

# Standards & Codes

The valve business has been regulated by a number of standards issued primary by national bodies, with a prevalence of American institutions (API, NACE, ANSI, ASME).

In the past few years ISO is incorporating all international standards into a uniform body of rules.

The ISO denomination is still not used widely.

In the following page we identify traditionally used standards even if already superseded by an ISO standard.  
A **red** code indicate a superseded standard

# Standards & Codes

ISO	International Standardization Organization
API	American Petroleum Institute
ASTM	American Society for Testing and Material
ASME	American Society of Mechanical Engineers
ANSI	American National Standard Institute
MSS	Manufacturers Standardization Society of the Valve and Fitting Industry
NACE	National Association of Corrosion Engineers
BS	British Standards Institute

# ISO – International Standard Org.

[www.iso.org](http://www.iso.org)



- ISO 5208:1993 Industrial valves -- Pressure testing of valves
- ISO 5209:1977 General purpose industrial valves -- Marking
- ISO 5752:1982 Metal valves for use in flanged pipe systems – Face-to-face and centre-to-face dimensions
- ISO 5996:1984 Cast iron gate valves
- ISO 6002:1992 Bolted bonnet steel gate valves
- ISO 12149:1999 Bolted bonnet steel globe valves for general-purpose applications
- ISO 7121:1986 Flanged steel ball valves
- ISO 7259:1988 Predominantly key-operated cast iron gate valves for underground use
- ISO 10434:2004 Bolted bonnet steel gate valves for the petroleum, petrochemical and allied industries
- ISO 10497:2004 Testing of valves -- Fire type-testing requirements
- ISO 10631:1994 Metallic butterfly valves for general purposes
- ISO 12149:1999 Bolted bonnet steel globe valves for general-purpose applications
- ISO 15761:2002 Steel gate, globe and check valves for sizes DN 100 and smaller, for the petroleum and natural gas industries
- ISO 15848-1:2006 Industrial valves -- Measurement, test and qualification procedures for fugitive emission  
Part 1: Classification system and qualification procedures for type testing of valves
- ISO 17292:2004 Metal ball valves for petroleum, petrochemical and allied industries

# ISO – International Standard Org.

[www.iso.org](http://www.iso.org)



## **ISO 10423:2003**

Petroleum and natural gas industries - Drilling and production equipment - Wellhead and christmas tree equipment

specifies requirements and gives recommendations for the performance, dimensional and functional interchangeability, design, materials, testing, inspection, welding, marking, handling, storing, shipment, purchasing, repair and remanufacture of wellhead and christmas tree equipment for use in the petroleum and natural gas industries.

eq. API 6A

2 Design Standard

ISO – International Standard Org.

[www.iso.org](http://www.iso.org)



**ISO 14313:1999**

Petroleum and natural gas industries -- Pipeline transportation systems --  
Pipeline valves

eq. API6D

2 Design  
Standard

# ISO – International Standard Org.

[www.iso.org](http://www.iso.org)



## ISO 15156

### NACE MR0175, Petroleum and natural gas industries—Materials for use in H<sub>2</sub>S-containing environments in oil and gas production

Includes new addenda for 2005! NACE MR0175/ISO 15156 gives requirements and recommendations for the selection and qualification of carbon and low-alloy steels, corrosion-resistant alloys, and other alloys for service in equipment used in oil and natural gas production and natural gas treatment plants in H<sub>2</sub>S-containing environments, whose failure could pose a risk to the health and safety of the public and personnel or to the environment. It can be applied to help to avoid costly corrosion damage to the equipment itself. NACE MR0175/ISO 15156 consists of three standards and four technical corrigenda (addenda), available through NACE as a complete package: Part 1: General principles for selection of cracking-resistant materials Part 2: Cracking-resistant carbon and low alloy steels, and the use of cast irons Part 3: Cracking-resistant CRAs (corrosion-resistant alloys) and other alloys Part 1, Technical Corrigendum 1 Part 2, Technical Corrigendum 1 Part 3, Technical Corrigendum 1 Part 3, Technical Corrigendum 2 Key words: aluminum alloys, austenitic stainless steels, bolts, carbon steels, cast iron, ceramic coatings, cobalt alloys, cold working, copper alloys, fabrication, ferritic stainless steels, free-machining steels, hardness, hydrogen sulfide, identification marking, low-alloy steels, martensitic stainless steels, metals, oilfield production equipment, overlays, precipitation-hardening steels, pressure gauges, protective coatings, sealing rings, shot peening, sour environments, springs, stainless steels, sulfide stress cracking, valves, welding.

# API - American Petroleum Institute

[www.api.org](http://www.api.org)



- API 6D Specification for Pipeline Valves
- API 6A Specification for Wellhead and Christmas Tree Equipment
- API 6FA Specification for Fire Test for Valves
- API 591 User Acceptance of Refinery Valves
- API 598 Valve Inspection and Testing
- API 600 Steel Gate Valves
- **API 602** Compact Carbon Steel Gate Valves
- API 603 Cast, Corrosion Resistant Gate Valves
- API 17D Specification for Subsea Wellhead and Christmas Tree Equipment

2 Design Standard

# API - American Petroleum Institute

[www.api.org](http://www.api.org)



## Spec 6A

Specification for Wellhead and Christmas Tree Equipment  
(includes Errata dated September 2004)

Specifies requirements and gives recommendations for the performance, dimensional and functional interchangeability, design, materials, testing, inspection, welding, marking, handling, storing, shipment and purchasing, of wellhead and christmas tree equipment for use in the petroleum and natural gas industries.

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

19th Edition / July 2004 / Effective Date: February 2005



# API - American Petroleum Institute

[www.api.org](http://www.api.org)



## **Spec 6A718**

Specification of Nickel Base Alloy 718 (UNS N07718) for Oil and Gas Drilling and Production Equipment

Provides specification requirements for Nickel Base Alloy 718 (UNS N07718) that are intended to supplement the existing requirements of API Spec 6A and ISO 10423. These additional specification requirements include detailed process control requirements and detailed testing requirements. Pages: 17

1st Edition / March 2004 / Product Number: G6A7181

Design  
Standard

# API - American Petroleum Institute

[www.api.org](http://www.api.org)



## **Spec 6D / ISO 14313**

Specification for Pipeline Valves

Petroleum and Natural Gas Industries—Pipeline Transportation Systems—Pipeline Valves

API Specification 6D is the (proposed) national adoption of ISO 14313: 1999 MOD. This Standard specifies requirements and gives recommendations for the design, manufacturing, testing and documentation of ball, check, gate and plug valves for application in pipeline systems.

Valves for pressure ratings exceeding PN 420 (Class 2500) are not covered by this Standard. Annex A of this Spec 6D provides guidelines to assist the purchaser with valve type selection and specification of specific requirements when ordering valves. Annex E provides information on API Monogram Licensing requirements. Annex F includes the technical modifications and editorial changes.

22nd Edition / January 2002 / Effective Date: July 1, 2002

API - American Petroleum Institute

[www.api.org](http://www.api.org)



## **Spec 6FA**

Fire Test for Valves

Covers the requirements for testing and evaluating the performance of API Spec 6A and Spec 6D valves when exposed to specifically defined fire conditions.

3rd Edition / April 1999 /

2 Design  
Standards

# API - American Petroleum Institute

[www.api.org](http://www.api.org)



## **RP 591**

Process Valve Qualification Procedure

Provides recommendations for evaluation of a manufacturer's valve construction and quality assurance program for the purpose of determining

a manufacturer's capability to provide new valves manufactured in accordance with the applicable API standards listed in Section 2. Qualification of valves under this recommended practice is "manufacturing facility specific" and does not cover valves manufactured by other manufacturing facilities, whether owned by the same manufacturer or a third party. Pages: 9

3rd Edition / September 2003

# API - American Petroleum Institute

[www.api.org](http://www.api.org)



## **Std 598**

### Valve Inspection and Testing

Covers inspection, examination, supplementary examinations, and pressure test requirements for resilient-seated, nonmetallic-seated (for example, ceramic), and metal-to-metal-seated valves of the gate, globe, plug, ball, check, and butterfly types.

API Std 598 supplements the API standards that reference it, but it may also be applied to other types of valves by agreement between the purchaser

and the valve manufacturer.

8th Edition / May 2004

2 Design Standard

# API - American Petroleum Institute

[www.api.org](http://www.api.org)



## **API 600/ISO 10434**

Bolted Bonnet Steel Gate Valves for Petroleum and Natural Gas Industries—Modified National Adoption  
(ANSI/API Std 600-2001)

ANSI/API Standard 600 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 indicate a need for full port openings, heavy wall sections and extra large stem diameters.

11th Edition / October 2001

Design  
Standard

# API - American Petroleum Institute

[www.api.org](http://www.api.org)



## **Std 602/ISO 15761**

Steel Gate, Globe and Check Valves for Sizes DN 100 and Smaller for the Petroleum and Natural Gas Industries

Covers threaded-end, socket-welding-end, butt-welding-end, and flanged-end compact carbon steel gate valves in sizes NPS 4 and smaller.

8th Edition / January 2005

2 Design Standard

# API - American Petroleum Institute

[www.api.org](http://www.api.org)



## **Std 607/ISO 10497**

Fire Test for Soft-Seated Quarter-Turn Valves

Specifies fire type-testing requirements and a fire type-test method for confirming the pressure-containing capability of a valve under pressure during and after the fire test. It does not cover the testing requirements for valve actuators other than manually operated gear boxes or similar mechanisms when these form part of the normal valve assembly. Other types of valve actuators (e.g. electrical, pneumatic or hydraulic) may need special protection to operate in the environment considered in this valve test, and the fire testing of such actuators is outside the scope of this Standard. Pages: 16

5th Edition / June 2005



## Std 608

Metal Ball Valves—Flanged, Threaded and Butt-Welding Ends

Covers metal ball valves used in on-off service that have butt-welding of flanged ends for nominal pipe size NPS 1/2 through NPS 12 and threaded or socket-welding ends for sizes NPS 1/2 through NPS 2, corresponding

to the nominal pipe sizes in ASME B36.10M. Also covers additional requirements for ball valves that are otherwise in full conformance to the requirements of ASME B16.34, Standard Class.

Pages: 6

3rd Edition / August 2002

# API - American Petroleum Institute

[www.api.org](http://www.api.org)



## **Std 622**

Type Testing of Process Valve Packing for Fugitive Emissions

This API Standard specifies the requirements for comparative testing of block valve stem packing for process applications where fugitive emissions are a consideration. Packing(s) shall be suitable for use at -20 degrees F. to 1000 degrees F. (-29 degrees C. to 538 degrees C). Factors affecting fugitive emissions performance that are considered by this Standard include temperature, pressure, thermal cycling and mechanical cycling.

1st Edition / to be published Q1, 2006

2 Design Standard

# ASME — American Society of Mech. Eng.



## Boiler and Pressure Vessel Code

- Section II Materials
- Section III Rules for Construction of Nuclear Power Plant Components
- Section V Non-destructive Examination
- Section VIII Rules for Construction of Pressure Vessels
- Section IX Welding and Brazing Qualifications
- Section XI Rules for In-service Inspection of Nuclear Power Plant Components

Design  
Standard

ANSI American Nat'l Standards Ins.

[www.ansi.org](http://www.ansi.org)



## ASME – ANSI

- B16.34 Valves 2 Flanged, Threaded, and Buttwelded End
- B16.10 Face-to-Face and End-to-End Dimensions of Valves
- B16.5 Pipe Flanges and Flanged Fittings
- B16.25 Buttwelded Ends
- B16.11 Forged Fittings, Socket Welding and Threaded

2 Design Standards

# BSI — British Standards Institution



- BS 1414 Steel Wedge Gate Valves
- BS 1868 Steel Check Valves
- BS 1873 Steel Globe Valves
- BS 5351 Steel Ball Valves
- **BS 5352** Steel Wedge Gate, Globe, Check Valves, 50mm **ISO15761** and Smaller
- BS 6364 Valves for Cryogenic Service
- BS 6755 Testing of Valves

2 Design Standard

# MSS — Manufacturers Standardization Society of the Valve and Fitting Industry



- MSS SP-6 Contact Faces of Pipe Flanges
- MSS SP-25 Standard Marking System for Valves, Fittings, Flanges
- MSS SP-55 Quality Standard for Steel Castings (visual method)
- MSS SP-61 Pressure Testing of Steel Valves
- MSS SP-72 Ball Valves with Flanged or BW Ends for General Service
- MSS SP-117 Bellows Seals for Globe and Gate Valves

2 Design Standards

# MSS — Manufacturers Standardization Society of the Valve and Fitting Industry



- MSS SP-6  
Standard finishes for contact faces of pipe flanges of valves and fittings
- MSS SP-9  
Spot facing for bronze , iron and steel flanges
- MSS SP-25  
Standard marking system for valves, fittings, flanges and unions
- MSS SP-42  
Class 150 corrosion resistant gate, globe, angle and check valves with flanged and butt weld ends
- MSS SP-54  
Quality standard for steel castings - radiographic inspection method for valves , flange, fittings and other piping components
- MSS SP-55  
Quality standard for steel castings for valves, flanges and fittings and other piping components
- MSS SP-60  
Connecting flange joint between tapping sleeves and tapping valves

Design  
Standards

# MSS — Manufacturers Standardization Society of the Valve and Fitting Industry



- MSS SP-61  
Hydrostatic testing of steel valves
- MSS SP-67  
Butterfly valves
- MSS SP-70  
Cast iron gate valves , flanged and threaded ends
- MSS SP-71  
Cast iron swing check valves, flanged and threaded ends
- MSS SP-72  
Ball valves with flanged or butt - welding ends for general service
- MSS SP-78  
Cast iron plug valves
- MSS SP-80  
Bronze Gate, globe angle and check valves
- MSS SP-82  
Valves pressure testing methods
- MSS SP-84  
Steel valves socket welding and threaded ends
- MSS SP-86  
Metric data in standards for valves, flanges and fittings



# NACE — National Association of Corrosion Engineers



[www.nace.org](http://www.nace.org)

MR0175  
**ISO 15156**

## Petroleum and natural gas industries—Materials for use in H<sub>2</sub>S-containing environments in oil and gas production

Includes new addenda for 2005! NACE MR0175/ISO 15156 gives requirements and recommendations for the selection and qualification of carbon and low-alloy steels, corrosion-resistant alloys, and other alloys for service in equipment used in oil and natural gas production and natural gas treatment plants in H<sub>2</sub>S-containing environments, whose failure could pose a risk to the health and safety of the public and personnel or to the environment. It can be applied to help to avoid costly corrosion damage to the equipment itself. NACE MR0175/ISO 15156 consists of three standards and four technical corrigenda (addenda), available through NACE as a complete package: Part 1: General principles for selection of cracking-resistant materials Part 2: Cracking-resistant carbon and low alloy steels, and the use of cast irons Part 3: Cracking-resistant CRAs (corrosion-resistant alloys) and other alloys Part 1, Technical Corrigendum 1 Part 2, Technical Corrigendum 1 Part 3, Technical Corrigendum 1 Part 3, Technical Corrigendum 2 Key words: aluminum alloys, austenitic stainless steels, bolts, carbon steels, cast iron, ceramic coatings, cobalt alloys, cold working, copper alloys, fabrication, ferritic stainless steels, free-machining steels, hardness, hydrogen sulfide, identification marking, low-alloy steels, martensitic stainless steels, metals, oilfield production equipment, overlays, precipitation-hardening steels, pressure gauges, protective coatings, sealing rings, shot peening, sour environments, springs, stainless steels, sulfide stress cracking, valves, welding.

MR0103

## MR0103-2005 Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments

Revised in 2005. Defines material requirements for resistance to sulfide stress cracking (SSC) in sour refinery process environments (i.e., environments that contain wet hydrogen sulfide [H<sub>2</sub>S]). The term "wet H<sub>2</sub>S cracking" as used in the refining industry covers a range of damage mechanisms that can occur due to the effects of hydrogen charging in wet H<sub>2</sub>S refinery or gas plant process environments. One of the types of material damage that can occur as a result of hydrogen charging is sulfide stress cracking (SSC) of hard weldments and microstructures, which is addressed by this standard. This standard is intended to be utilized by refineries, equipment manufacturers, engineering contractors, and construction contractors. Key words: aluminum alloys, austenitic stainless steels, carbon steels, cast iron, ceramic coatings, cobalt alloys, copper alloys, ferritic stainless steels, free-machining steels, hydrogen sulfide, low-alloy steels, martensitic stainless steels, metals, nickel alloys, oilfield production equipment, precipitation-hardening steels, sour environments, stainless steels, sulfide stress cracking.