	1175	Pipeline Leak Detection—Program Management	1st	2015	D11751	$160.00	84
RP	1176	Recommended Practice for Assessment and Management of Cracking in Pipelines	1st	2016	D117601	$168.00	84
TR	1253	API Selection and Training Guidelines for In Situ Burning Personnel		2016	see listing		149
TR	1256	In Situ Burning: A Decision Maker's Guide		2016	see listing		149
Publ	1509	Engine Oil Licensing and Certification System	17th	2012	see listing		76
Publ	1520	Directory of Licensees: API Engine Oil Licensing and Certification System			see listing		76
RP	1525	Bulk Oil Testing, Handling, and Storage Guidelines	1st	1997	F15251	$65.00	74
EI	1529	Aviation Fuelling Hose			see listing		73
EI	1540	Design, Construction, Operation and Maintenance of Aviation Fueling Facilities, IP Model Code of Safe Practice Part 7			see listing		73
EI	1542	Identification Markings for Dedicated Aviation Fuel Manufacturing and Distribution Facilities, Airport Storage and Mobile Fuelling Equipment			see listing		73
RP	1543	Documentation, Monitoring and Laboratory Testing of Aviation Fuel During Shipment from Refinery to Airport	1st	2009	A154301	$59.00	73
EI	1550	Handbook on Equipment Used for the Maintenance and Delivery of Clean Aviation Fuel			see listing		73
Publ	1571	Diesel Fuel—Questions and Answers for Highway and Off-Highway Use	4th	1996	see listing		76
EI	1581	Specification and Qualification Procedures for Aviation Jet Fuel Filter/Separators			see listing		73
EI	1582	Specification for Similarity for API/EI 1581 Aviation Jet Fuel Filter/Separators			see listing		73
EI	1584	Four-Inch Aviation Hydrant System Components and Arrangements			see listing		73
EI	1585	Guidance in the Cleaning of Aviation Fuel Hydrant Systems at Airports			see listing		73
EI	1590	Specifications and Qualification Procedures for Aviation Fuel Microfilters			see listing		73
Publ	1593	Gasoline Marketing in the United States Today	3rd	1992	A15930	$115.00	73
EI	1594	Initial Pressure Strength Testing of Airport Fuel Hydrant Systems with Water			see listing		73
RP	1595	Design, Construction, Operation, Maintenance, and Inspection of Aviation Pre-Airfield Storage Terminals	2nd	2012	C159502	$232.00	73
EI	1596	Design and Construction of Aviation Fuel Filter Vessels			see listing		73
EI	1597	Procedures for Overwing Fuelling to Ensure Delivery of the Correct Fuel Grade to an Aircraft			see listing		73
EI	1598	Considerations for Electronic Sensors to Monitor Free Water and/or Particulate Matter in Aviation Fuel			see listing		73
EI	1599	Laboratory Tests and Minimum Performance Levels for Aviation Fuel Dirt Defense Filters			see listing		73
RP	1604	Closure of Underground Petroleum Storage Tanks	3rd	1996	A16043	$76.00	74
Publ	1612	Guidance Document for Discharging of Petroleum Distribution Terminal Effluents to Publicly Owned Treatment Works	1st	1996	A16121	$97.00	77
RP	1615	Installation of Underground Petroleum Storage Systems	6th	2011	A16156	$205.00	74
Publ	1621	Bulk Liquid Stock Control at Retail Outlets	5th	1993	A16210	$83.00	74
RP	1626	Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Filling Stations	2nd	2010	A16262	$155.00	74

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RP	1639	Owner/Operator's Guide to Operation and Maintenance of Vapor Recovery Systems at Gasoline Dispensing Facilities	1st	2003	A16391	$86.00	74
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RP	2016	Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks	1st	2001	K20161	$192.00	96, 122
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RP	2023	Guide for Safe Storage and Handling of Heated Petroleum Derived Asphalt Products and Crude Oil Residua	3rd	2001	K20233	$110.00	122
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RP	2221	Contractor and Owner Safety Program Implementation	3rd	2011	K222103	$167.00	120
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Publ	2379	2000 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only		2001	K23790	$103.00	121, 132
Publ	2380	2001 Survey on Petroleum Industry Occupational Injuries, Illness, and Fatalities Summary Report: Aggregate Data Only		2002	K23801	$103.00	121, 132
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Std	2510	Design and Construction of LPG Installations—Spanish	8th	2001	C25108SP	$103.00	97, 172
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Publ	4711	Methods for Determining Inputs to Environmental Petroleum Hydrocarbon Mobility and Recovery Models		2001	I47110	$112.00	141
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April 24–25	Annual API Federal Tax Forum	Houston, TX
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May 8–11	Spring Refining and Equipment Standards Meeting	Las Vegas, NV
May 10	API/AFPM Spring Operating Practices Symposium	Las, Vegas NV
May 15–18	International Oil Spill Conference	Long Beach, CA
June 6–7	API Excise Tax Forum	Houston, TX
June 26–30	Exploration and Production Standards Conference on Oilfield Equipment and Materials	Calgary, Alberta
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October 16–20	Fall Committee on Petroleum Measurement Standards Meeting	Washington, DC
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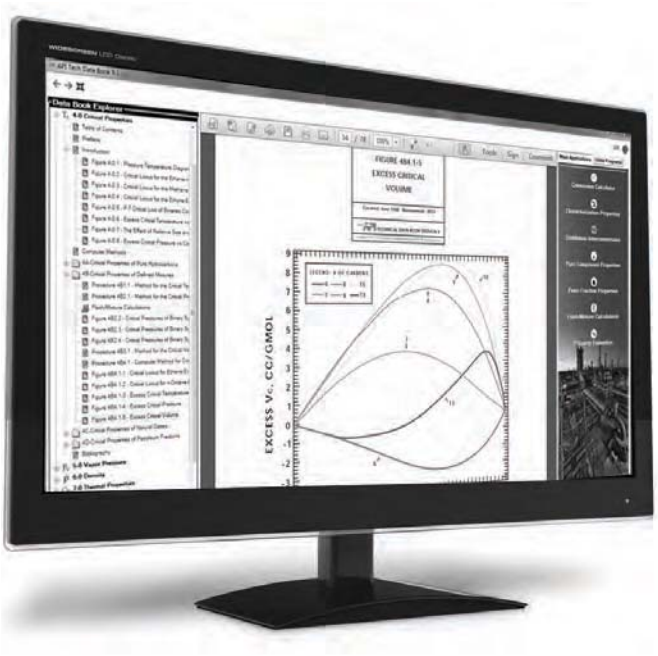

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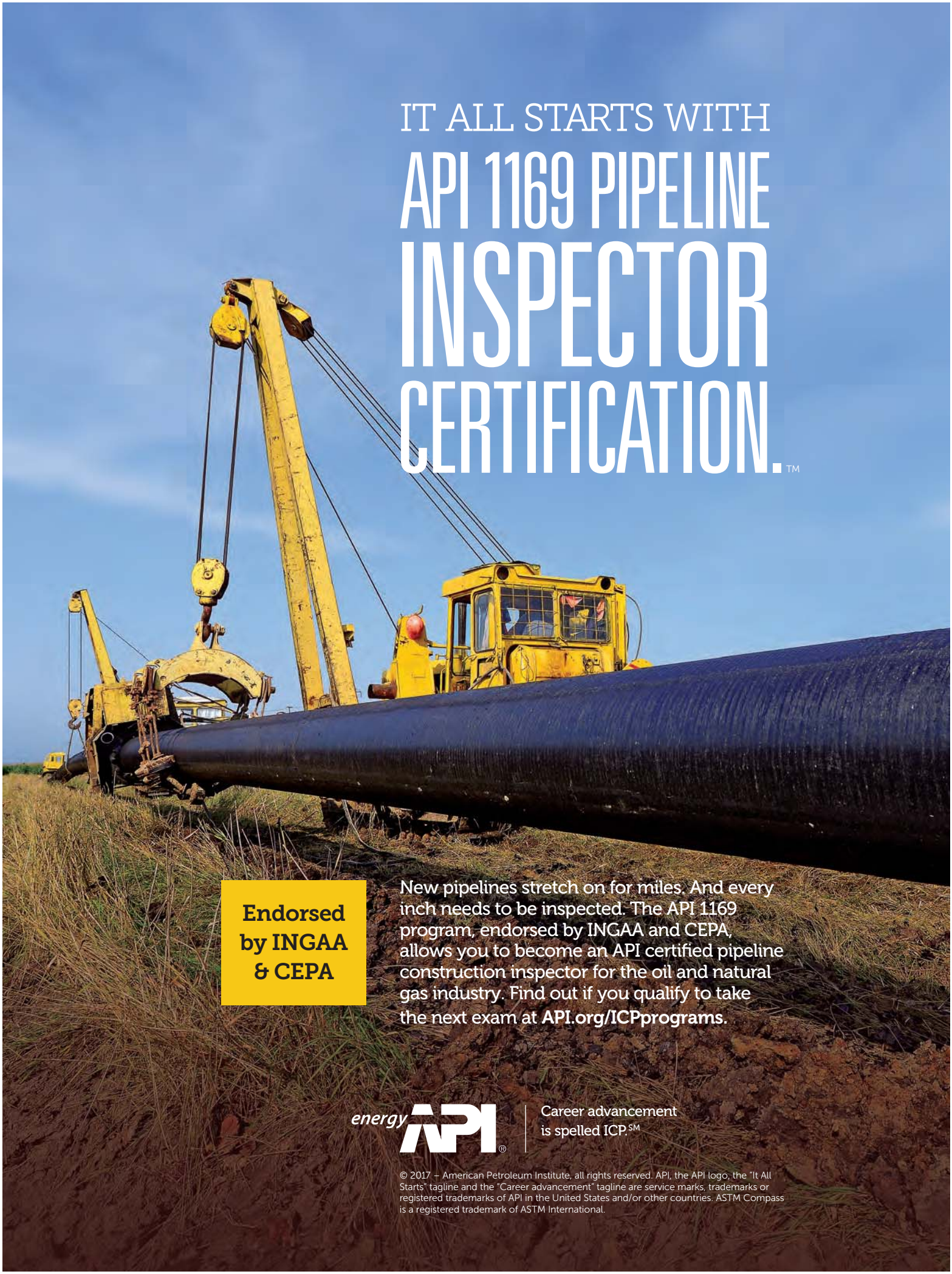

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