

PRIMARY VALVE STANDARDS

MAJOR VALVE STANDARDS PETROCHEMICAL AND REFINING INDUSTRY

API 600 Steel Valves – Flanged & Butt welding Ends

API 600 is the main steel gate valve specification. Valve design and construction criteria are specified, as well as materials and trim designations. An appendix covers information pertaining to pressure seal valves. ISO Standard 10434 is essentially the same as API 600, re-produced in the ISO format.

API 602 Compact Steel Gate Valves – Flanged, Threaded, Welding and Extended-Body Ends

API 602 is for 100NB (4") & smaller forged steel gate valve specifications. Valve design and construction criteria are specified, as well as materials and trim designations. This standard includes requirements for bellows seal gate valves.

API 603 Cast, Corrosion – Resistant, Flanged-End Gate Valves

API 603 covers light walled gate valves in sizes NPS 15mm to 600mm (1/2" through 24"), in classes 150, 300 & 600. These valves are used in applications where a thicker API 600 casting is not needed.

API 608 Steel Ball Valves – Flanged and Butt-Welding Ends

Typically used for floating ball valves, API 608 is the purchase specification for class 150, 300, 600 and 800 class steel ball valves. Valve design and construction criteria are detailed. Trunnion mounted pipeline ball valves are manufactured to API6D but API608 is also allowable up to 500NB (20")

(Important note: ball valve working pressures should be based on seat material, as well as valve class).

API 609 Butterfly Valves – Lug-Type and Wafer Type

API 609 is a specification for butterfly valves with lug-type and wafer-type configurations designed for installation between ANSI B16 flanges, 150 to 900 Class.

API 598 Valve Inspection & Testing

API 598 covers the testing and inspection requirements for check, gate, globe, ball, plug & butterfly valves. Steel valve pressure ratings in ASME/ANSI B16.34 are required to determine API 598 test pressures for steel valves.

API 6D Specification for Pipeline Valves – Gate, Plug, Ball and Check Valves

Specification for Pipeline Valves (Gate, Ball, Plug, and Check Valves) API 6D is the primary standard for valves used in main line pipeline service, including gate, ball, plug and check valves. Occasionally refinery and petrochemical purchasers will reference the more stringent testing requirements of API 6D for ball, plug and gate valves although generally for ball, check, globe and gate valves API 608, 600, 602, 609 or BS 1868, 1873 is specified upstream. Similarly ball valves manufactured to API 608 may be specified as tested to API 6D.

ASME B16.34 Steel Valves – Flanged & Butt welding Ends

ASME B16.34 is the standard in which steel valve pressure/temperature ratings are specified. It also offers additional valve specification data including nondestructive examination procedures for upgrading valves to for special class service. Gate valves manufactured under B16.34 wall thickness minimums may not meet the minimum wall thickness requirement of API 600 (cast valves) & API 602 (forged valves) for class 150, 300 and 600.

ASME B16.10 Face-to-Face Dimensions of Ferrous Valves

B16.10 specifies the face-to-face dimensions of all flanged and butt weld end valves. Screwed and socket weld end valve face-to-face dimensions are not included in this standard.

MSS SP-55 Quality Standard for Steel Castings for Valves, Flanges and Fittings and other Piping Components

MSS-SP-55 outlines the visual inspection criteria for castings (& forgings). This specification is listed as part of the procedure under API 598.

NACE MR-0175 Standard for Sour Service

Standard Material Requirements for Sulfide Stress Cracking Resistant Metallic Materials For Oilfield Equipment MR-0175 is the "standard" for materials used in "sour" environments such as found in piping systems in many refineries. It lists materials, mechanical properties and heat treatments for metals used in Hydrogen Sulfide bearing hydrocarbon service.

BS 1873 Specification for Steel Globe Valves

BS 1868 outlines specifications for flanged and buttweld end check valves for the petroleum petrochemical and allied industries. Valves made to BS P1868 usually dual conform to ANSI B16.34 wall thickness and other design criteria.

BS 1868 Specification for Steel Check Valves

BS 1868 outlines specifications for flanged and buttweld end check valves for the petroleum petrochemical and allied industries. Valves made to BS 1868 usually dual conform to ANSIB16.34 wall thickness and other design criteria.

ANSI/ASME STEEL GATE, GLOBE & CHECK VALVES

Cast Gate Valves - API600

For users of cast gate valves, API 600 is the key document. It details all design and material criteria. API 600 also lists important dimensions such as stem diameter minimums, wall thickness and stuffing box size. Cast, globe and check valves can also reference this standard for wall thickness and other design criteria. Another important gate valve standard is ASME B16.34. This standard outlines requirements on valves constructed to ASME boiler code pressure temperature ratings. One important area in which API 600 differs from ANSI B16.34 is minimum wall thickness. API 600 requires a heavier wall for a given pressure rating than does ASME B16.34. API 603 is optionally used for 150# and 300# stainless steel valves and allows a lighter wall thickness than API 600.

Cast Check Valves

Check valves can be manufactured to API 6D (Full opening pipeline check valves), BS 1868 or ANSI B16.34/API 600. Australian Pipeline Valve valves manufactured to BS 1868 also conform to ANSI B16.34 wall thickness and other design criteria.

Cast Globe Valves

Globe valves can be manufactured to BS 1873 or ANSI B16.34/API 600. Australian Pipeline Valve valves manufactured to BS 1873 also dual conforms to ANSI B16.34 wall thickness and other design criteria.

Forged Gate, Globe, Check Valves

Small forged carbon steel, gate, globe & check valves in 150#, 300#, 600#, 800# & 1500# class valves are covered by API 602. ANSI 150 to 2500 forged, check and globe valves can also be manufactured to BS 5352. Forged check, gate & globe valves in 2500# are also manufactured to ANSI B16.34. API 602 specification covers the same details for small forged valves that API 600 does for larger valves. API 602 also requires a heavier wall for 150#, 300# & 600# classes than does B16.34.

VALVE TEST STANDARDS

Main Valve Test Standards

API 598 Valve Inspection and Test

The most widely used test specification in the world. The standard covers all types of valves in sizes up to 600NB (NPS 24). It also includes leakage rates and testing criteria for metal-seated and resilient-seated valves.

BS6755 Valve Test Standard

Used by some European Manufacturers. It includes leakage rates and testing criteria for metal and resilient seated valves.

ASME B16.34 Valves – Flanged, Threaded and Welding End

The primary valve design standard, it also contains pressure/temperature charts for determining the working pressures of valves to be used in conjunction with other test standards, such as API 598.

ASME PTC 25 Pressure Relief Devices

The main reference document for the testing of pressure relief valves, PTC 25 contains detailed procedures for testing relief valves with air or steam.

API 527 Seat Tightness of Pressure Relief Valves

This covers the seat tightness of pressure relief valves. It also includes allowable leakage rates for testing with steam, water and air.

FC1 70-2 Control Valve Seat Leakage

This document contains detailed test procedures and leakage rate classes for control valves. The leakage classes are also occasionally referenced by other documents and used as acceptance criteria.

ISA S75 Hydrostatic Testing of Control Valves

This standard provides a procedure for the hydrostatic shell testing of control valves. Seat testing and acceptance criteria are out of the scope of this document and usually are covered by referencing FCI 70-2.

ISO 5208 Industrial Valves, Pressure Testing of Valves

ISO's primary testing standard, this document covers all types of valves and has four levels of allowable closure test leakage rates.

MSS SP70 Cast Iron Gate Valves, Flanged and Threaded Ends

The primary design standard for cast iron gate valves, it also contains testing procedures and acceptance criteria.

MSS SP71 Iron Swing Check Valves, Flanged and Threaded Ends

The primary design standard for cast iron check valves also contains testing procedures and acceptance criteria.

MSS SP61 Hydrostatic Testing of Steel Valves

Similar to API 598, this document has some minor variations in test holding times and leakage rates.

MSS SP78 Cast Iron Plug Valves, Flanged and Threaded Ends

The primary design standard for cast iron plug valves also contains testing procedures and acceptance criteria.

MSS SP80, Bronze Gate, Globe, Angle and Check Valves

The primary design standard for commodity bronze valves also contains testing procedures and acceptance criteria.

MSS SP85, Cast Iron Globe & Angle Valves

The primary design standard for cast iron globe valves also contains testing procedures and acceptance criteria.

Common valve types related test standards

Valve type	Common test standard
Steel gates, globes and checks	API 598
Steel ball, gate, globe, check	BS6755
Cast Iron gates	API 598, MSS SP-70
Bronze gates, globes and checks	MSS SP-80
Steel valves larger than NPS 24"	ASME B16.34
Pressure seal valves	ASME B16.34
Pipeline valves	API 6D
Cast iron checks	API 598, MSS SP-71
Cast iron globes	API 598, MSS SP-85
Cast iron plugs	API 598, MSS SP-78
Steel ball valves	API 598
Steel butterfly valves	API 598
Cryogenic valves	API 598, BS 6364
Control valves	FCI 70-2, ISA-S75,
Pressure relief valves	API 527, ASME PTC 25

Common Valve Abbreviations

Organisations/Societies			
ANSI	American National Standards Institute	API	American Petroleum Institute
ASME	American Society of Mechanical Engineers	ASTM	American Society for Testing Materials
BS	British Standards	DIN	Deutsche Industrie - Normen
BVQI	Bureau Veritas Quality International	ISO	International Standards Organisation
Valve Materials			
Br	Bronze	A.I.	All Iron
C.I.	Cast Iron	M.I.	Malleable Iron
N.I.	Nickel Iron	D.I.	Ductile Iron
C.S.	Cast Steel/Carbon Steel	F.S.	Forged Steel
S.S.	Stainless Steel	PVC	Polyvinyl Chloride
N	Nickel	M	Monel
Mo	Molybdenum	Al	Aluminium
Cr	Chromium	Tef	Teflon
13% Cr	Type 410 Stainless Steel	HF	Hard Face (Stellite Face)
Operating Mechanisms			
O.S. & Y	Outside Screw & Yoke	N.R.S.	Non Rising Stem
R.S.	Rising Stem		
End Connections			
F.E.	Flanged Ends	S.E.	Screwed Ends
F.F.D.	Flanged, Faced & Drilled	B.W.	Butt Welding Ends
S.W.	Socket Welding Ends	Scr.	Screwed Ends
Flg.	Flanged Ends	S.J.	Solder Ends

Links

- American Petroleum Institute – www.api.org
- American Standards Association – <http://www.ansi.org>
- American Society of Mechanical Engineers – www.asme.org
- British Standards Institution – www.bsi-global.com
- Fluid Controls Institute – <http://www.fluidcontrolsinstitute.org>
- International Organisation for Standardisation – <http://www.iso.org>
- ISA (Instrumentation, Systems and Automation Society of America) – www.isa.org
- Manufacturers Standardization Society of the Valve and Fittings Industry – www.mss.hq.com

We can manufacture exotic grades like Nickel, Super Duplex F55 and Monel (ASTM A494-M35-1), Cd4M-Cu, Hastelloy C (ASTM A-494 CW12MW), 317 (C8G8M) in short lead-time.

For other ANSI, ASME, ISO, API, BS, API valve related technical cross reference charts and tables relating to standards, codes, pressure, temperature, application, suitability, equivalents, body & trim materials, valve manufacturing & test standards, etc., go to the technical section of our website: <http://www.australianpipelinevalve.com.au>

We manufacture valves in API600, API602, API6D, BS1868, API603, API6A and numerous other standards including Ball, Butterfly, Check, Gate, Globe, Needle and Plug valves.

Go to our website for more valve and piping technical references.

At Australian Pipeline Valve (APV) the same knowledge and effort we put into the web site goes into every product we sell. If this web site helps you, please reward APV with your business, tell your engineers, plant managers, purchasing officers and project managers about us!

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