

Design Specifications



1. Basic Design Standards

- a. **In addition to the specific industry standard noted herein as a minimum the valve design will meet the applicable requirements of the following industry standards.**
 - i. ASME B16.34 including the pressure / temperature ratings for valve body, disc and bottom cap materials: valve body minimum wall dimensions: nondestructive examination and markings.
 - ii. API STD 609 including basic design requirements applicable to Category B HP Butterfly Valves.
 - iii. API STD 598 including hydrostatic shell and hydrostatic and pneumatic seat testing.
 - iv. API STD 607, latest edition for fire testing.
 - v. MSS -SP- 55 for visual inspection of cast valve body, disc and bottom cap.
 - vi. ASME B16.5 for mating pipe flange dimensions for valve sizes 3" through 24" Class 150 & 300.
 - vii. ASME B16.47 for series B mating pipe flange dimensions for valve sizes 26" and larger Class 150 & 300.
 - viii. ISO-5752 Flange Dimension

2. Face-To-Face Dimensions

- a. **Lug Design – nominal dimension listed in API STD 609 Table 2 for category B valves.**
- b. **Wafer Design – nominal dimension listed in API STD 609 Table 2 for category B valves.**
- c. **Flanged (double flanged, short pattern) – nominal dimension in API STD 609, Table C and ISO 5752 basic series 13.**
- d. **Flanged (double flanged, long pattern) – nominal dimension in API STD 609 , Table B and to Gate Valve Dimensions per ANSI 16.10 table A1 Column 7 for 150# valves and Table A2 Column 10 for 300# Valves**

3. Seat Leakage Performance

- a. **Each valve exhibits the seat leakage performance as follows:**
 - i. Preferred side (pressure entering the valve on the shaft side of the shut disc) - zero seat leakage at the low pressure and high pressure test. Each valve shall have an arrow on the external valve body indicating the direction of high pressure.
 - ii. Non preferred side (pressure entering the valve with the shaft on the opposite side of the shut disc) only – zero seat leakage at the low pressure closure test per API 598. High pressure closure test on application.
 - iii. Shell Test – Each unpainted valve assembly is hydrostatically shell tested in accordance with the applicable test requirements stated in API STD 598.
 - Test Fluid – Filtered clean water (may contain a water- soluble oil or rust inhibitor). When testing austenitic stainless steel valves the chloride content does not exceed 100 parts per million.
 - Test Leakage – No visually detectable leakage through the pressure boundary walls. Leakage through the adjustable shaft packing shall not be cause for rejection. However the packing must be able prevent any leakage at a test pressure equal to the 100°F (38°C) valve body rating.
 - Standard Production Seat Leakage Test – Each production valve assembly, unless otherwise stated on the purchase order, shall be seat tested In accordance with the requirements listed in API STD 598, Table 1-A as follows:
 - Test Leakage – Each valve tested shall exhibit zero leakage (no visible bubbles) for the duration of the test period.
 - Fugitive Emissions Testing – Valves are capable of passing the fugitive emissions test requirements of ISO-15848-1.



Materials of Construction

Standard Cast Steel & Stainless Steel Valve Assemblies

Assy No.	Component	Carbon Steel Assembly	Stainless Steel Assembly
1	Screw	A193 B8M Class 1	A193 B8M Class 1
2	Body*	A216 Gr. WCB	A351 Gr. CF8M
3	Bottom Cap	A105	316 Sst
4	Shaft Bearing	316 SST/Nitrited	316 SST/Nitrited
5	Disc	A216 Gr. WCB	A351 Gr.Cf8m
6	Pin	17-4ph Cond. H1150D	17-4ph Cond. H1150D
7	Bearing Seal	Graphite	Graphite
8	Shaft Bearing	316 SST/Nitrited	316 SST/Nitrited
9	Bearing Seal	Graphite	Graphite
10	Packing Stud	A193 B8m Class 1	A193 B8m Class 1
11	Hex Nut	A194 8m	A194 8m
12	Yoke	A216 Gr. WCB	A216 Gr. WCB
13	Key	1045	1045
14	Manual Gear	Mfr Std	Mfr Std
15	Gear Stud	A193 B7	A193 B7
16	Hex Nut	A194 2h	A194 2h
17	Yoke Stud	A193 B7	A193 B7
18	Hex Nut	A194 2h	A194 8m
19	Gland Follower	A216 Gr. WCB	A216 Gr. WCB
20	Packing Gland	316 SST	ST
21	Shaft Packing	Graphite	Graphite
22	Shaft	17-4ph Cond. H1150D	17-4ph Cond. H1150D
23	Split Ring	316 SST	316 SST
24	Gasket Ring	316 SST/Graphite	316 SST/Graphite
25	Seal Ring	316 SST/Graphite	316 SST/Graphite
26	Retainer	A105	316 SST
27	Retainer Screw	A193 B8m Class 1	A193 B8m Class 1

*Stellite seat overlay in valve body

Shaft Packing

The stem packing top and bottom end rings are an interlaced, braided, graphite filament with a non-metallic inorganic passivating corrosion inhibitor. The middle rings of the packing set shall a compressed flexible graphite material.

Valve End Facing

All valve end faces shall be standard 1/16" raised face for class 150 and 300 valves per ANSI B16.5

Certifications

- a. Certified material test reports with traceability by a heat number are provided for each valve body, cap, disc and shaft.
- b. A certificate of compliance is provided for each valve assembly certifying compliance with the applicable purchase order requirements and to the design standards and testing noted herein.

When requested on the purchase order a certified shell and seat leakage test report shall also be included in the document package.

