



PROVIDING COMPLETE CONTROL
SOLUTIONS FOR
INDUSTRIAL APPLICATIONS

CAST STEEL GATE, GLOBE, CHECK VALVE



FZV-Ref-2017. 11





FZV is a specialized supplier of API 6D, API 600, API 623, API 594 valves and flow control components, including industrial valves and wellhead equipment.

FZV is approved by major oil and gas companies including: Shell, Chevron, BP, Vopak, CNPC, Sinopec, CNOOC, ENI, PDO, Petronas, Sasol and Santos. Our approvals also include numerous EPC's in the oil & gas, power and mining sectors, such as Worley Parsons, Technip, Fluor, Samsung, Hyundai, JGC, and Chiyoda. We continue to work with our partners to expand our customer base due to unwavering commitment to our client's needs. We strive to meet or exceed expectations. "Quality, excellence AND unmatched service" is always the basis of our mission.

FZV is certified by ISO 9001, ISO 14001, OHSAS 18001, API Q1, API 6D, API 600, ATEX, CE/PED and API 607.

Established in 1983, with manufacturing locations in Shanghai and Wenzhou, China, we continue to grow and have become a global leader in manufacturing high quality valves and wellhead equipment. We offer excellent customer service and excel at meeting our customers' expectations.

Growth is important to FZV, we have therefore established our own laboratory for research and development aimed at product design, innovation and validation. We have complete in house inspection facilities and test equipment to ensure that all products are of the highest quality. FZV in-house test capability includes mechanical: tensile, impact and hardness testing; NDE: PT, MT, UT; chemical: PMI; Cryogenic fugitive emissions; and shell type acceptance test (TAT). We simulate various tests in critical and crucial working conditions to verify product performance.



API 600-0039



API Q1-1819



ISO 9001



ISO 15848



API 624

CAST STEEL GATE, GLOBE, CHECK VALVE

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FZV is proud to produce Cast Steel Gate and Globe valves that meet the latest API 624 Specification: "Type Testing of Rising Stem Valves Equipped with Graphite Packing for Fugitive Emissions". In order to meet the API 624 specification the graphite packing used in the valves must be from a handful of graphite packing manufacturers that have met the stringent API 622 Specification: "Type Testing of Process Valve Packing for Fugitive Emissions". FZV has selected A.W. Chesterton Company (Chesterton) from Groveland, Massachusetts as the manufacturer of the graphite packing used in the manufacture of FZV™ Cast Steel Gate and Globe valves.



Chesterton has successfully passed the API 622 testing standards that includes high pressure testing at ambient and high temperatures with methane over 5 thermal cycles and 1500 mechanical cycles with only one packing adjustment allowed. The acceptance criteria is that the packing emissions must not exceed 100 ppmv. The testing includes Corrosion testing at ambient temperature in high humidity and high pressure for 28 days and high temperature steam at high pressure for 35 days to ensure the minimal weight loss.

The graphite packing is also tested for material composition and properties to ensure the proper density, lubricant content with minimal weight loss and leachable materials. Once Chesterton attained their certification to API 622 they became authorized to provide API 624 testing and certification in their USA facility for gate and globe valves supplied by valve manufacturers worldwide.

The details of the API 624 parameters and requirements of the FE testing conducted by Chesterton on FZV's valves are as follows:

Type Testing: Based upon the elements of EPA Method 21 (United States Environmental Protection Agency)

Valves Qualified: All sizes up to and including 24" / 600mm - All classes up to and including 1500

Valve Operating Temperature Range: -29 C to 538 C / -20 F to 1000 F

Test Medium: Dry methane gas at 97% minimum purity.

Test Pressure: 600 psi / 4.13 MPa

Test Temperature: Ambient and 260 C / 500 F

Thermal Cycles: 3

Mechanical Cycles: 310

FE Testing: Static and dynamic conditions, taken at stem and packing outside diameters every 50 cycles.



Acceptance Criteria: Not exceeding

Fugitive Emission Testing

FZV conducts fugitive emission testing for the evaluation of external leakage of valve stems or shafts and body joints of isolating valves and control valves intended for application with volatile air pollutants and hazardous fluids.

FE testing of sample standard production valves is conducted where fugitive emission standards are specified.

Fugitive Emission Testing available at the FZV Factory.

At FZV's laboratory in the Wenzhou factory we are able to provide additional Fugitive Emission Testing as requested by our customers. Two of these testing standards are:

- ISO 15848-2: Industrial Valves – Measurement, test and qualification procedures for fugitive emissions – Production acceptance test of valves.
- Shell MESC 77/312: Fugitive emission production testing (amendments/supplements to ISO 15848-2) and the accompanying procedure and technical specification for type acceptance testing (TAT) of industrial valves.

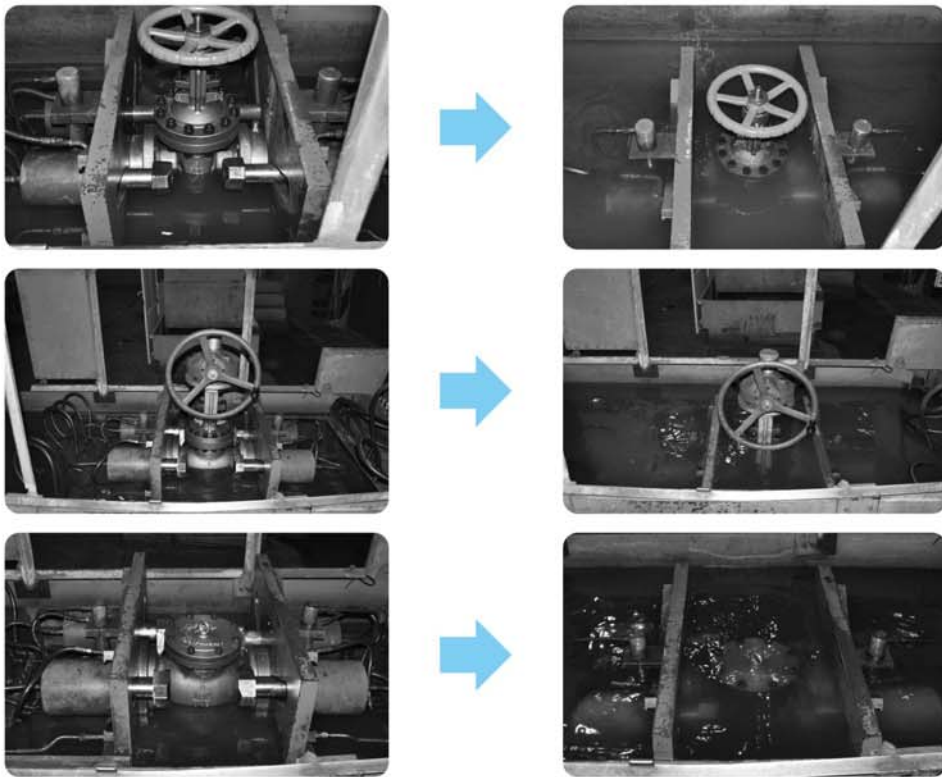


In-house laboratory at the main factory capable of High Temperature , Low Temperature, Cryogenic, Fugitive Emission testing and more.

QUALITY CONTROL

PNEUMATIC SHELL TEST

For Cast Steel Gate, Globe and Check Valves, the body casting integrity is tested for small leaks which are difficult to detect during the required hydrotest by performing a High Pressure Pneumatic Shell test on all valves. The test is performed by submerging the valves in water and pressure testing the valves with compressed air or nitrogen. Any pinholes in the casting are easily spotted as gas bubbles in the water.



PNEUMATIC SHELL TEST DETAILS

NPS	DURATION (MINUTES)	CLASS	TEST PRESSURE (MPa/Psi)
1/2-4	4	150	2/300
		300	4/575
6-10	10	600	5/725
		900	5/725
12-18	20	1500	15/2175
		2500	25/3625
≥20	30		

CAST STEEL VALVE MANUFACTURING PROGRAM

CAST GATE, GLOBE & CHECK VALVES

VALVE TYPE		API 600 GATE VALVE																				
CLASS \ SIZE(in/mm)	2/50	2 1/2/65	3/80	4/100	6/150	8/200	10/250	12/300	14/350	16/400	18/450	20/500	24/600	28/700	30/750	32/800	36/900	40/1000	42/1100	48/1200	54/1350	60/1500
150	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
300	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
600	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
900	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1500	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
2500	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

VALVE TYPE		API 623 GLOBE VALVE																				
CLASS \ SIZE(in/mm)	2/50	2 1/2/65	3/80	4/100	6/150	8/200	10/250	12/300	14/350	16/400	18/450	20/500	24/600	28/700	30/750	32/800	36/900	40/1000	42/1100	48/1200	54/1350	60/1500
150	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
300	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
600	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
900	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1500	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
2500	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

VALVE TYPE		API 594 CHECK VALVE																				
CLASS \ SIZE(in/mm)	2/50	2 1/2/65	3/80	4/100	6/150	8/200	10/250	12/300	14/350	16/400	18/450	20/500	24/600	28/700	30/750	32/800	36/900	40/1000	42/1100	48/1200	54/1350	60/1500
150	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
300	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
600	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
900	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1500	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
2500	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



HOW TO ORDER

Type	Size	Ends	ASME Class	Body	API Trim	Operator	Designator	Service
1	2	3	4	5	6	7	8	9

1 Type

GA = GATE
GL = GLOBE
SC = SWING CHECK
PC = PISTON CHECK
TD = Tilting Disk Check
DP = Dual Plate Check
ST = Stop check
GY = Y-Pattern Globe

2 Size

2=2"	14=14"	40=40"
25=2 1/2"	16=16"	42=42"
3=3"	18=18"	48=48"
4=4"	20=20"	54=54"
5=5"	22=22"	60=60"
6=6"	24=24"	
8=8"	28=28"	
10=10"	30=30"	
12=12"	36=36"	

3 Ends

R = RF
J = RTJ
C = RF X BW
A = RF Smooth Finish
B=BW (followed by Schedule)

4 ASME Class

1 = 150
3 = 300
6 = 600
9 = 900
15 = 1500
25 = 2500

5 Body

W=WCB	G=CF3M(316L)
L= LCC	H=CN7M
S= CF8M (316)	I= CF8C (347SS)
A= WCC	J=Duplex
B=LCB	K=Super Duplex
C=WC6	M=Monel
D=WC9	
E=C5	
F=CF3 (304L)	

6 API Trim

As Per API

7 Operator

H = Handwheel
G = Gear
B = Barestem

8 Designator

Put dash in number system before service if applicable

9 Service

N = NACE
C = Cryogenic
B = Buried

Notes: X designates Special in all fields (refer to description for details) this would be on bottom of figure number matrix

Example valve figure number: GA12R1W8G-N

Gate valve, 12", rasied face end connection, 150ASME, WCB Body, Trim: 8#, Gear operator, NACE

GATE VALVE



STANDARD FOR DESIGN AND MANUFACTURE

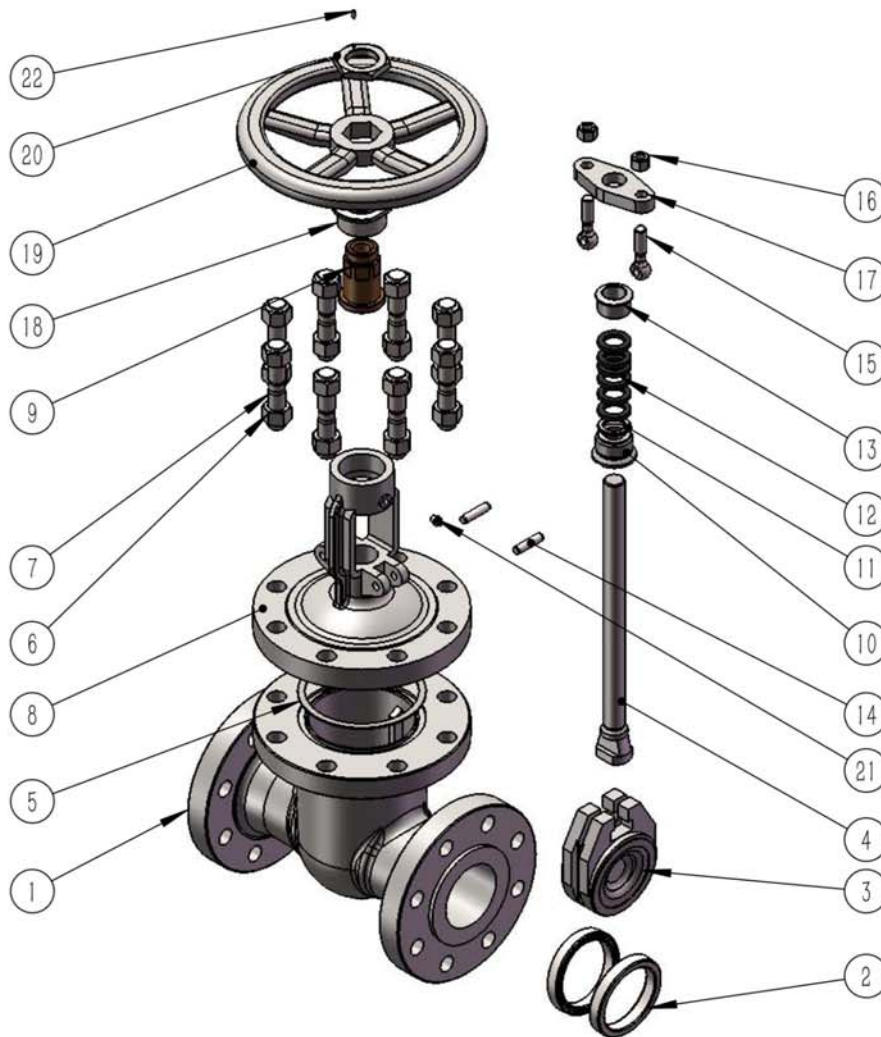
Designed and Manufactured in accordance with: API 600, ASME B16.34, ISO 10434, API 624

Face to Face in accordance with: ASME B16.10

Connection Dimension in accordance with: ASME B16.5, ASME B16.47, ASME B16.25,

Inspection and Test Following: ISO 5208, API 598

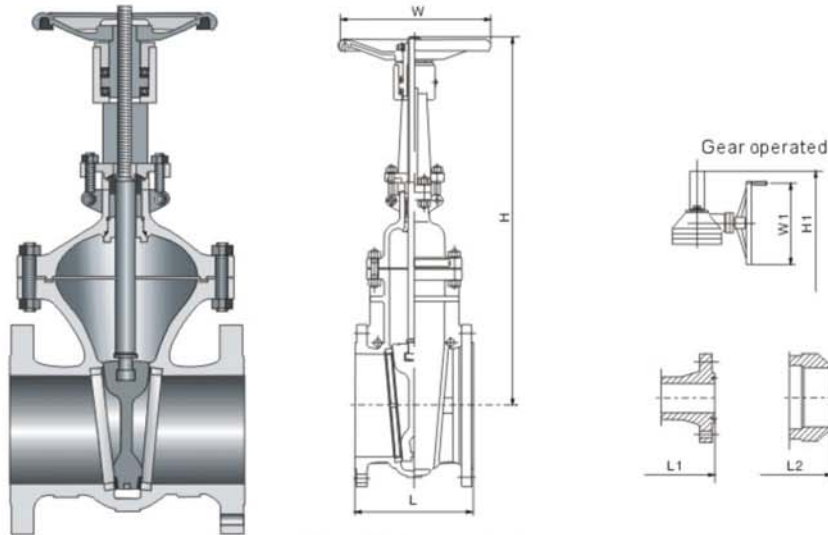
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|-----------------|-----------------|-----------------|---------|
| ① Body | ⑧ Bonnet | ⑮ Eyelet Bolt | ⑳ Screw |
| ② Seat | ⑨ Stem Nut | ⑯ Nut | |
| ③ Gate | ⑩ Back Seat | ⑰ Gland Flange | |
| ④ Stem | ⑪ Spacer Ring | ⑱ Bearing Cover | |
| ⑤ Bonnet Gasket | ⑫ Packing | ⑲ Handwheel | |
| ⑥ Bonnet Nut | ⑬ Packing Gland | ⑳ Locking Nut | |
| ⑦ Bonnet Stud | ⑭ Straight Pin | ㉑ Grease Nipple | |



API pressure test(Mpa/PSI)				
Class	Back seat test	Shell test	High pressure seal test	Low pressure seal test
150	2.2/314	2.9/428	2.2/314	
300	5.6/814	7.7/1110	5.6/814	
600	11.2/1628	15.3/2220	11.2/1628	
900	16.7/2442	23/3330	16.7/2442	0.6/87
1500	28.1/4076	38.3/5558	28.1/4076	
2500	46.8/6787	63.8/9255	46.8/6787	

Common Materials								
PART NAME	CARBON STEEL		ALLOY STEEL		STAINLESS STEEL			
Body	A216 WCB	A352 LCC	A217 WC6	A217 WC9	A351 CF8	A351 CF8M	A351 CF3	A351 CF3M
Bonnet	A216 WCB	A352 LCC	A217 WC6	A217 WC9	A351 CF8	A351 CF8M	A351 CF3	A351 CF3M
Disc	A216 WCB+13Cr	A352 LCC+316	A217 WC6+STL	A217 WC9+STL	A351 CF8	A351 CF8M	A351 CF3	A351 CF3M
Seat	A105N+STL	A350 LF2+STL	A182 F11+STL	A182 F22+STL	A182 F304+STL	A182 F316+STL	A182 F304L+STL	A182 F316L+STL
Stem	A182 F6a	A182 F316	A182 F6a	A182 F6a	A182 F304	A182 F316	A182 F304L	A182 F316L
Stud	A193 B7	A320 L7M	A193 B16	A193 B16	A193 B8	A193 B8M	A193 B8	A193 B8M
Nut	A194 2H	A194 7M	A194 7	A194 7	A194 8	A194 8M	A194 8	A194 8M
Back seat	A182 F6a	A182 F316	A182 F6a	A182 F6a	A182 F304	A182 F316	A182 F304L	A182 F316L
Gland ring	A276 410	A276 316	A276 410	A276 410	A276 304	A276 316	A276 304L	A276 316L

Not: 1. All material in accordance with ASTM standards
2. Additional material available upon request

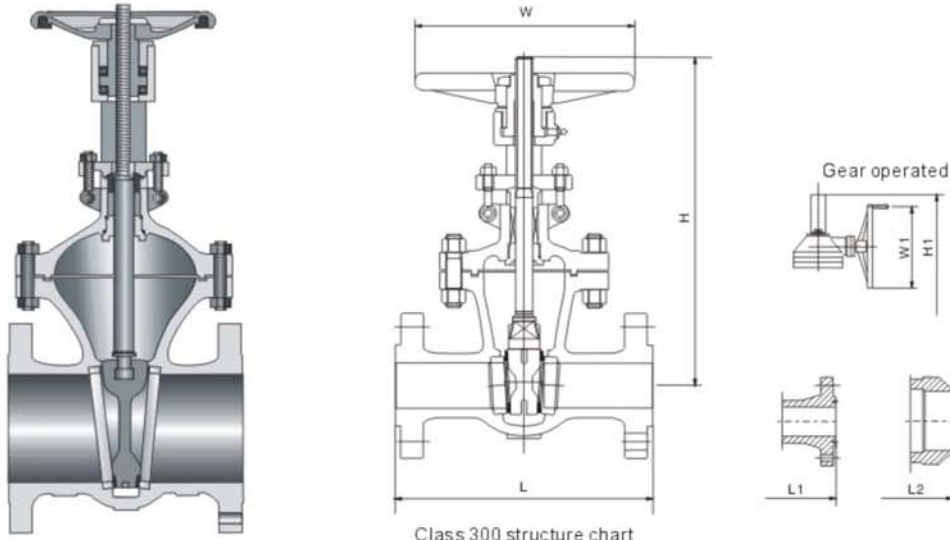


Class 150 structure chart

CLASS 150

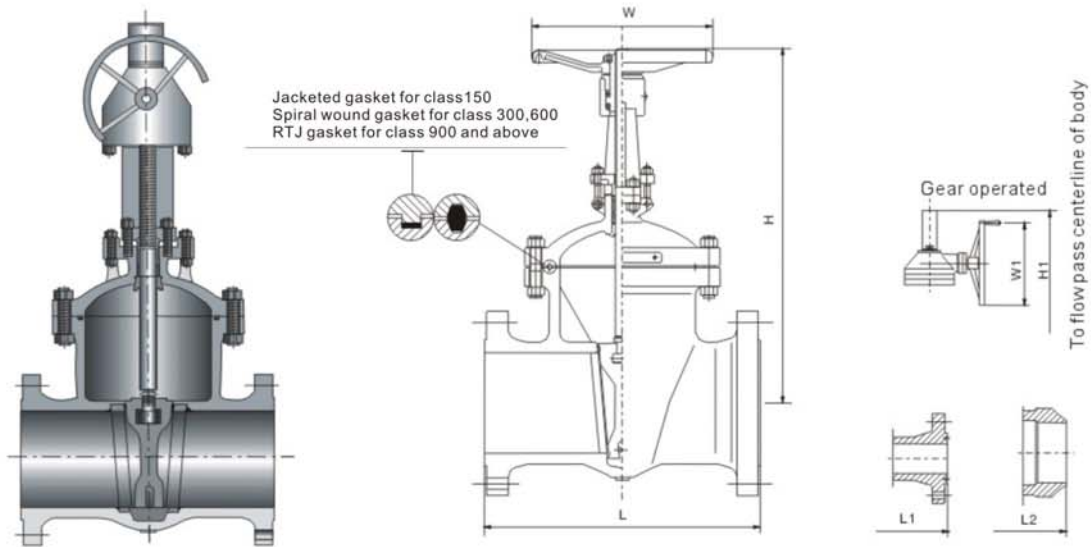
Bore		L	L1	L2	H	W	H1	W1	T	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	N.m	kg/lb
2	50	178/7	191/7.5	216/8.5	340/13.4	250/9.8			15	21/46
2-1/2	65	190/7.5	203/8	241/9.5	400/15.8	250/9.8			20	25/55
3	80	203/8	216/8.5	283/11.1	403/15.9	280/11			24	30/66
4	100	229/9	242/9.5	305/12	447/17.6	300/11.8			42	42/92
5	125	254/10	267/10.5	381/15	544/21.4	300/11.8			60	60/132
6	150	267/10.5	280/11	403/15.9	600/23.6	350/13.9			76	75/165
8	200	292/11.5	305/12	419/16.5	745/29.3	400/15.8			124	120/264
10	250	330/13	343/13.5	457/18	900/35.4	400/15.8	1280/50.4	310/12.2	204	205/451
12	300	356/14	368/14.5	502/19.8	1058/41.7	500/19.7	1524/60	310/12.2	270	270/595
14	350	381/15	394/15.5	572/22.5	1224/48.2	600/23.6	1600/63	310/12.2	360	420/925
16	400	406/16	419/16.5	610/24	1345/53	600/23.6	1795/70.7	460/18.1	485	550/1212
18	450	432/17	445/17.5	660/26	1487/58.5	600/23.6	2045/80.5	460/18.1	620	650/1433
20	500	457/18	470/18.5	711/28	1630/64.2	680/26.8	2275/89.6	460/18.1	830	789/1739
24	600	508/20	521/20.5	813/32	1931/76	800/31.5	2675/105.3	530/20.9	1435	1200/2645
26	650	559/22		864/34			2980/117.3	600/23.6	1572	1550/3417
28	700	610/24		914/36			3174/125	600/23.6	1820	1800/3968
30	750	610/24		914/36			3406/134.1	600/23.6	2070	2560/5643
32	800	660/26		965/38			3515/138.4	600/23.6	2760	3060/6746
36	900	711/28		1016/40			3920/154.3	600/23.6	3620	3500/7716

* Additional sizes available upon request.



CLASS 300										
Bore		L	L1	L2	H	W	H1	W1	T	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	N.m	kg/lb
2	50	216/8.5	232/9.1	216/8.5	340/13.4	250/9.8			25	30/66
2-1/2	65	241/9.5	257/10.1	241/9.5	390/15.4	250/9.8			43	36/79
3	80	282/11.1	298/11.7	282/11.1	412/16.2	280/11.0			55	47/103
4	100	305/12	321/12.6	305/12	450/17.7	300/11.8			80	69/152
5	125	381/15	397/15.6	381/15	570/22.4	350/13.8			120	89/196
6	150	403/15.9	419/16.5	403/15.9	618/24.3	400/15.8			165	123/271
8	200	419/16.5	435/17.1	419/16.5	760/29.9	450/17.7			295	196/432
10	250	457/18	473/18.6	457/18	937/36.9	500/19.7	1375/54.1	310/12.2	458	333/734
12	300	502/19.8	518/20.4	502/19.8	1090/42.9	600/23.6	1494/58.8	460/18.1	686	440/970
14	350	762/30	778/30.6	762/30	1265/49.8	700/27.6	1738/68.4	460/18.1	810	710/1565
16	400	838/33	854/33.6	838/33	1370/53.9	700/27.6	1880/74.0	460/18.1	1100	950/2094
18	450	914/36	930/36.6	914/36	1510/59.5	800/31.5	2110/83.1	460/18.1	1490	1405/3097
20	500	991/39	1010/39.6	991/39	1710/67.3	800/31.5	2310/90.9	460/18.1	1805	1720/3791
24	600	1143/45	1165/45.9	1143/45			2809/110.6	600/23.6	3025	2770/6106
26	650	1245/49	1270/50	1245/49			2895/117.5	600/23.6	3600	3450/7605
28	700	1346/53	1371/54	1346/53			3178/125.1	600/23.6	5306	3312/7301
30	750	1397/55	1422/56	1397/55			3396/133.7	600/23.6	6065	4100/9038
32	800	1524/60	1552/61	1524/60			3700/145.7	600/23.6	7115	5200/11463
36	900	1727/68	1755/69.1	1727/68			4115/162.0	600/23.6	9350	6700/14770

* Additional sizes available upon request.



CLASS 600

Bore		L	L1	L2	H	W	H1	W1	T	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	N.m	kg/lb
2	50	292/11.5	295/11.6	292/11.5	375/14.7	250/9.8			45	39/86
2-1/2	65	330/13	333/13.1	330/13	410/16.1	250/9.8			70	52/114
3	80	356/14	359/14.1	356/14	463/18.2	300/11.8			98	88/194
4	100	432/17	435/17.1	432/17	574/22.6	350/13.8			158	114/251
6	150	559/22	562/22.1	559/22	713/28.1	500/19.7	958/37.7	310/12.2	417	285/628
8	200	660/26	663/26.1	660/26	874/34.4	600/23.6	1178/46.4	460/18.1	645	413/910
10	250	787/31	790/31.1	787/31	995/39.2	600/23.6	1362/53.6	460/18.1	1025	650/1433
12	300	838/33	841/33.1	838/33	1140/44.9	700/27.6	1551/61.1	520/20.5	1689	800/1763
14	350	889/35	892/35.1	889/35	1275/50.2	700/27.6	1630/64.2	520/20.5	2100	1140/2513
16	400	991/39	994/39.1	991/39			2035/80.1	600/23.6	2465	1700/3747
18	450	1092/43	1095/43.1	1092/43			2140/84.3	600/23.6	3185	2268/5000
20	500	1194/47	1200/47.6	1194/47			2360/92.9	600/23.6	4185	2850/6283
24	600	1397/55	1407/55.4	1397/55			2840/111.8	600/23.6	7000	3500/7716

* Additional sizes available upon request.

CLASS 900										
Bore		L	L1	L2	H	W	H1	W1	T	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	N.m	kg/lb
2	50	368/14.5	371/14.6	368/14.5	469/18.5	300/11.8			90	72/158
2-1/2	65	419/16.5	422/16.6	419/16.5	512/20.2	350/13.8			120	101/222
3	80	381/15	384/15.1	381/15	513/20.2	350/13.8			167	130/286
4	100	457/18	460/18.1	457/18	613/24.1	400/15.8			245	197/434
6	150	610/24	613/24.1	610/24	834/32.8	600/23.6	1025/40.4	310/12.2	636	404/890
8	200	737/29	740/29.1	737/29	835/32.9	600/23.6	1160/45.7	460/18.1	980	650/1433
10	250	838/33	841/33.1	838/33	1040/40.9	650/25.6	1520/59.8	460/18.1	1728	850/1873
12	300	965/38	968/38.1	965/38	1150/45.3	700/27.6	1720/67.7	460/18.1	2600	1177/2594
14	350	1029/40.5	1038/40.9	1029/40.5			1795/70.8	600/23.6	3550	1500/3306
16	400	1130/44.5	1140/44.9	1130/44.5			1908/75.1	600/23.6	6950	1920/4232

CLASS 1500										
Bore		L	L1	L2	H	W	H1	W1	T	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	N.m	kg/lb
2	50	368/14.5	371/14.6	368/14.5	469/18.5	300/11.8			131	85/187
2-1/2	65	419/16.5	422/16.6	419/16.5	546/21.5	350/13.8			190	130/286
3	80	470/18.5	473/18.6	470/18.5	550/21.7	400/15.8			272	170/374
4	100	546/21.5	549/21.6	546/21.5	752/29.6	550/21.7	937/36.9	460/18.1	471	304/670
6	150	705/27.8	711/28	705/27.8			1166/45.9	460/18.1	1010	646/1424
8	200	832/32.8	842/33.1	832/32.8			1370/53.9	460/18.1	2025	1100/2425
10	250	991/39	1000/39.4	991/39			1550/61.1	600/23.6	3260	1600/3527
12	300	1130/44.5	1146/45.1	1130/44.5			1800/70.9	600/23.6	4435	2106/4642
14	350	1257/49.5	1276/50.3	1257/49.5			2200/86.6	600/23.6	6900	2700/5952
16	400	1384/54.5	1406/55.4	1384/54.5			2550/100.4	600/23.6	8700	3500/7716

CLASS 2500										
Bore		L	L1	L2	H	W	H1	W1	T	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	N.m	kg/lb
2	50	451/17.8	454/17.9	451/17.8	565/22.2	350/13.8			185	124/273
3	80	578/22.8	584/23	578/22.8	696/27.4	400/15.8			295	252/555
4	100	673/26.5	683/26.9	673/26.5			977/38.5	460/18.1	580	490/1080
6	150	914/36	927/36.5	914/36			1100/43.3	530/20.9	1480	1200/2645
8	200	1022/40.3	1038/40.8	1022/40.3			1290/50.8	600/23.6	2980	2400/5291
10	250	1270/50	1292/50.9	1270/50			1470/57.9	600/23.6	5850	4550/10030
12	300	1422/56	1445/56.9	1422/56			1700/66.9	700/27.6	8350	6000/13227

* Additional sizes available upon request.



GLOBE VALVE



STANDARD FOR DESIGN AND MANUFACTURE

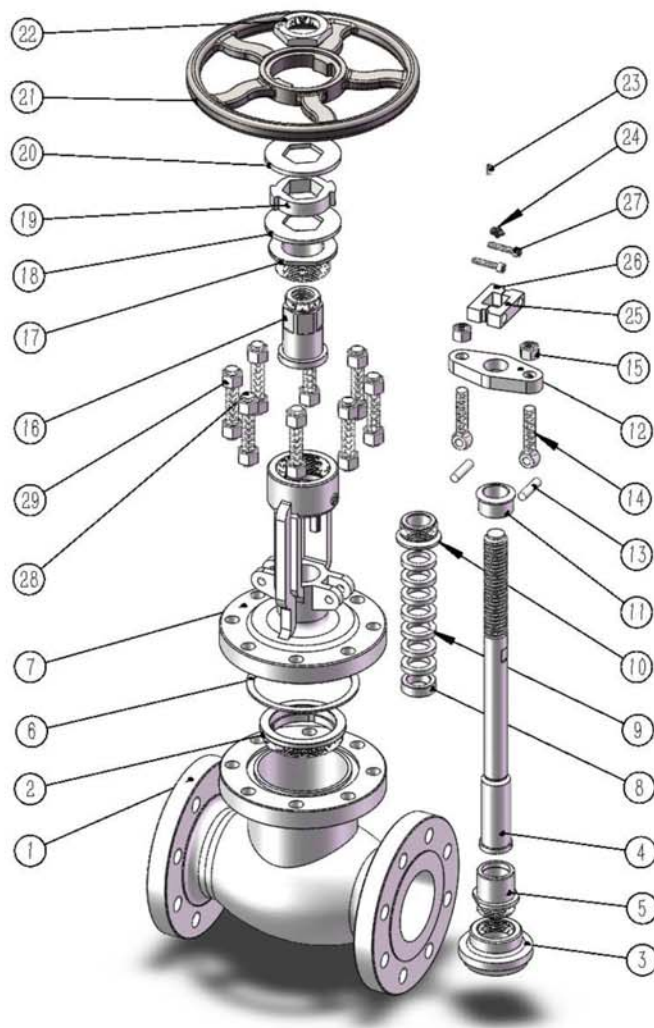
Designed and Manufactured in accordance with: API 623, ASME B16.34, API 624

Face to Face in accordance with: ASME B16.10

Connection Dimension in accordance with: ASME B16.5, ASME B16.25

Inspection and Test in accordance with: ISO 5208, API 598

- | | | | |
|-----------------|----------------|--------------------|------------------|
| ① Body | ⑨ Packing | ⑰ Bearing Cover | ⑳ Guide Block I |
| ② Seat | ⑩ Back Seat | ⑱ Supporting Plate | ㉑ Guide Block II |
| ③ Disc | ⑪ Nut | ㉒ Impact Block | ㉓ Screw |
| ④ Stem | ⑫ Gland Flange | ㉔ Retaining Plate | ㉕ Bonnet Stud |
| ⑤ Disc Cover | ⑬ Pin | ㉖ Handwheel | ㉗ Bonnet Nut |
| ⑥ Bonnet Gasket | ⑭ Eyelet Bolt | ㉘ Handwheel Nut | |
| ⑦ Bonnet | ⑮ Nut | ㉙ Screw | |
| ⑧ Spacer Ring | ⑯ Stem Nut | ㉚ Grease Nipple | |



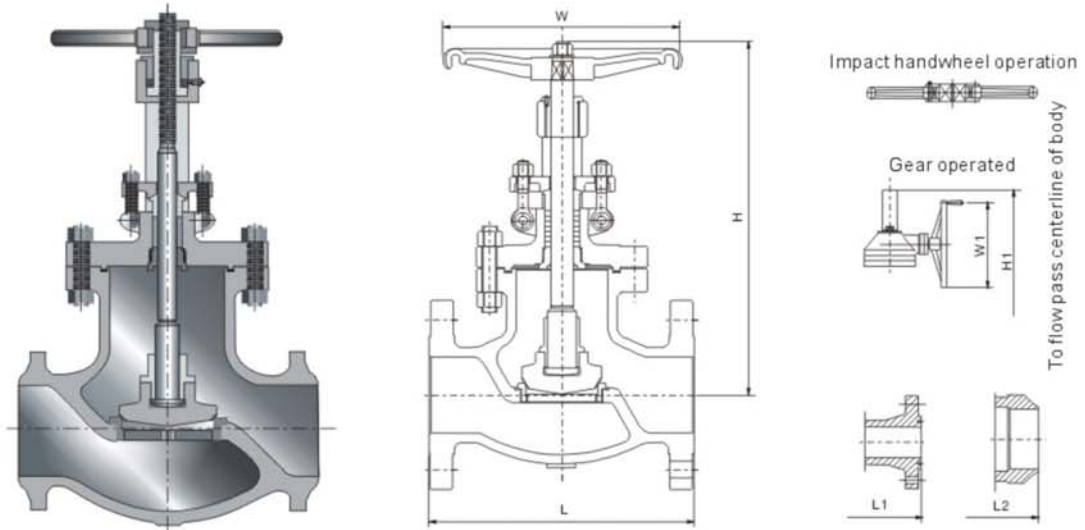
API pressure test(Mpa/PSI)

Class	Back seat test	Shell test	High pressure seal test	Low pressure seal test
150	2.2/314	2.9/428	2.2/314	
300	5.6/814	7.7/1110	5.6/814	
600	11.2/1628	15.3/2220	11.2/1628	
900	16.7/2442	23/3330	16.7/2442	0.6/87
1500	28.1/4076	38.3/5558	28.1/4076	
2500	46.8/6787	63.8/9255	46.8/6787	

Common Materials

PART NAME	CARBON STEEL		ALLOY STEEL		STAINLESS STEEL			
Body	A216 WCB	A352 LCC	A217 WC6	A217 WC9	A351 CF8	A351 CF8M	A351 CF3	A351 CF3M
Bonnet	A216 WCB	A352 LCC	A217 WC6	A217 WC9	A351 CF8	A351 CF8M	A351 CF3	A351 CF3M
Disc	A105N+STL	A350 LF2+STL	A182 F11+STL	A182 F22+STL	A182 F304+STL	A182 F316+STL	A182 F304L+STL	A182 F316L+STL
Seat	A105N+13Cr	A350 LF2+316	A182 F11+STL	A182 F22+STL	A182 F304	A182 F316	A182 F304L	A182 F316L
Stem	A182 F6a	A182 F316	A182 F6a	A182 F6a	A182 F304	A182 F316	A182 F304L	A182 F316L
Stud	A193 B7	A320 L7M	A193 B16	A193 B16	A193 B8	A193 B8M	A193 B8	A193 B8M
Nut	A194 2H	A194 7M	A194 7	A194 7	A194 8	A194 8M	A194 8	A194 8M
Back seat	A182 F6a	A182 F316	A182 F6a	A182 F6a	A182 F304	A182 F316	A182 F304L	A182 F316L
Gland ring	A276 410	A276 316	A276 410	A276 410	A276 304	A276 316	A276 304L	A276 316L

Not: 1. All material in accordance with ASTM standards
2. Additional material available upon request



CLASS 150

Bore		L	L1	L2	H	W	H1	W1	T	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	N.m	kg/lb
2	50	203/8	216/8.5	203/8	350/13.8	220/8.7			35	21/46
2-1/2	65	216/8.5	229/9	216/8.5	362/14.3	250/9.8			68	29/63
3	80	241/9.5	254/10	241/9.5	384/15.1	280/11			80	34/75
4	100	292/11.5	305/12	292/11.5	450/17.7	320/12.6			130	54/119
5	125	356/14	369/14.5	356/14	475/18.7	320/12.6			180	72/158
6	150	406/16	419/16.5	406/16	537/21.1	400/15.8			220	93/205
8	200	495/19.5	508/20	495/19.5	707/27.8	450/17.7	760/29.9	310/12.2	490	185/407
10	250	622/24.5	635/25	622/24.5	788/31	560/22.1	988/38.9	460/18.1	920	268/590
12	300	698/27.5	711/28	698/27.5	875/34.5	560/22.1	1047/41.2	460/18.1	1250	400/881
14	350	787/31	800/31.5	787/31			1400/55.1	600/23.6	1865	650/1433
16	400	914/36	927/36.5	914/36			1698/66.9	600/23.6	2960	1113/2453

* Additional sizes available upon request.

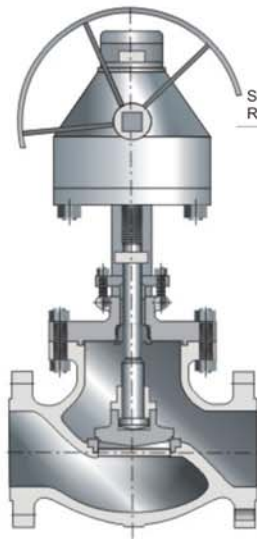
CLASS 300

Bore		L	L1	L2	H	W	H1	W1	T	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	N.m	kg/lb
2	50	267/10.5	283/11.1	267/10.5	350/13.8	220/8.7			72	28/61
2-1/2	65	292/11.5	308/12.1	292/11.5	377/14.8	250/9.8			115	36/79
3	80	318/12.5	334/13.1	318/12.5	410/16.1	280/11			168	50/110
4	100	356/14	371/14.6	356/14	470/18.5	320/12.6			300	75/165
5	125	400/15.8	416/16.4	400/15.8	620/24.4	400/15.8			400	140/308
6	150	444/17.5	460/18.1	444/17.5	708/27.9	450/17.7	789/31.1	460/18.1	785	200/440
8	200	559/22	575/22.6	559/22	777/30.6	500/19.7	862/33.9	460/18.1	1490	287/632
10	250	622/24.5	638/25.1	622/24.5	935/36.8	560/22.1	997/39.3	460/18.1	2560	510/1124
12	300	711/28	727/28.6	711/28	1058/41.7	600/23.6	1320/52	600/23.6	3510	720/1587

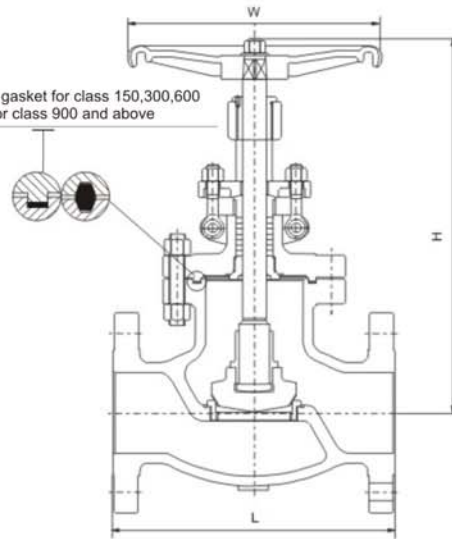
CLASS 600

Bore		L	L1	L2	H	W	H1	W1	T	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	N.m	kg/lb
2	50	292/11.5	295/11.6	292/11.5	408/16.1	280/11	1027/40.4	520/20.5	200	32/70
2-1/2	65	330/13	333/13.1	330/13	498/19.6	320/12.6	1086/42.8	460/18.1	360	45/99
3	80	356/14	359/14.1	356/14	568/22.4	350/13.8	1380/54.3	600/23.6	440	62/136
4	100	432/17	435/17.1	432/17	681/26.8	450/17.7	1663/65.5	600/23.6	600	139/306
6	150	559/22	562/22.1	559/22	901/35.5	560/22.1			1760	342/754
8	200	660/26	663/26.1	660/26	913/35.9	600/23.6			3875	483/1064
10	250	787/31	790/31.1	787/31	1160/45.7	700/27.6			5395	870/1918
12	300	838/33	841/33.1	838/33	1227/48.3	760/29.9			9170	1067/2352

* Additional sizes available upon request.



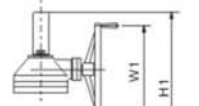
Spiral wound gasket for class 150,300,600
RTJ gasket for class 900 and above



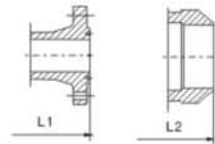
Impact handwheel operation



Gear operated



To flow pass centerline of body



CLASS 900

Bore		L	L1	L2	H	W	H1	W1	T	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	N.m	kg/lb
2	50	368/14.5	371/14.6	368/14.5	535/21.1	350/13.8			285	58/127
2-1/2	65	419/16.5	422/16.6	419/16.5	630/24.8	400/15.8			420	92/202
3	80	381/15	384/15.1	381/15	675/26.6	350/13.8			530	144/317
4	100	457/18	460/18.1	457/18	780/30.7	500/19.7			1065	225/496
6	150	610/24	613/24.1	610/24	936/36.9	600/23.6	1003/39.5	460/18.1	1795	502/1106
8	200	737/29	740/29.1	737/29	1051/41.4	700/27.6	1257/49.5	600/23.6	3440	720/1587

CLASS1500

Bore		L	L1	L2	H	W	H1	W1	T	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	mm/in	N.m	kg/lb
2	50	368/14.5	371/14.6	368/14.5	535/21.1	350/13.8			350	66/145
2-1/2	65	419/16.5	422/16.6	419/16.5	630/24.8	400/15.8			700	115/253
3	80	470/18.5	473/18.6	470/18.5	712/28	450/17.7			930	188/414
4	100	546/21.5	549/21.6	546/21.5	810/31.9	560/22.1			1820	292/643
6	150	705/27.8	711/28	705/27.8			1208/47.6	600/23.6	3870	620/1366
8	200	832/32.8	842/33.1	832/32.8			1655/65.2	600/23.6	5020	808/1781

CLASS 2500

Bore		L	L1	L2	H1	W1	T	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	mm/in	N.m	kg/lb
2	50	451/17.8	454/17.9	451/17.8	800/31.5	460/18.1	500	190/418
3	80	578/22.8	584/23	578/22.8	925/36.4	530/20.9	960	390/859
4	100	673/26.5	683/26.9	673/26.5	1110/43.7	530/20.9	2100	730/1609
6	150	914/36	927/36.5	914/36				
8	200	1022/40.3	1038/40.9	1022/40.3				

* Additional sizes available upon request.



CHECK VALVE



STANDARD FOR DESIGN AND MANUFACTURE

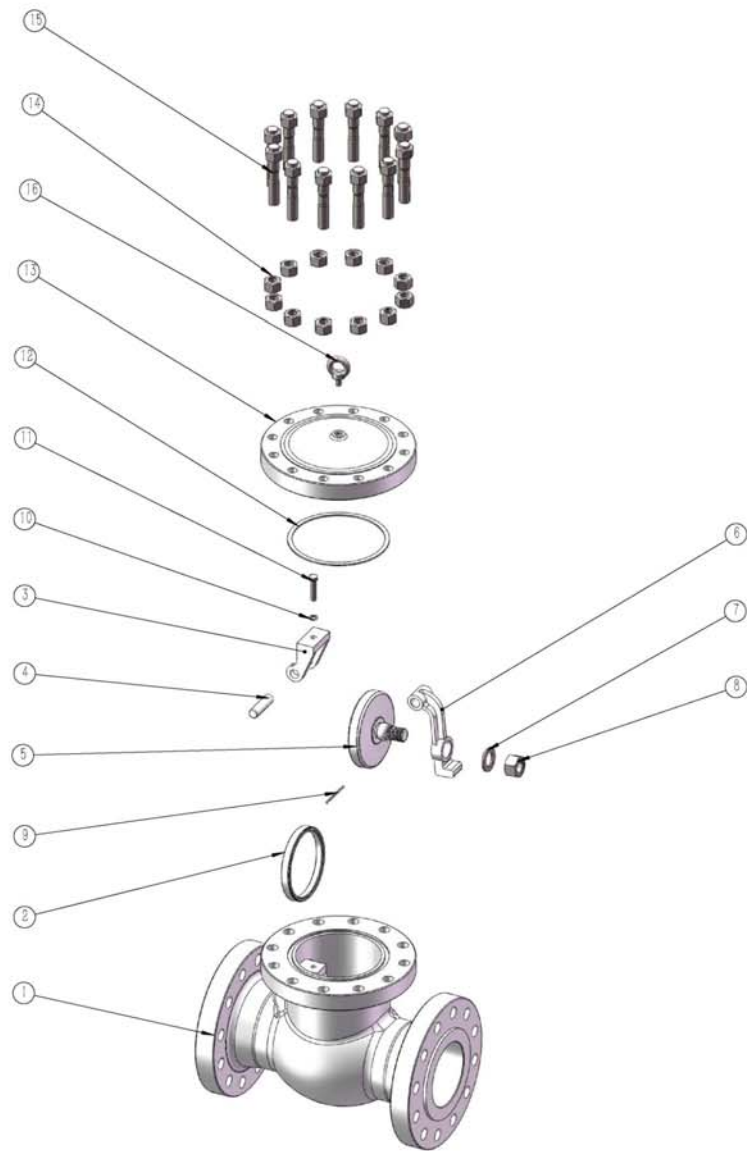
Designed and Manufactured in accordance with: API 594, ASME B16.34

Face to Face in accordance with: ASME B16.10

Connection Dimension in accordance with: ASME B16.5, ASME B16.25, ASME B16.47

Inspection and Test in accordance with: ISO 5208, API 598

① Body	⑥ Hinge	⑪ Bolt	⑯ Lifting Lug
② Seat	⑦ Washer	⑫ Cover Gasket	
③ Disc Hanger Yoke	⑧ Disc Nut	⑬ Cover	
④ Shaft	⑨ Cotter Pin	⑭ Cover Nut	
⑤ Disc	⑩ Washer	⑮ Cover Stud	



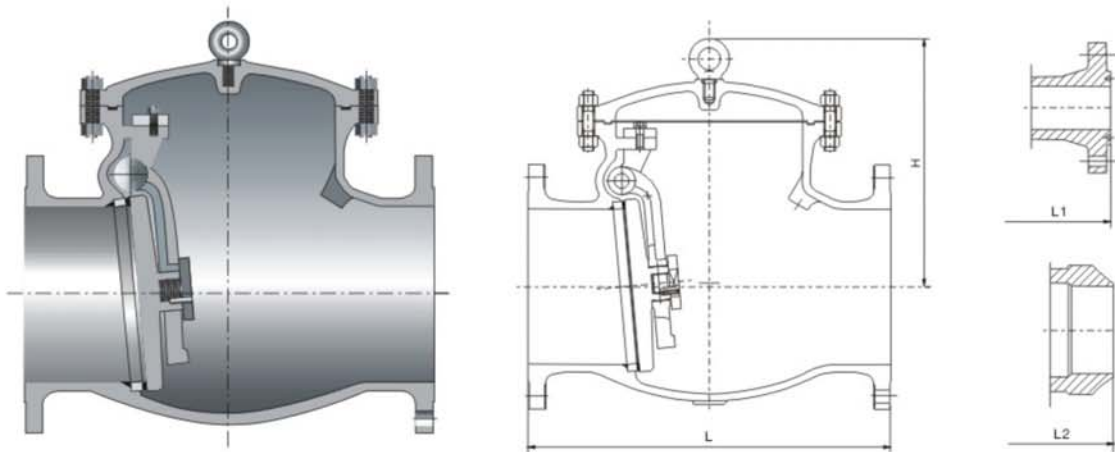
API pressure test(Mpa/PSI)

Class	Shell test	High pressure seal test	Low pressure seal test
150	2.9/428	2.2/314	
300	7.7/1110	5.6/814	
600	15.3/2220	11.2/1628	
900	23/3330	16.7/2442	0.6/87
1500	38.3/5558	28.1/4076	
2500	63.8/9255	46.8/6787	

Common Materials

PART NAME	CARBON STEEL		ALLOY STEEL		STAINLESS STEEL			
Body	A216 WCB	A352 LCC	A217 WC6	A217 WC9	A351 CF8	A351 CF8M	A351 CF3	A351 CF3M
Cove	A216 WCB	A352 LCC	A217 WC6	A217 WC9	A351 CF8	A351 CF8M	A351 CF3	A351 CF3M
Disc	A105N+13Cr	A350 LF2+316	A182 F11+STL	A182 F22+STL	A182 F304	A182 F316	A182 F304L	A182 F316L
Seat	A105N+STL	A350 LF2+STL	A182 F11+STL	A182 F22+STL	A182 F304+STL	A182 F316+STL	A182 F304L+STL	A182 F316L+STL
Hinge pin	A182 F6a	A182 F316	A182 F6a	A182 F6a	A182 F304	A182 F316	A182 F304L	A182 F316L
Stud	A193 B7	A320 L7M	A193 B16	A193 B16	A193 B8	A193 B8M	A193 B8	A193 B8M
Nut	A194 2H	A194 7M	A194 7	A194 7	A194 8	A194 8M	A194 8	A194 8M

Not: 1. All material in accordance with ASTM standards
2. Additional material available upon request



CLASS 150

Bore		L	L1	L2	H	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	kg/lb
2	50	203/8	216/8.5	203/8	182/7.2	17/37
2-1/2	65	216/8.5	229/9	216/8.5	186/7.3	20/44
3	80	241/9.5	254/10	241/9.5	227/8.9	25/55
4	100	292/11.5	305/12	292/11.5	260/10.2	40/88
5	125	330/13	343/13.5	330/13	277/10.9	67/147
6	150	356/14	368/14.5	356/14	304/12	93/205
8	200	495/19.5	508/20	495/19.5	374/14.7	134/295
10	250	622/24.5	635/25	622/24.5	417/16.4	199/438
12	300	698/27.5	711/28	698/27.5	478/18.8	305/672
14	350	787/31	800/31.5	787/31	540/21.3	370/815
16	400	864/34	877/34.5	864/34	620/24.4	542/1194
18	450	978/38.5	991/39	978/38.5	690/27.2	750/1653
20	500	978/38.5	991/39	978/38.5	720/28.4	900/1984
24	600	1295/51	1308/51.5	1295/51	871/34.3	1200/2645
30	750	1524/60		1524/60	1005/39.6	2190/4828

* Additional sizes available upon request.



CLASS 300

Bore		L	L1	L2	H	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	kg/lb
2	50	267/10.5	283/11.1	267/10.5	200/7.9	23/50
2-1/2	65	292/11.5	308/12.1	292/11.5	225/8.9	37/81
3	80	318/12.5	334/13.1	318/12.5	250/9.8	46/101
4	100	356/14	372/14.6	356/14	281/11.1	71/156
5	125	400/15.8	416/16.4	400/15.8	305/12	100/220
6	150	444/17.5	460/18.1	444/17.5	323/12.7	118/260
8	200	533/21	549/21.6	533/21	374/14.7	134/295
10	250	622/24.5	638/25.1	622/24.5	440/17.3	296/652
12	300	711/28	727/28.6	711/28	462/18.2	458/1009
14	350	838/33	854/33.6	838/33	571/22.5	583/1285
16	400	864/34	880/34.6	864/34	659/25.9	754/1662
18	450	978/38.5	994/39.1	978/38.5	676/26.6	935/2061
20	500	1016/40	1035/40.8	1016/40	742/29.2	1155/2546
24	600	1346/53	1368/53.9	1346/53	910/35.8	1408/3104

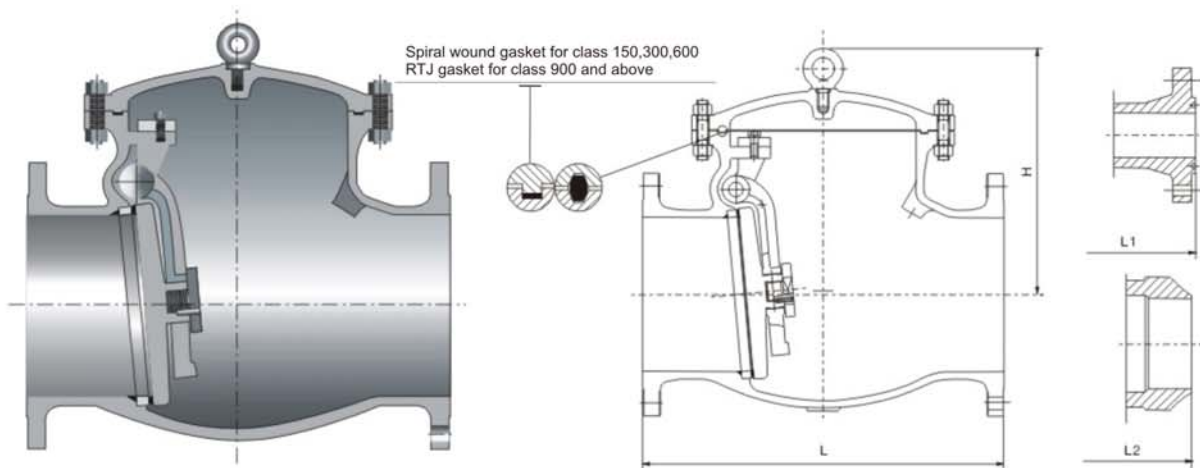
CLASS 600

Bore		L	L1	L2	H	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	kg/lb
2	50	292/11.5	295/11.6	292/11.5	200/7.9	26/57
2-1/2	65	330/13	333/13.1	330/13	227/8.9	32/70
3	80	356/14	359/14.1	356/14	250/9.9	49/108
4	100	432/17	435/17.1	432/17	300/11.8	86/189
5	125	508/20	511/20.1	508/20	340/13.4	165/363
6	150	559/22	562/22.1	559/22	363/14.3	185/407
8	200	660/26	663/26.1	660/26	446/17.6	365/804
10	250	787/31	790/31.1	787/31	500/16.7	557/1228
12	300	838/33	841/33.1	838/33	542/21.3	670/1477
14	350	889/35	892/35.1	889/35	670/26.4	944/2081
16	400	991/39	994/39.1	991/39	715/28.2	1300/2866
18	450	1092/43	1095/43.1	1092/43	786/30.9	1760/3880
20	500	1194/47	1200/47.3	1194/47	845/33.3	2200/4850
24	600	1397/55	1407/55.4	1397/55	1024/40.3	3350/7385

CLASS 900

Bore		L	L1	L2	H	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	kg/lb
2	50	368/14.5	371/14.6	368/14.5	200/8	58/127
2-1/2	65	419/16.5	422/16.6	419/16.5	260/10.2	76/167
3	80	381/15	384/15.1	381/15	285/11.2	100/220
4	100	457/18	460/18.1	457/18	340/13.4	140/308
6	150	610/24	613/24.1	610/24	445/17.5	294/648
8	200	737/29	740/29.1	737/29	545/21.5	700/1543
10	250	838/33	841/33.1	838/33	590/23.2	744/1640
12	300	965/38	968/38.1	965/38	676/26.6	870/1918
14	350	1029/40.5	1039/40.9	1029/40.5	740/29.1	1254/276
16	400	1130/44.5	1140/44.9	1130/44.5	800/31.5	1800/3968

* Additional sizes available upon request.



CLASS 1500						
Bore		L	L1	L2	H	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	kg/lb
2	50	368/14.5	371/14.6	368/14.5	200/8	66/145
2-1/2	65	419/16.5	422/16.6	419/16.5	255/10.1	84/185
3	80	470/18.5	473/18.6	470/18.5	285/11.2	123/271
4	100	546/21.5	549/21.6	546/21.5	325/12.8	192/423
6	150	705/27.8	711/28	705/27.8	470/18.5	481/1060
8	200	832/32.8	842/33.1	832/32.8	561/22.1	824/1816
10	250	991/39	1001/39.4	991/39	675/26.6	1252/2760
12	300	1130/44.5	1146/45.1	1130/44.5	840/33.1	1440/3174
14	350	1257/49.5	1276/50.6	1257/49.5	950/37.4	1745/3847
16	400	1384/54.5	1406/55.4	1384/54.5	1107/43.6	2500/5511

CLASS 2500						
Bore		L	L1	L2	H	WT(RF)
inch	mm	mm/in	mm/in	mm/in	mm/in	kg/lb
2	50	451/17.8	454/17.9	451/17.8	300/11.8	98/216
3	80	578/22.8	584/23	578/22.8	380/15	190/418
4	100	673/26.5	683/26.9	673/26.5	440/17.3	392/864
6	150	914/36	927/36.5	914/36	540/21.3	880/1940
8	200	1022/40.3	1038/40.9	1022/40.3	775/30.5	2450/5401
10	250	1270/50	1292/50.9	1270/50		
12	300	1422/56	1444/56.9	1422/56		

* Additional sizes available upon request.

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