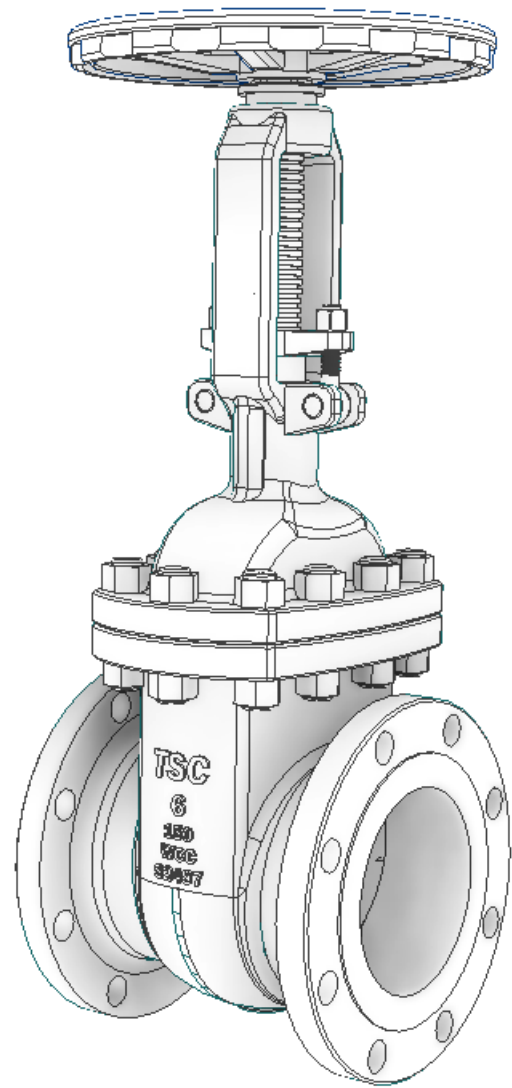


TSC

API 6D MIDSTREAM PRODUCTS

BALL /GATE/GLOBE/CHECK VALVES

APPLICABLE CODES & STANDARDS
(ASME, API,BA,JIS,DIN)



Thank you

Qingdao

TAESUNG (TSC) VALVE CO.,LTD.

#50-602, Tianan Digital City, Chengyang District, Qingdao City,
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TEL.: 86+532-5555-0702~3

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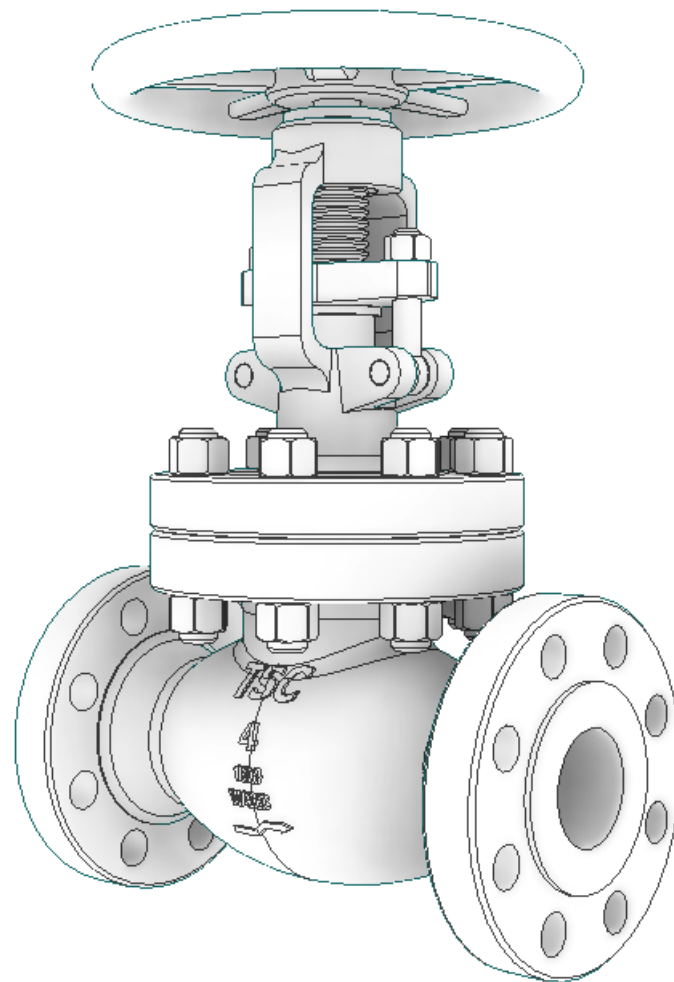
Home P.: www.teamsparkle.com

태성밸브

꿈과 열정으로 고객감동을 실현하는 기업이 되겠습니다.

TSC VALVE WITH DREAMS AND PASSIONS

Brief of History
Principal Partner Supply List
Figure Number system
Gate Valve
Globe valve
Swing Check Valve
Forged steel Small Valve
Ball Valve
Technical Data



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PREFACE

The competition in every field of society has become every more fierce day by day, and the worldwide competition is also an international stream of the business.

No exception to this principal can be made for “TSC”, which has shared in the development of the industrial society in the basis of noteworthy Technical know-how, However, “TSC” hereby declares further dynamic advancement of valve engineering and manufacturing through the reinforcement of its power of competition through ceaseless technical development, innovation and collaboration with the advanced technical professionals all over the world.

We called it “the globalization of valve business”.

“TSC VALVE CO.,LTD.” founded in 2005 as a specialized company of trade the API 600, ASME B16.34 API 6D steel gate ,globe, check & ball valve in Company, has attained a high reputation to the customers by supplying high quality products in both domestic and overseas markets.

Also our present success has been attributed to our business philosophy supported by the efficient management and facilities combined with the common truth that our prosperity in business also makes for our customer’s advantage and benefits.

We ,TSC, would be your reliable business partners to share our mutual benefits with your constant collaborations supplying with the highest quality engineered valves. We also do our utmost endeavors so that we could be the indispensable enterprise and the unique valve engineering company in the development of China & Korean industry.

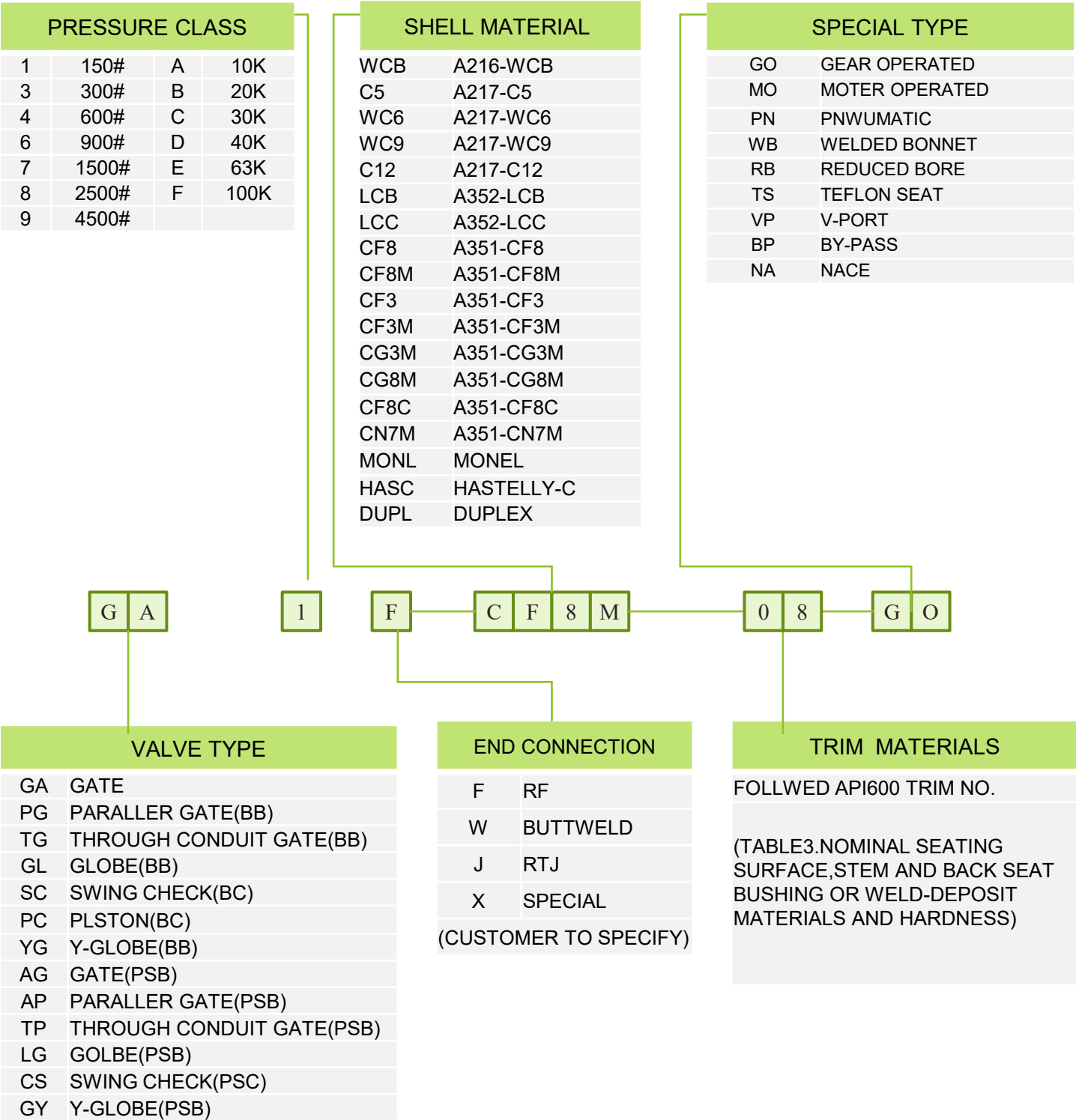
Thanks & best regards
President B.H.Shin

Byungho-Shin

Principal Partner Supply List

2024	Registered as a business partner to SAMKUN century Co.,Ltd	KOREA
	Registered as a business partner to WEIGU Valve Co.,Ltd	CHINA
	Registered as a business partner to XDY STEEL Co.,Ltd	CHINA
2023	Taylor SAMSUNG Semiconductor USA : Project No.: T-1	USA
	Pyeongtaek SAMSUNG Electronics Co.,Ltd. : Project No.: Phase3	KOREA
	Registered as a business partner to BAOTI TITANIUM Co.,Ltd	CHINA
2022	Registered as a business partner to YILANG STEEL Co.,Ltd	CHINA
2020	Registered as a business partner to INHA Co.,Ltd	KOREA
2019	Registered as a business partner to DWC Co.,Ltd	KOREA
	Registered as a business partner to VMV Co.,Ltd	CHINA
	Registered as a business partner to BTL Co.,Ltd	CHINA
	FUSHUNG ADVANCED MATERIALS (NANTONG) Co.,Ltd. : Project No. NS-161	CHINA
2018	Registered as a business partner to CHANGYUAN Co.,Ltd	CHINA
	Registered as a business partner to CRXV Co.,Ltd	CHINA
	Registered as a business partner to FUJI Co.,Ltd	CHINA
	FUSHUNG CHEMICAL (NANTONG) Co.,Ltd. :Project No. TC-100	CHINA
2017	HANOI SAMSUNG DISPLAY MODUL Co.,Ltd	VIETNAM
2015	Registered as a business partner to TEJI Valve Co.,Ltd	CHINA
	INDONESIA MADURA CHEMICAL Co.,Ltd : Project No. Husky Madura FPSO	INDONESIA
2014	Registered as a business partner to PT.ALPHACON Valve Co.,Ltd	INDONESIA
	Registered as a business partner to KCV Valve Co.,Ltd	JAPAN
	Registered as a business partner to SSV Valve Co.,Ltd	KOREA
2012	Registered as a business partner to HENG TONG Valve Co.,Ltd	CHINA
	Registered as a business partner to STARD-MINLI Valve Co.,Ltd	CHINA
	Registered as a business partner to OVIKO Valve Co.,Ltd	CHINA
2011	Registered as a business partner to ICL Valve Co.,Ltd	KOREA
2010	Registered as a business partner to SUNKOREA Co.,Ltd	KOREA
	Registered as a business partner to S&W Valve Co.,Ltd	KOREA
	Registered as a business partner to SHINSUNG Valve Co.,Ltd	KOREA
	Registered as a business partner to WINJOIN Co.,Ltd	CHINA
2009	Registered as a business partner to HWASUNG Valve Co.,Ltd	KOREA
2007	Registered as a business partner to HWAYI Valve Co.,Ltd	CHINA
	Registered as a business partner to DUNAN Group	CHINA
	Registered as a business partner to HONGSHIN Valve Co.,Ltd	KOREA
	TAESUNG Valve Project Promotion	KOREA
2006	Registered as a business partner to POSCO	KOREA
2005	The Company was established of ' Qingdao TAESUNG International Trading Co.,Ltd'	CHINA

Figure Number



TSC VALVE WITH DREAMS AND PASSIONS
꿈과 열정으로 고객감동을 실현하는 기업이 되겠습니다.



Bolted Bonnet Gate Valve
API-600
API-6D
ASME B16.34

Bolted Bonnet Gate Valve

NPS 2"-36" (DN50-900), ASME CLASSES : 150-2500



TSC VALVE manufactures superior cast body, bolted bonnet OS&Y gate valves in a variety of materials, trims, packing types, sizes (2" thru 36") and pressure classes (150 thru 2500). The mechanical characteristics make the **TSC** wedge gate valve are ideal for bi-directional "total flow system open/shut off" applications with minimal turbulence and pressure drop.

DESIGN & MANUFACTURING STANDARDS

Basic Design : API600 / API 6D / ASME B16.34
Face to Face Dimension : ASME B16.10
Flange End Dimension : ASME B16.5 / MSS SP-44 (26" above)
Butt-Weld End Dimension ASME B16.25
Inspection & Testing : API 6D

DESIGN DESCRIPTION:

FULL PORT DESIGN
BB, BOLTED BONNET
CHOICE OF SOLID OR SPLIT WEDGE
FORGED T-HEAD STEM
FLANGED OR BUTT WELDING ENDS
OS & Y, OUTSIDE SCREW AND YOKE
FLEXIBLE WEDGE, FULLY GUIDED
RENEWABLE SEAT RINGS
RISING STEM AND NON-RISING HANDWHEEL
AVAILABLE WITH GEAR OPERATOR

ASTM Main Parts and Materials

NO	Part Name	Material		
1	Body	A216-WCB	A217-WC6	A351-CF8
2	Bonnet	A216-WCB	A217-WC6	A351-CF8
3	Wedge	A217-ca15+STL	A217-CA15+STL	A351-CF8+STL
4	Stem	A479-410	A479-410	A479-304
5	Body Seat Ring	A-576-1020+STL	A182-F11-STL	A240-304+STL
6	Back Seat Ring	A479-410	A479-410	A479-304
7	Gasket	Spiral Wound & Graphite+304+304		
8	Packing	Graphte+Graphite with inconel wire		
9	Hinge Bolt	A307-B	A307-B	A193-B8
10	Hinge Nut	A194-2H	A194-2H	A194-B
11	Hinge Pin	A576-1020	A576-1020	A479-304
12	Packing Gland	A576-1020+Cr	A479-410	A479-304
13	Bonnet Bolt	A193-B7	A193-B16	A193-B8
14	Bonnet Nut	A194-2H	A194-4	A194-8
15	Yoke Cap	A576-1020	A576-1020	A576-1020+Zn
16	Yoke Sleeve	A439-D2C	A439-D2C	A439-D2C
17	Gland Flang	A105	A105	A351-CF8
18	Handle Wheel	A197	A197	A197
19	Handle Nut	A47-32510+Zn	A47-32510+Zn	A47-32510+Zn
20	Nipple	STEEL+Cr	STEEL+Cr	STEEL+Cr
21	Gear Box	A395 (DUCTILE IRON)		
22	Stem Cover	A53		

NOTE: 1) Other materials available
2) Hard faced 3) Hardened.
4) For eye bolts Gr.B, for studs B7 is used.

TSC

Bolted Bonnet Gate Valve Function

Gate valve is characterized by a sliding wedge which is moved by actuator perpendicular to the flow direction. There are a variety of valve sizes and types. The valve is used primarily as a stop valve to open or close fully. Normally it works for slurries, viscous fluid, but not for throttling. The gate valve usually has a minimum pressure drop in full open and a tight seal in full close, and therefore there is little possibility that contaminants may enter the valve.

BODY AND BONNET

The body and bonnet is designed to achieve most uniform distribution of stress on all sides and minimum turbulence and resistance to flow. The bonnet on valve is equipped with back seat ring up to 12" for Class 150 & 300 and up to 10" for Class 600 or higher. The yoke is integrated with bonnet.

BODY-BONNET JOINT

Body-bonnet joint of gate valve is machined as follows:
1>Class 150 : Plain faced
2>Class 300 and higher class : Male and female
We can supply any kinds of gasket as required by customer.

WEDGE

The valve is normally supplied with a one-piece flexible wedge of which the cross section is a tapered H shape. All wedges are fully The flexible wedge is cast or machined with circumferential grooves to allow the seating faces to move independently and adjust the movement of body seat. It is used where the line load or thermal expansion of system may distort the seating face of valve, and especially useful to prevent sticking that may happen in case the valve is closed at a hot temperature and opened at a cold temperature. Ideally the wedge is suitable for steam and other high temperature service.

STEM

The stem connection to the wedge shall have an integrated tee head (without welding)and is rectified in the packing area to ensure a long life and connections between stem and wedge not to disengage the stem from wedge while gate valve is working. The strength of stem and wedge connections is stronger than that of stem alone at the root of thread.

PACKING

The packing size is designed to secure maximum tightness along the stem, and the standard packing is a non-asbestos type. We can supply any kinds of packing as required by customer.

TSC

YOKE SLEEVE

The yoke sleeve is designed to able to be disassembled without discounting bonnet and stem, and provided with ball bearing of 14" or over for Class 150~300 valve, 6"or over for Class 600, and 2" or over for Class 900~1500.

GLAND

The gland is made of two prices. Packing gland is in contact with the packing which is connected to gland flange through a spherical particular design permits a correct pressure on the packing without any damage to stem due to friction or corrosion.

STUFFING BOX

The stuffing box gives maximum packing stem seal Lantern ring and grease injector shall be furnished only if specified on the purchase order.

HAND WHEELS

Hand wheels are designed for easy operation. With gearing, motor actuator or cylinder actuator, it is also available for more difficult services.

BOLTS AND NUTS

Bolts and nuts are made from four different types of steel materials in conformity with the ASTM specification:

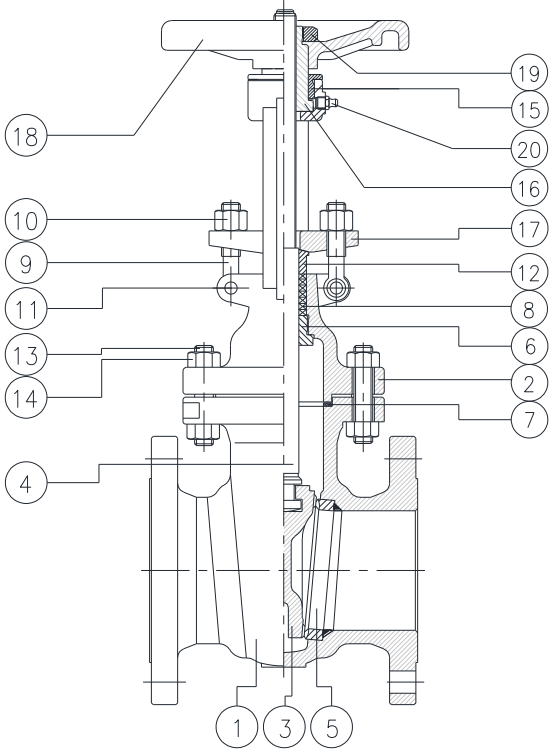
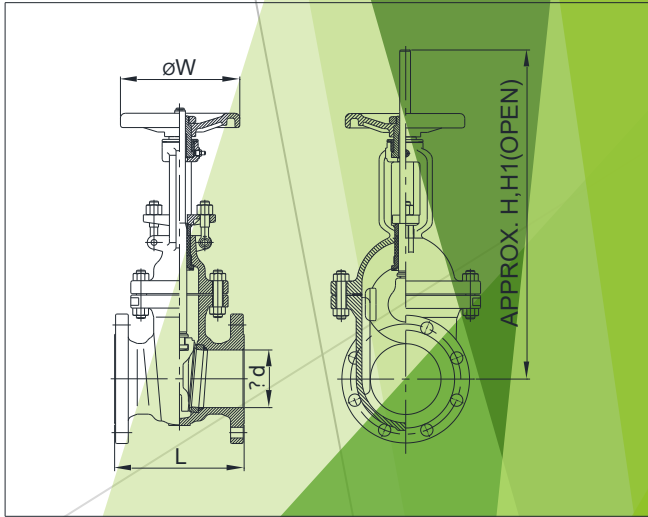


Figure 1- Nomenclature



*BW : Butt weld / FLG : Flanged
*H : Center-to-top, open / H1 : Dismantling height

END CONNECTIONS

In our standard production of valve, the flange ends(RF.FF) and the face to face dimensions conform to ANSI B16.5 and ASME B16.10, respectively, and they have a raised face serrated finish type or other finish type as requested. For butt welded ends (B.W.), of which the end to end dimension conforms to ASME B16.10, customer must specify the schedule type required, pipe class, or bore diameter. Ring type joint flanged ends (R.T.J) conform to ASME B16.5 and the end to end dimension follows ASME B16.10. The other special end connections may be supplied as required by customer.

GEAR OPERATED VALVE

Valve can be supplied with gear operators.

MOTOR OPERATED VALVE

Valve can be supplied with actuators, either electric or pneumatic, according to customer's requirements.

ACCESSORIES

We can supply a valve fitted with accessories such as bypass, locking device, chain wheel, extension stem, etc. For more details, refer to the Accessories column.

PACKING AND GASKET MATERIALS

Packing material supplied in standard valve is non-asbestos graphite, with braided graphite rings and die-formed rings configured to provide reliable and long-lasting performance. Braided rings are coated with zinc dust to inhibit corrosion.

Deformed rings are 98% carbon(minimum) and have maximum 50PPM chloride 550PPM sulfur content.

For standard valve, gasket materials are as follows;

- 1.Class 150 - graphite sheet type with 304 stainless steel fanged (1.6mm minimum overall thickness)
- 2.Class 300 - spiral wound 304 stainless steel and graphite.
- 3.Class 600 - same as class 300 or 900
- 4.Class 900 and 1500 - Ring type joint

SEAL AREA DESIGN

Cast steel valve are designed and manufactured to satisfy strict requirements in order to prevent external leakage and to meet fugitive emission requirements of most customers.

Stuffing box finishes of 63 to 125 RMS, stem finishes of 16 to 32 RMS, control of straightness and concentricity of stems, and controlled diametrical clearances between stem and gland, stem and backseat, and gland and stuffing box, all combine to guarantee consistent performance of stem seals.

Gasket surfaces between bodies and bonnets are strictly controlled to finishes of 32 to 63 AARH. When combined with engineered bolting design, I quality materials and strict assembly procedures, these finishes guarantee consistent sealing in gasket areas.



Gate Valve Dimensions

SIZE	ASME CLASS 150						ASME CLASS 300					ASME CLASS 600					ASME CLASS 900				
NPS DN	L		H	H1 (OPEN)	Ød	ØW	L	H	H1 (OPEN)	Ød	ØW	L	H	H1 (OPEN)	Ød	ØW	L	H	H1 (OPEN)	Ød	ØW
	BW	FLG																			
2	8.50	7.00	15.63	20.38	2.00	8	8.50	15.63	20.38	2.00	8	11.50	15.66	20.38	2.00	8	14.50	21.25	29.00	1.88	10
2 ½	9.50	7.50	16.88	22.14	2.50	8	9.50	16.94	22.20	2.50	8	13.00	18.59	22.20	2.50	8	16.50	23.50	31.50	2.38	12
65	241	191	429	562	64	203	241	430	564	64	203	330	472	564	64	203	-	-	-	-	-
3	11.13	8.00	18.56	24.26	3.00	10	11.13	20.22	26.38	3.00	10	14.00	21.63	26.38	3.00	10	15.00	25.75	34.50	2.88	14
80	282	203	471	616	76	254	282	514	670	76	254	356	549	670	76	254	381	654	876	73	356
4	12.00	9.00	22.25	28.32	4.00	10	12.00	23.90	30.95	4.00	10	17.00	25.75	30.95	4.00	10	18.00	28.75	37.50	3.88	18
100	305	229	565	719	102	254	305	607	786	102	254	432	654	786	102	254	457	730	953	99	457
6	15.88	10.50	31.19	38.00	6.00	14	15.88	32.31	40.38	6.00	14	22.00	36.28	40.38	6.00	14	24.00	39.00	49.00	5.75	20
150	403	267	792	965	152	356	403	821	1026	152	356	559	922	1026	152	356	610	991	1245	146	508
8	16.50	11.50	38.19	46.13	8.00	18	16.50	40.94	50.16	8.00	18	26.00	43.72	50.16	8.00	18	29.00	51.75	62.75	7.50	(2)
200	419	292	792	1172	203	457	419	1040	1274	203	457	660	1110	1274	203	457	737	1315	1594	191	(2)
10	18.00	13.00	47.16	56.28	10.00	20	18.00	49.19	59.87	10.00	20	31.00	49.06	59.87	10.00	20	33.00	57.75	67.25	9.38	(2)
250	457	330	1198	1430	254	508	457	1249	1521	254	508	787	1246	1521	254	508	838	1467	1708	238	(2)
12	19.75	14.00	55.91	66.75	12.00	20	19.75	59.00	70.61	12.00	24	33.00	61.13	70.61	12.00	24	38.00	66.57	83.00	11.13	(2)
300	502	356	1420	1695	305	508	502	1499	1763	305	610	838	1553	1763	305	610	965	1691	2108	283	(2)
14	22.50	15.00	61.50	75.50	13.25	24	30.00	61.38	77.75	13.25	24	35.00	72.50	77.75	13.25	24	40.50	73.88	90.00	12.25	(2)
350	572	381	1562	1918	337	610	762	1559	1975	337	610	889	1842	1975	337	610	1029	1877	2286	311	(2)
16	24.00	16.00	68.75	85.00	15.25	24	33.00	68.75	85.50	15.25	30	39.00	82.25	85.50	15.25	30	44.50	80.44	100.00	14.00	(2)
400	610	406	1746	2159	387	610	838	1746	2172	387	762	991	2089	2172	387	762	1130	2043	2540	356	(2)
18	26.00	17.00	73.25	90.00	17.25	24	36.00	77.88	94.00	17.00	(2)	43.00	87.06	94.00	17.00	(2)	-	-	-	-	-
450	660	432	1861	2286	438	610	914	1978	2388	432	(2)	1092	2211	2388	432	(2)	-	-	-	-	-
20	28.00	18.00	83.00	100.00	19.25	30	39.00	86.50	100.00	19.00	(2)	47.00	103.00	100.00	19.00	(2)	-	-	-	-	-
500	711	457	2108	2540	489	762	991	2197	2540	483	(2)	1194	2616	2540	483	(2)	-	-	-	-	-
24	32.00	20.00	97.00	115.00	23.25	30	45.00	101.25	125.00	23.00	(2)	55.00	115.00	125.00	23.00	(2)	-	-	-	-	-
600	813	508	2464	2921	591	762	1143	2572	3175	584	(2)	1397	2921	3175	584	(2)	-	-	-	-	-
26	34.00	22.00	114.50	125.00	25.00	(2)	49.00	114.50	125.00	25.00	(2)	-	-	-	-	-	-	-	-	-	-
650	864	559	2908	3175	635	(2)	1245	2908	3175	635	(2)	-	-	-	-	-	-	-	-	-	-
28	36.00	24.00	118.63	130.00	27.00	(2)	53.00	118.63	130.00	27.00	(2)	-	-	-	-	-	-	-	-	-	-
700	914	610	3013	3302	686	(2)	1346	3013	3302	686	(2)	-	-	-	-	-	-	-	-	-	-
30	36.00	24.00	124.13	140.00	29.25	(2)	55.00	124.13	145.00	29.25	(2)	-	-	-	-	-	-	-	-	-	-
750	914	610	3153	3556	743	(2)	1397	3153	3683	743	(2)	-	-	-	-	-	-	-	-	-	-
32	38.00	26.00	129.63	150.00	30.75	(2)	60.00	129.63	150.00	30.75	(2)	-	-	-	-	-	-	-	-	-	-
800	965	660	3293	3810	781	(2)	1524	3293	3810	781	(2)	-	-	-	-	-	-	-	-	-	-
34	40.00	28.00	143.00	163.00	32.75	(2)	64.00	147.63	168.00	32.75	(2)	-	-	-	-	-	-	-	-	-	-
850	1016	711	3632	4140	832	(2)	1626	3750	4267	832	(2)	-	-	-	-	-	-	-	-	-	-
36	40.00	28.00	146.68	170.00	35.25	(2)	68.00	147.81	185.00	35.25	(2)	-	-	-	-	-	-	-	-	-	-
900	1016	711	3726	4318	895	(2)	1727	3754	4699	895	(2)	-	-	-	-	-	-	-	-	-	-

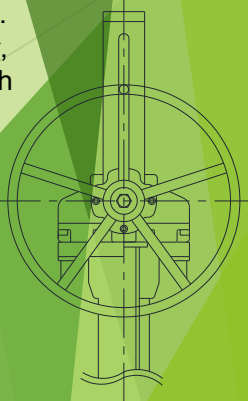
SIZE	ASME CLASS 1500					ASME CLASS 2500			
	NPS	L	H	H1	Ød	L	H	Ød	ØW
2	50	14.50	21.25	29.00	1.88	10	17.80	24.40	11.80
3	80	18.50	25.75	34.50	2.75	14	22.80	31.90	17.70
4	100	21.50	28.75	37.50	3.63	18	26.50	42.30	24.80
6	150	27.75	39.00	49.00	5.38	(2)	36.00	57.10	24.80
8	200	32.75	45.25	60.00	7.00	(2)	40.20	63.00	28.00
10	250	39.00	57.75	71.00	8.75	(2)	50.00	82.50	31.50
12	300	44.50	73.56	92.00	10.38	(2)	56.00	90.20	35.40

(1)Height does not include actuator. (2) Gear actuator
(3)Butt weld and flanged valves have the same end-to-end dimensions for class 300 and up.

Gear actuators

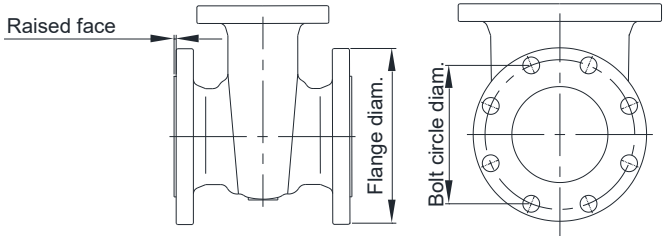
Gearing is generally applied to valves to make operation easier. The gearing may be, of the spur, bevel, or worm type-any of which may be applied TSC valves.

The gears and gear brackets May be either cast iron or cast Steel and may have cast or cut teeth, depending on the loads and the application. Gearing is too often neglected when valve operation is considered, resulting in unsatisfactory operation that requires expensive changes.



Flanged, Weights, Cv Flow Coefficients

API 600 CAST STEEL VALVES
CLASS 150 ~ 1500
DRILLED AND FACED AS FOLLOWS
ASME B 16.5 & ASME B 16.47
(Note: Dimensions are in inches and weights in pounds)



Gate Valve Dimensions

ASME CLASS	DIMENSIONS INCHES							WEIGHT IN LBS.		Cv FLOW COEFFICIENTS		
	SIZE		FLANGE DIAM.	BOLT CIRCLE DIAM.	HOLE DIAM.	QTY. HOLES	DIAM. BILTS	GATE		GATE	GLOBE	CHECK
	NPS	DN						BW	FL			
150 1/16 RAISED FACE	2	50	6.00	4.75	0.75	4	5/8	42	48	260	35	95
	2 1/2	65	7.00	5.50	0.75	4	5/8	50	59	420	60	150
	3	80	7.50	6.00	0.75	4	5/8	67	78	625	92	220
	4	100	9.00	7.50	0.75	8	5/8	97	117	1150	180	410
	6	150	11.00	9.50	0.88	8	3/4	180	198	2650	430	950
	8	200	13.50	11.75	0.88	8	3/4	278	319	4850	810	1750
	10	250	16.00	14.25	1.00	12	7/8	456	515	7750	1070	2800
	12	300	19.00	17.00	1.00	12	7/8	646	738	11500	1950	4100
	14	350	21.00	18.75	1.13	12	1	875	954	14000	2500	6200
	16	400	23.50	21.25	1.13	16	1	1120	1200	19000	3400	8400
	18	450	25.00	22.75	1.25	16	1 1/8	1485	1570	24000	4500	11000
	20	500	27.50	25.00	1.25	20	1 1/8	1825	1910	31000	-	13500
	24	600	32.00	29.50	1.38	20	1 1/4	2870	2960	45000	6720	20000
	26	650	34.25	31.75	1.38	24	1 1/4	3600	3700	53000	-	23500
	28	700	36.50	34.00	1.38	28	1 1/4	4400	4500	62000	-	28000
	30	750	38.75	36.00	1.38	28	1 1/4	4705	4750	73000	-	33000
	32	800	41.75	38.50	1.63	28	1 1/2	5800	6000	81000	-	38245
	34	850	43.75	40.50	1.63	32	1 1/2	-	6000	92500	-	-
	36	900	46.00	42.75	1.63	32	1 1/2	6500	6850	108000	-	48000

ASME CLASS	DIMENSIONS INCHES							WEIGHT IN LBS.		Cv FLOW COEFFICIENTS		
	SIZE		FLANGE DIAM.	BOLT CIRCLE DIAM.	HOLE DIAM.	QTY. HOLES	DIAM. BILTS	GATE		GATE	GLOBE	CHECK
	NPS	DN						BW	FL			
300 1/16 RAISED FACE	2	50	6.50	5.00	0.75	8	5/8	46	60	260	35	95
	2 1/2	65	7.50	5.88	0.88	8	3/4	55	76	420	60	150
	3	80	8.25	6.62	0.88	8	3/4	90	115	625	92	220
	4	100	10.00	7.88	0.88	8	3/4	136	166	1150	180	410
	6	150	12.50	10.63	0.88	12	3/4	245	314	2650	370	950
	8	200	15.00	13.00	1.00	12	3/4	415	506	4850	695	1750
	10	250	17.50	15.25	1.13	16	1	646	762	7750	1065	2800
	12	300	20.50	17.75	1.25	16	1 1/8	900	1100	11500	1640	4100
	14	350	23.00	20.25	1.25	20	1 1/8	1392	1720	14000	2015	6200
	16	400	25.50	22.50	1.38	20	1 1/4	1870	2220	19000	2705	8400
	18	450	28.00	24.75	1.38	24	1 1/4	2405	2960	23500	4500	11000
	20	500	30.50	27.00	1.38	24	1 1/4	3260	3700	30000	-	13500
	24	600	36.00	32.00	1.63	24	1 1/2	4250	5100	44000	6580	20000
	26	650	38.25	34.50	1.75	28	1 5/8	5000	5500	53000	-	-
	28	700	40.75	37.00	1.75	28	1 5/8	7000	7500	62000	-	28000
	30	750	43.00	39.25	1.88	28	1 3/4	8550	9000	73000	-	-
	32	800	45.25	41.50	2.00	28	1 7/8	8200	8800	81000	-	-
	34	850	-	-	-	-	-	-	-	-	-	41330
	36	900	50.00	46.00	2.13	32	2	13500	15500	108000	-	-

(1)NPS 26 (DN 650) and up : ASME B16.47 Series A (MSS-SP-44). For Series B (API 605) contact the factory.

Gate Valve Dimensions

ASME CLASS	DIMENSIONS INCHES							WEIGHT IN LBS.		Cv FLOW COEFFICIENTS		
	SIZE		FLANGE DIAM.	BOLT CIRCLE DIAM.	HOLE DIAM.	QTY. HOLES	DIAM. BILTS	GATE		GATE	GLOBE	CHECK
	NPS	DN						BW	FL			
600 1/4 RAISED FACE	2	50	6.50	5.00	0.75	8	5/8	60	72	260	35	95
	2 1/2	65	7.50	5.88	0.88	8	3/4	89	102	420	60	150
	3	80	8.25	6.63	0.88	8	3/4	130	157	625	92	220
	4	100	10.75	8.50	1.00	8	7/8	224	275	1150	155	410
	6	150	14.00	11.50	1.13	12	1	394	540	2650	369	950
	8	200	16.50	13.75	1.25	12	1 1/8	726	884	4850	695	1750
	10	250	20.00	17.00	1.38	16	1 1/8	1125	1405	7750	1050	2800
	12	300	22.00	19.25	1.38	20	1 1/4	1490	1812	11500	1345	4100
	14	350	23.75	20.75	1.50	20	1 3/8	2200	2500	13000	-	5900
	16	400	27.00	23.75	1.63	20	1 1/2	3000	3700	18000	-	7800
	18	450	29.25	25.75	1.75	20	1 5/8	4000	4800	22000	-	9900
	20	500	32.00	28.50	1.75	24	1 5/8	5600	6800	27000	-	12000
	24	600	37.00	33.00	2.00	24	1 7/8	8000	9800	40000	-	18000

900 1/4 RAISED FACE	2	50	8.50	6.50	1.00	8	7/8	150	185	230	30	80
	2 1/2	65	9.63	7.50	1.13	8	1	-	-	-	-	200
	3	80	9.50	7.50	1.00	8	7/8	235	270	560	90	200
	4	100	11.50	9.25	1.25	8	1 1/8	270	355	1050	155	380
	6	150	15.00	12.50	1.25	12	1 1/8	830	980	2400	350	875
	8	200	18.50	15.50	1.50	12	1 3/8	1220	1500	4200	610	1325
	10	250	21.50	18.50	1.50	16	1 3/8	2000	2400	6750	975	2400
	12	300	24.00	21.00	1.50	20	1 3/8	3170	3670	9700	-	-
	14	350	25.25	22.00	1.62	20	1 1/2	3900	4460	12000	-	-
	16	400	27.75	24.25	1.75	20	1 5/8	5570	6250	16000	-	-

1500 1/4 RAISED FACE	2	50	8.50	6.50	1.00	8	7/8	150	185	230	30	80
	2 1/2	65	9.63	7.50	1.13	8	1	-	-	-	-	185
	3	80	10.50	8.00	1.25	8	1 1/8	255	325	510	75	185
	4	100	12.25	9.50	1.37	8	1 1/4	430	520	925	130	330
	6	150	15.50	12.50	1.50	12	1 3/8	1045	1205	2100	-	750
	8	200	19.00	15.50	1.75	12	1 5/8	1850	2550	3650	-	1325
	10	250	23.00	19.00	2.00	12	1 7/8	2600	3300	5850	-	2103

(1)NPS 26 (DN 650) and up : ASME B16.47 Series A (MSS-SP-44). For Series B (API 605) contact the factory.

TSC

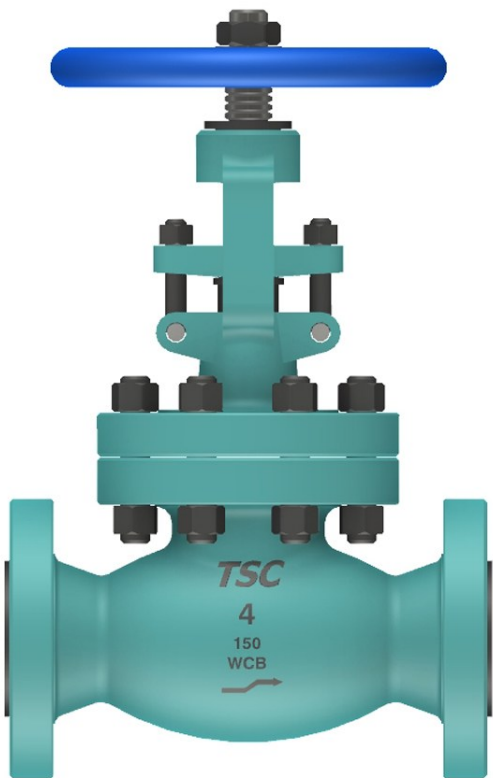
TSC VALVE WITH DREAMS AND PASSIONS
꿈과 열정으로 고객감동을 실현하는 기업이 되겠습니다.



Cast Steel Globe Valve
API-623
BS1873

Bolted Bonnet Globe Valve

NPS 2"-24" (DN50-600), ASME CLASSES : 150-1500



TSC VALVE manufactures superior cast body, bolted bonnet globe valves in a variety of materials, trims, packing types, sizes (2" thru 24") and pressure classes (150 thru 2500). The mechanical characteristics (moveable disc and stationary seat ring) make the **TSC** globe valve ideal for repeatable pipeline unidirectional throttling applications and frequent operation.

DESIGN & MANUFACTURING STANDARDS

Basic Design : API 623
Face to Face Dimension : ASME B16.10
Flange End Dimension : ASME B16.5
Butt-Weld End Dimension ASME B16.25
Inspection & Testing : API 598

DESIGN DESCRIPTION:

- STRAIGHT PATTERN BODY DESIGN
- OS & Y, OUTSIDE SCREW AND YOKE
- BB, BOLTED BONNET
- YOKE INTEGRAL WITH BONNET
- RISING STEM AND HANDWHEEL
- LOOSE DISC, CHOICE OF PLUG OR BALL
- RENEWABLE SEAT RING
- IMPACT HANDWHEEL FOR 10" & ABOVE
- FLANGED OR BUTT WELDING ENDS
- AVAILABLE WITH BG OPERATOR

ASTM Main Parts and Materials

NO	Part Name	Materials		
1	Body	A216-WCB	A217-WC6	A351-CF8M
2	Bonnet	A216-WCB	A217-WC6	A351-CF8M
3	Desc	A217-CA15+STL	A217-CA15+STL	A351-CF8+STL
4	Stem	A479-410	A479-410	A479-304
5	Handwheel	A395	A395	A395
6	Body Seat Ring	A216-WCB+STL	A217-WC6+STL	A351-CF8+STL
7	Back Seat Ring	A479-410	A479-410	A479-304
8	Gasket	SPIRAL WOULD / GRAHITE+304+304		
9	Packing	Graphte+Graphite with inconel wire		
10	Gland Flange	A283-D	A283-D	A351-CF8
11	Hinge Bolt	A307-B	A307-B	A193-B8
12	Hinge Nut	A194-2H	A194-2H	A194-8
13	Hinge Pin	A579-1020	A579-1020	A479-304
14	Packing Gland	A576-1020+Cr	A479-410	A479-304
15	Bonnet Bolt	A193-B7	A193-B16	A193-B8
16	Bonnet Nut	A194-2H	A194-4	A194-8
17	Yoke Bush	A439-D2C	A439-D2C	A439-D2C
18	Handle Nut	A563-A	A563-A	A194-8
19	Gear Box	A395	A395	A395

NOTE: 1) Ductile Ni-Resist optional
2) Disc and seat ring may either be solid facing material or a base material equal to or better than the body/bonnet material with facing as shown

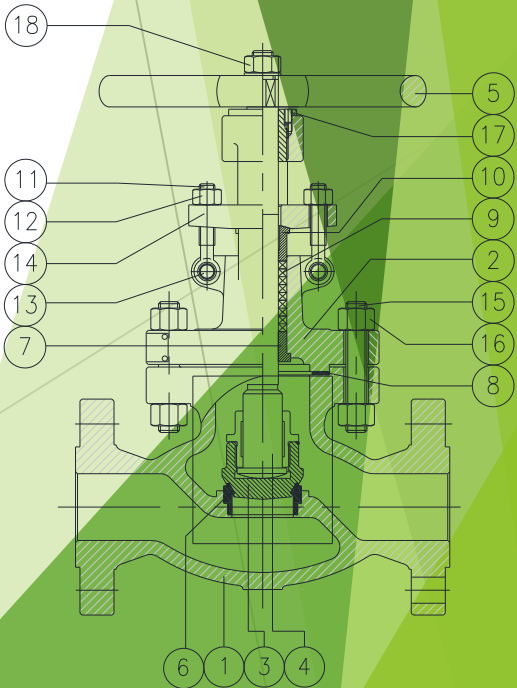


Figure 1- Nomenclature

Bolted Bonnet Globe Valve Function

The globe valve is used where throttling alone or both throttling and shutoff is needed. It may also be used for on-off service, but because of high pressure drop, such application is limited to the cases that the valve is normally closed and the pressure drop is of no importance in valve open condition. **TSC** cast steel globe valve is regularly made in outside screw and yoke design with full-way type disc.

BODY AND BONNET

The body has a spherical form with large radius, which permits the stress, turbulence and resistance to flow to be kept minimum. The bonnets on valve are equipped with back seat rings.

BODY & BONNET JOINT

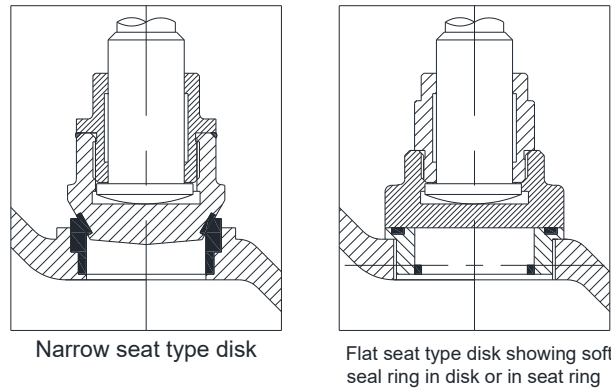
Body-bonnet joint of globe valve is machined as follows: All Male and female. We can supply any kinds of gasket as required by customer.

DISC

The valve is normally supplied with plug type disc.

SEAT RING

The valve is normally supplied with bottom seated type on 8" or larger valve, and the disc has bottom guide type seat rings.

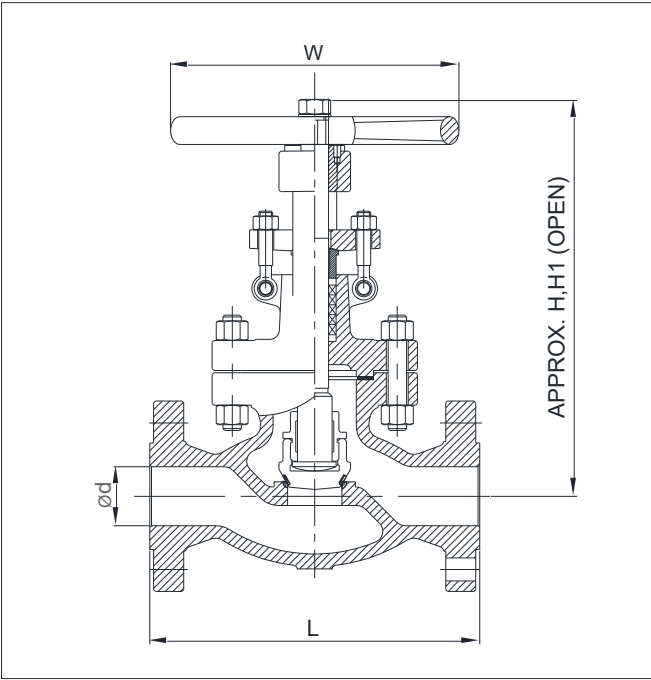


STEM

All stem have the turning and rising cut ACME threads.

PACKING

The packing size is designed to secure maximum tightness along the stem, and the standard packing is a non-asbestos type. We can supply any kinds of packing as required by customer.



*H : Center-to-top, open / H1 : Dismantling height

YOKE BUSH

The yoke nuts on globe valve are threaded and mounted to the bonnet, where it is secured with tack welding.

GLAND

The gland is made of two pieces. Packing gland is in contact with the packing which is connected to gland flange through a spherical joint. Particular design permits a correct pressure on the packing without any damage to stem due to friction or corrosion.

STUFFING BOX

The stuffing box gives maximum packing stem seal. Lantern ring and grease injector shall be furnished only if specified on the purchase order.

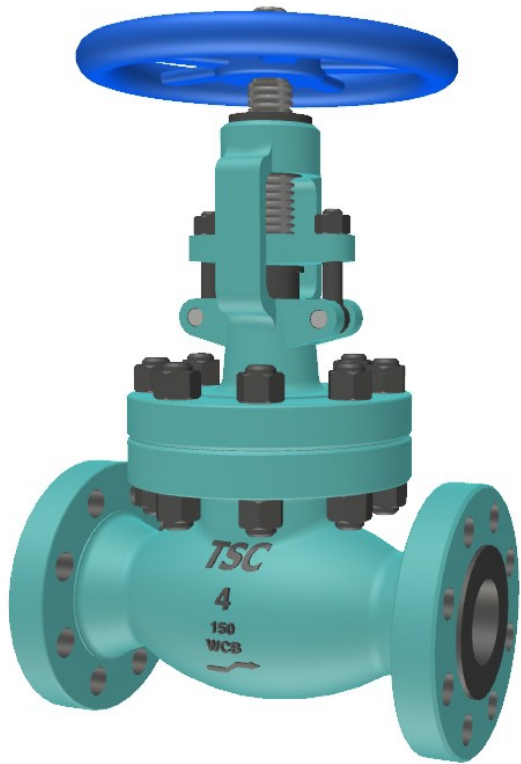
HAND WHEELS

Hand wheels are designed for easy operation. They are provided with hammer blow type of 8" and over for Class 150 valve, 6" and over for Class 300 and, 4" and over for Class 600, and 2.5" and over for Class 900 & 1500. With gearing, motor actuator or cylinder actuator, they are also available for more difficult services.

Globe Valve Dimensions

SIZE NPS DN	ASME CLASS 150					ASME CLASS 300					ASME CLASS 600					ASME CLASS 900					ASME CLASS 1500				
	L	H	H1 (OPEN)	Ød	ØW	L	H	H1 (OPEN)	Ød	ØW	L	H	H1 (OPEN)	Ød	ØW	L	H	H1 (OPEN)	Ød	ØW	L	H	H1 (OPEN)	Ød	ØW
2	8	16.85	20.88	2.00	8	10.5	16.85	20.88	2.00	8	11.50	17.10	21.13	2.00	10.00	14.50	19.75	25.00	1.9	18.00	14.50	19.75	25.00	1.9	18.00
50	203	428	530	51	203	267	428	530	51	203	292	434	537	51	254	368	502	635	48	457	368	502	635	48	457
2 1/2	8.50	17.10	21.25	2.50	10	11.50	17.10	21.25	2.50	10.00	13.00	18.67	22.88	2.50	10.00	-	-	-	-	-	-	-	-	-	-
65	216	434	540	64	254	292	434	540	64	254	330	474	581	64	254	-	-	-	-	-	-	-	-	-	-
3	9.50	18.42	22.75	3.00	10	12.50	18.42	22.75	3.00	10.00	14.00	20.19	24.13	3.00	14.00	15.00	24.09	30.50	2.85	14	18.50	24.09	30.50	2.75	14
80	241	468	578	76	254	318	468	578	76	254	356	513	613	76	356	381	612	775	73	356	470	612	775	70	356
4	11.50	20.88	26.18	4.00	14	14.00	20.88	26.18	4.00	14.00	17.00	23.88	29.25	4.00	24.00	18.00	27.50	35.38	3.85	18	21.50	27.42	35.38	3.62	-
100	292	530	665	102	356	356	530	665	102	356	432	607	743	102	610	457	699	899	98	457	546	696	899	92	-
6	16	25.75	32	6.00	24	17.50	26.38	32.88	6.00	24	22.00	31.22	37.88	6.00	24.00	24.00	39.13	45.03	5.75	(4)	-	-	-	-	-
150	406	654	813	152	610	445	670	835	152	610	559	793	962	152	610	610	939	1143	146	(4)	-	-	-	-	-
8	19.50	30.73	38.38	8.00	24	22.00	32.00	38.88	8.00	24	26.00	41.75	57.88	7.87	(4)	29.00	50.13	62.63	7.48	(4)	-	-	-	-	-
200	495	780	975	203	610	559	813	988	203	610	660	1030	1470	200	(4)	737	1273	1590	190	(4)	-	-	-	-	-
10	24.50	39.25	46.75	10	24	24.50	42.34	52.18	10.00	24	31.00	47.16	59.00	9.76	(4)	33.00	59.38	75.65	9.37	(4)	-	-	-	-	-
250	622	997	1187	254	610	622	1075	1325	254	610	787	1198	1499	248	(4)	838	1508	1922	238	(4)	-	-	-	-	-
12	27.50	42.52	53	12.00	24	28.00	46.19	62.75	12.00	(4)	33.00	57.53	72.16	11.73	(4)	-	-	-	-	-	-	-	-	-	-
300	699	1080	1346	305	610	711	1173	1594	305	(4)	838	1461	1833	298	(4)	-	-	-	-	-	-	-	-	-	-
14	31	54.21	65.44	13.25	(4)	33.00	54.21	72.00	13.25	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
350	787	1377	1662	337	(4)	838	1377	1829	337	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	36	59.94	72.63	15.25	(4)	34.00	59.94	76.00	15.25	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
400	914	1522	1845	387	(4)	863	1522	1930	387	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	38.50	59.62	75	17.25	(4)	38.50	59.62	75.00	17.00	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
450	978	1514	1905	438	(4)	978	1514	1905	432	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	51	85	119	21.25	(4)	55.00	85.00	119.00	19.00	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
600	1295	2159	3023	591	(4)	1397	2159	3023	483	(4)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

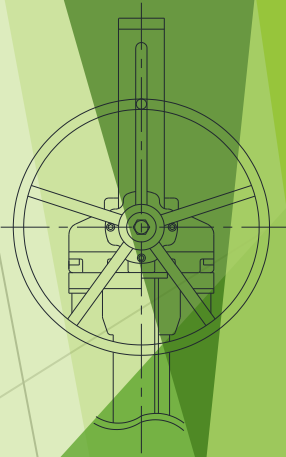
(1) Height does not include actuator. (2) Impactor handwheel
(3) Gear actuator is optional. (4) Gear actuator.



Gear actuators

Gearing is generally applied to valves to make operation easier. The gearing may be, of the spur, bevel, or worm type-any of which may be applied TSC valves.

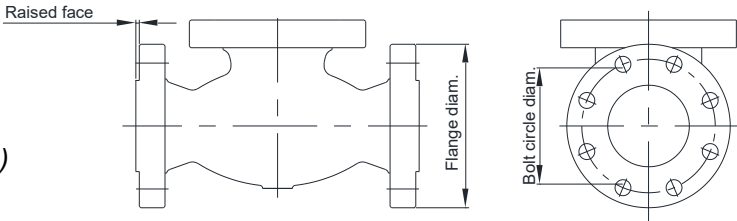
The gears and gear brackets may be either cast iron or cast steel and may have cast or cut teeth, depending on the loads and the application. Gearing is too often neglected when valve operation is considered, resulting in unsatisfactory operation that requires expensive changes.



TYPE	Size	Optional		Standard	
	ASME Class	NPS	DN	NPS	DN
GLOBE	150	6~12	150~300	14~16	350~400
	300	6~12	150~300	14~16	350~400
	600	4~10	100~250	-	-
	900	2~4	50~100	-	-
	1500	2~4	50~100	-	-

Flanged, Weights, Cv Flow Coefficients

API 623 CAST STEEL VALVES
CLASS 150 ~ 1500
DRILLED AND FACED AS FOLLOWS
ASME B 16.5 & ASME B 16.47
(Note: Dimensions are in inches and weights in pounds)



Globe Valve Dimensions

ASME CLASS	DIMENSIONS INCHES							WEIGHT IN LBS.		Cv FLOW COEFFICIENTS		
	SIZE		FLANGE DIAM.	BOLT CIRCLE DIAM.	HOLE DIAM.	QTY. HOLES	DIAM. BILTS	GLOBE		GATE	GLOBE	CHECK
	NPS	DN						BW	FL			
150 1/16 RAISED FACE	2	50	6.00	4.75	0.75	4	5/8	48	55	260	35	95
	2 1/2	65	7.00	5.50	0.75	4	5/8	54	58	420	60	150
	3	80	7.50	6.00	0.75	4	5/8	82	102	625	92	220
	4	100	9.00	7.50	0.75	8	5/8	120	152	1150	180	410
	6	150	11.00	9.50	0.88	8	3/4	240	280	2650	430	950
	8	200	13.50	11.75	0.88	8	3/4	405	435	4850	810	1750
	10	250	16.00	14.25	1.00	12	7/8	500	550	7750	1070	2800
	12	300	19.00	17.00	1.00	12	7/8	1050	1200	11500	1950	4100
	14	350	21.00	18.75	1.13	12	1	1700	1850	14000	2500	6200
	16	400	23.50	21.25	1.13	16	1	2300	2500	19000	3400	8400
	18	450	25.00	22.75	1.25	16	1 1/8	2640	2850	24000	4500	11000
	20	500	27.50	25.00	1.25	20	1 1/8	-	-	31000	-	13500
	24	600	32.00	29.50	1.38	20	1 1/4	7035	7403	45000	6720	20000
	26	650	34.25	31.75	1.38	24	1 1/4	-	-	53000	-	23500
	28	700	36.50	34.00	1.38	28	1 1/4	-	-	62000	-	28000
	30	750	38.75	36.00	1.38	28	1 1/4	-	-	73000	-	33000
	32	800	41.75	38.50	1.63	28	1 1/2	-	-	81000	-	38245
	34	850	43.75	40.50	1.63	32	1 1/2	-	-	92500	-	-
	36	900	46.00	42.75	1.63	32	1 1/2	-	-	108000	-	48000

ASME CLASS	DIMENSIONS INCHES							WEIGHT IN LBS.		Cv FLOW COEFFICIENTS		
	SIZE		FLANGE DIAM.	BOLT CIRCLE DIAM.	HOLE DIAM.	QTY. HOLES	DIAM. BILTS	GLOBE		GATE	GLOBE	CHECK
	NPS	DN						BW	FL			
300 1/16 RAISED FACE	2	50	6.50	5.00	0.75	8	5/8	45	60	260	35	95
	2 1/2	65	7.50	5.88	0.88	8	3/4	63	72	420	60	150
	3	80	8.25	6.62	0.88	8	3/4	88	114	625	92	220
	4	100	10.00	7.88	0.88	8	3/4	130	171	1150	180	410
	6	150	12.50	10.63	0.88	12	3/4	261	337	2650	370	950
	8	200	15.00	13.00	1.00	12	3/4	447	565	4850	695	1750
	10	250	17.50	15.25	1.13	16	1	1000	1150	7750	1065	2800
	12	300	20.50	17.75	1.25	16	1 1/8	1300	1550	11500	1640	4100
	14	350	23.00	20.25	1.25	20	1 1/8	1800	2100	14000	2015	6200
	16	400	25.50	22.50	1.38	20	1 1/4	2300	2700	19000	2705	8400
	18	450	28.00	24.75	1.38	24	1 1/4	2640	3200	23500	4500	11000
	20	500	30.50	27.00	1.38	24	1 1/4	-	-	30000	-	13500
	24	600	36.00	32.00	1.63	24	1 1/2	7109	7995	44000	6580	20000
	26	650	38.25	34.50	1.75	28	1 5/8	-	-	53000	-	-
	28	700	40.75	37.00	1.75	28	1 5/8	-	-	62000	-	28000
	30	750	43.00	39.25	1.88	28	1 3/4	-	-	73000	-	-
	32	800	45.25	41.50	2.00	28	1 7/8	-	-	81000	-	-
	34	850	-	-	-	-	-	-	-	-	-	41330
	36	900	50.00	46.00	2.13	32	2	-	-	108000	-	-

(1)NPS 26 (DN 650) and up : ASME B16.47 Series A (MSS-SP-44). For Series B (API 605) contact the factory.

Globe Valve Dimensions

ASME CLASS	DIMENSIONS INCHES							WEIGHT IN LBS.		Cv FLOW COEFFICIENTS		
	SIZE		FLANGE DIAM.	BOLT CIRCLE DIAM.	HOLE DIAM.	QTY. HOLES	DIAM. BILTS	GLOBE		GATE	GLOBE	CHECK
	NPS	DN						BW	FL			
600 1/4 RAISED FACE	2	50	6.50	5.00	0.75	8	5/8	60	72	260	35	95
	2 1/2	65	7.50	5.88	0.88	8	3/4	89	100	420	60	150
	3	80	8.25	6.63	0.88	8	3/4	130	150	625	92	220
	4	100	10.75	8.50	1.00	8	7/8	213	285	1150	155	410
	6	150	14.00	11.50	1.13	12	1	415	515	2650	369	950
	8	200	16.50	13.75	1.25	12	1 1/8	1050	1220	4850	695	1750
	10	250	20.00	17.00	1.38	16	1 1/8	1550	1830	7750	1050	2800
	12	300	22.00	19.25	1.38	20	1 1/4	-	-	11500	1345	4100
	14	350	23.75	20.75	1.50	20	1 3/8	-	-	13000	-	5900
	16	400	27.00	23.75	1.63	20	1 1/2	-	-	18000	-	7800
	18	450	29.25	25.75	1.75	20	1 5/8	-	-	22000	-	9900
	20	500	32.00	28.50	1.75	24	1 5/8	-	-	27000	-	12000
	24	600	37.00	33.00	2.00	24	1 7/8	-	-	40000	-	18000

900 1/4 RAISED FACE	2	50	8.50	6.50	1.00	8	7/8	68	150	230	30	80
	2 1/2	65	9.63	7.50	1.13	8	1	-	-	-	-	200
	3	80	9.50	7.50	1.00	8	7/8	165	225	560	90	200
	4	100	11.50	9.25	1.25	8	1 1/8	260	350	1050	155	380
	6	150	15.00	12.50	1.25	12	1 1/8	641	831	2400	350	875
	8	200	18.50	15.50	1.50	12	1 3/8	1278	1588	4200	610	1325
	10	250	21.50	18.50	1.50	16	1 3/8	-	-	6750	975	2400
	12	300	24.00	21.00	1.50	20	1 3/8	-	-	9700	-	-
	14	350	25.25	22.00	1.62	20	1 1/2	-	-	12000	-	-
	16	400	27.75	24.25	1.75	20	1 5/8	-	-	16000	-	-

1500 1/4 RAISED FACE	2	50	8.50	6.50	1.00	8	7/8	68	150	230	30	80
	2 1/2	65	9.63	7.50	1.13	8	1	-	-	-	-	185
	3	80	10.50	8.00	1.25	8	1 1/8	188	274	510	75	185
	4	100	12.25	9.50	1.37	8	1 1/4	-	-	925	130	330
	6	150	15.50	12.50	1.50	12	1 3/8	-	-	2100	-	750
	8	200	19.00	15.50	1.75	12	1 5/8	-	-	3650	-	1325
	10	250	23.00	19.00	2.00	12	1 7/8	-	-	5850	-	2103

(1)NPS 26 (DN 650) and up : ASME B16.47 Series A (MSS-SP-44). For Series B (API 605) contact the factory.

TSC

TSC VALVE WITH DREAMS AND PASSIONS
꿈과 열정으로 고객감동을 실현하는 기업이 되겠습니다.



Swing Check Valve
API-6D
BS 1868
ANSI B16.34

Full-opening Swing Check Valve

NPS 2"-36" (DN50-900), ASME CLASSES : 150-1500



TSC Valve manufactures a premium array of check valves. Our products are manufactured and tested in accordance with respective API, ASME, and ANSI standards. The **TSC** designs offers many features and options beneficial for oil, liquid gas, and liquid applications.

DESIGN & MANUFACTURING STANDARDS

Basic Design : API 6D / ASME B16.34
Face to Face Dimension : ASME B16.10
Flange End Dimension : ASME B16.5 / MSS-SP-44
Butt-Weld End Dimension ASME B16.25
Inspection & Testing : API 6D

DESIGN DESCRIPTION:

- BB, BOLTED BONNET CAP
- SWING TYPE, ANTI-ROTATION DISC
- RENEWABLE SEAT RING
- NON-PENETRATEISC SHAFT
- HORIZONTAL OR VERTICAL SERVICE
- FLANGED OR BUTTWELDING ENDS

ASTM Main Parts and Materials

NO	Part Name	Material
1	Body	A216-WCC
2	Bonnet	A105
3	Desc	A216-WCC
4	ARM	A216-WCC
5	Seat Ring	410+HF
6	Shaft	316SS
7	End Cap	A105
8	Bearing	Nitronic 60
9	End Bearing	Nitronic 60
10	Set Screw	18-8SS
11	Gasket	SS Graphite
12	O-Ring	Viton
13	Plug Gasket	SS Graphite
14	Stud	A193-B7M
15	Heavy Hex Nut	A194-2HM
16	Slotted Hex Nut	A194-2HM
17	Pin	304SS
18	Washer	304SS
19	NPT Plug	316SS
20	Eye Bolt	Carbon Steel

NOTE: 1) Cast sheet disc for NPS 4" and above. NPS 6" & larger, Disc and seat ring may either be solid facing material or a base material equal to or better then Body & Bonnet material with facing as shown.

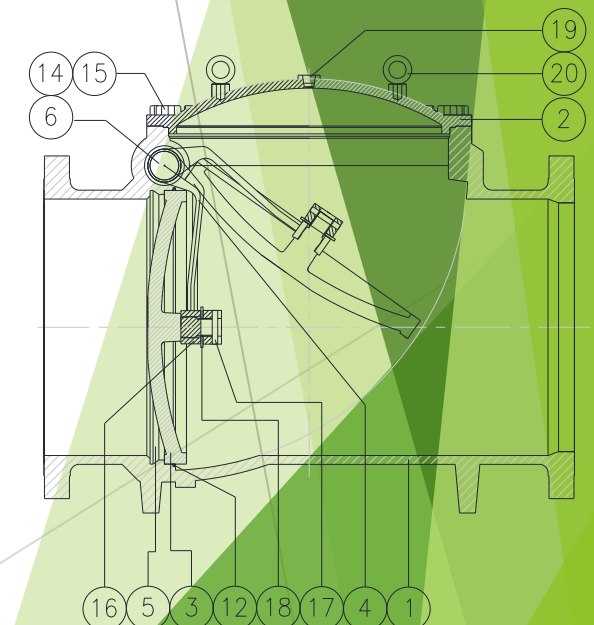


Figure 1- Full-opening Swing Check Valve

Full-opening Swing Check Valve Function

The swing check valve is designed so that it is opened automatically at the forward flow and closed at the reverse flow in horizontal or vertical (upward flow only through valve) piping runs. It has an advantage of low pressure drop and therefore is best suitable for velocity application.

BODY

Body-cover joint of swing check valve is machined as follows: 1)Class 150 : Male and female.
2)Class 300 and 600 : Male and female.
3)Class 900 higher class : Ring type joint.
We can supply any kinds of gasket as required by customer.

SEAT RING

The seat ring as a welded-in type is designed to prevent any turbulence and damage by corrosion. It is forged or rolled into one piece for all dimensions, heat treated to obtain the desired surface hardness, and cleaned thoroughly before assembling.



END CONNECTIONS

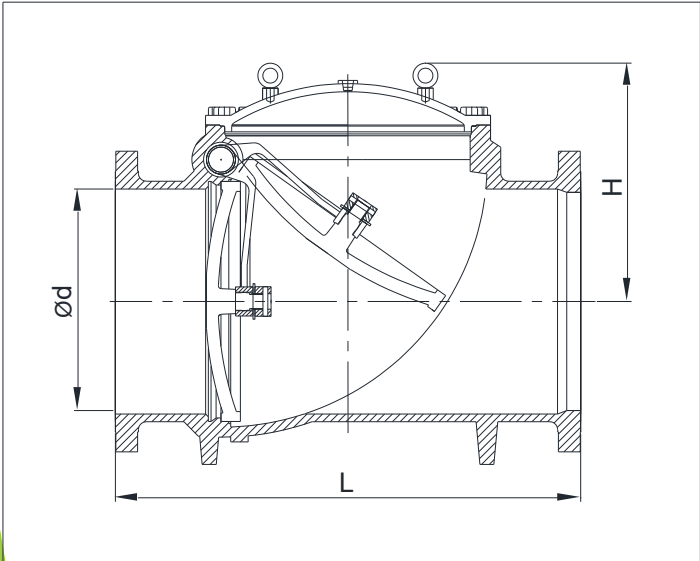
In our standard production of valve, the flange ends (RF) and the face to face dimensions conform to ANSI B16.5 and ASME B16.10, respectively, and they have a raised face serrated finish type or other finish type as requested. For butt-welded ends (B.W), Of which the end to end dimension conforms to ASME B16.10, customer must specify the schedule type required, pipe class, or bore diameter. Ring joint flanged ends (R.T.J) conform to ASME B16.5 and the end to end dimension follows ASME B16.10. The other special end connections may be supplied as required by customer.

HINGE ARRANGEMENT

- Body penetration is sealed with blind flange and spiral-wound gasket
- Arm pin is located near the disc center of gravity, minimizing sealing surface radius rotation and thus velocity.

ARM ARRANGEMENT

- Hydrofoil profile maintains the disc stability while being lifted by a hydrodynamic force at a flow including pulsating.
- Heavy-balanced weight insures that disc goes to seat immediately upon cessation of flow and minimizes water hammer.



*H : Center-to-top, open

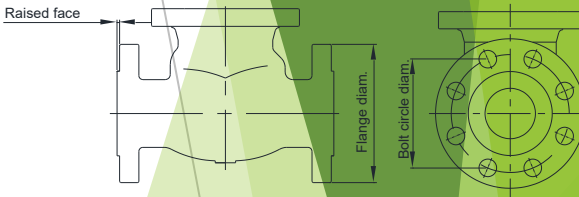
Swing Check Valve Dimensions

SIZE	ASME CLASS 150			ASME CLASS 300			ASME CLASS 600			ASME CLASS 900			ASME CLASS 1500			ASME CLASS 2500		
NPS DN	L	H	ød	L	H	ød	L	H	ød	L	H	ød	L	H	ød	L	H	ød
2 50	8 203	4.25 108	2.00 51	10.5 267	4.41 112	2.00 51	11.50 292	4.92 125	2.00 51	14.50 368	5.20 132		14.50 368	6.61 168	1.90 48	17.75 451	6.93 176	1.50 38
2 ½ 65	8.50 216	6.40 163	2.50 64	11.50 292	7.10 180	2.50 64	13.00 330	8.60 219	2.50 64	16.5 419	13.7 349		16.50 419	13.7 349	2.24 57	22.75 578	16.5 419	1.90 48
3 80	9.50 241	5.67 144	3.00 76	12.50 318	5.83 148	3.00 76	14.00 356	6.36 162	3.00 76	15.00 381	7.28 185	2.87 73	18.50 470	8.82 224	2.76 70	22.75 578	9.92 252	2.24 57
4 100	11.50 292	6.89 175	4.00 102	14.00 356	7.09 180	4.00 102	17.00 432	7.48 190	4.00 102	18.00 457	8.86 225	3.86 98	21.50 546	10.32 262	3.62 92	26.5 673	11.22 285	2.87 73
6 150	16 356	9.45 240	6.00 152	17.50 445	9.88 251	6.00 152	22.00 559	10.51 267	6.00 152	24.00 610	11.69 297	5.75 146	27.75 705	13.27 337	5.40 137	36.00 914	14.37 365	4.37 111
8 200	19.50 495	11.14 283	8.00 203	21.00 533	12.28 312	8.00 203	26.00 660	13.43 341	7.87 200	29.00 737	14.96 380	7.48 190	32.75 832	16.63 422.5	7.00 178	40.25 1022	17.83 453	5.75 146
10 250	24.50 622	14.37 365	10.00 254	24.50 622	14.76 375	10.00 254	31.00 787	15.87 403	9.76 248	33.00 838	17.4 442	9.37 238	39.00 991	19.69 500	8.74 222	42.13 1070	21.26 540	7.24 184
12 300	27.50 699	16.3 414	12.00 305	28.00 711	16.73 425	12.00 305	33.00 838	18.23 463	11.73 298	38.00 965	20.00 508	11.14 283	44.50 1130	20.98 553	10.40 264	56.00 1422	23.46 596	8.62 219
14 350	31 787	17.8 452	13.25 337	33.00 838	18.23 463	13.27 337	35.00 889	20.67 525	12.87 327	40.50 1029	23.66 601	12.24 311	-	-	-	-	-	-
16 400	36 914	19.37 492	15.24 387	34.00 863	19.88 505	15.24 387	39.00 991	22.24 565	14.76 375	44.50 1130	24.02 610	14.00 356	-	-	-	-	-	-
18 450	38.50 978	20.79 528	17.24 438	38.50 978	21.30 541	17.00 432	43.00 1092	24.69 678	16.5 419	-	-	-	-	-	-	-	-	-
20 500	38.50 978	22.74 575	19.25 489	40.0 1016	23.03 585	19.02 483	47.00 1194	31.34 796	18.26 464	-	-	-	-	-	-	-	-	-
24 600	51 1295	27.17 690	23.27 591	53.00 1346	27.52 699	23.00 584	55.00 1397	53.10 1349	22.00 559	-	-	-	-	-	-	-	-	-

Flanged, Weights, Cv Flow Coefficients

API 6D CAST STEEL VALVES
DRILLED AND FACED AS FOLLOWS
ASME B 16.5 & ASME B 16.47

(Note: Dimensions are in inches and weights in pounds)



ASME CLASS	DIMENSIONS INCHES							WEIGHT IN LBS.		Cv FLOW COEFFICIENTS		
	SIZE		FLANGE DIAM.	BOLT CIRCLE DIAM.	HOLE DIAM.	QTY. HOLES	DIAM. BILTS	CHECK		GATE	GLOBE	CHECK
	NPS	DN						BW	FL			
150 1/16 RAISED FACE	2	50	6.00	4.75	0.75	4	5/8	31	40	260	35	95
	2 1/2	65	7.00	5.50	0.75	4	5/8	35	44	420	60	150
	3	80	7.50	6.00	0.75	4	5/8	59	78	625	92	220
	4	100	9.00	7.50	0.75	8	5/8	98	121	1150	180	410
	6	150	11.00	9.50	0.88	8	3/4	179	212	2650	430	950
	8	200	13.50	11.75	0.88	8	3/4	314	360	4850	810	1750
	10	250	16.00	14.25	1.00	12	7/8	513	586	7750	1070	2800
	12	300	19.00	17.00	1.00	12	7/8	602	823	11500	1950	4100
	14	350	21.00	18.75	1.13	12	1	765	960	14000	2500	6200
	16	400	23.50	21.25	1.13	16	1	1120	1300	19000	3400	8400
	18	450	25.00	22.75	1.25	16	1 1/8	1450	1660	24000	4500	11000
	20	500	27.50	25.00	1.25	20	1 1/8	1700	2050	31000	-	13500
	24	600	32.00	29.50	1.38	20	1 1/4	2900	3300	45000	6720	20000
	26	650	34.25	31.75	1.38	24	1 1/4	-	-	53000	-	23500
	28	700	36.50	34.00	1.38	28	1 1/4	-	-	62000	-	28000
	30	750	38.75	36.00	1.38	28	1 1/4	-	-	73000	-	33000
	32	800	41.75	38.50	1.63	28	1 1/2	-	-	81000	-	38245
	34	850	43.75	40.50	1.63	32	1 1/2	-	-	92500	-	-
	36	900	46.00	42.75	1.63	32	1 1/2	-	-	108000	-	48000

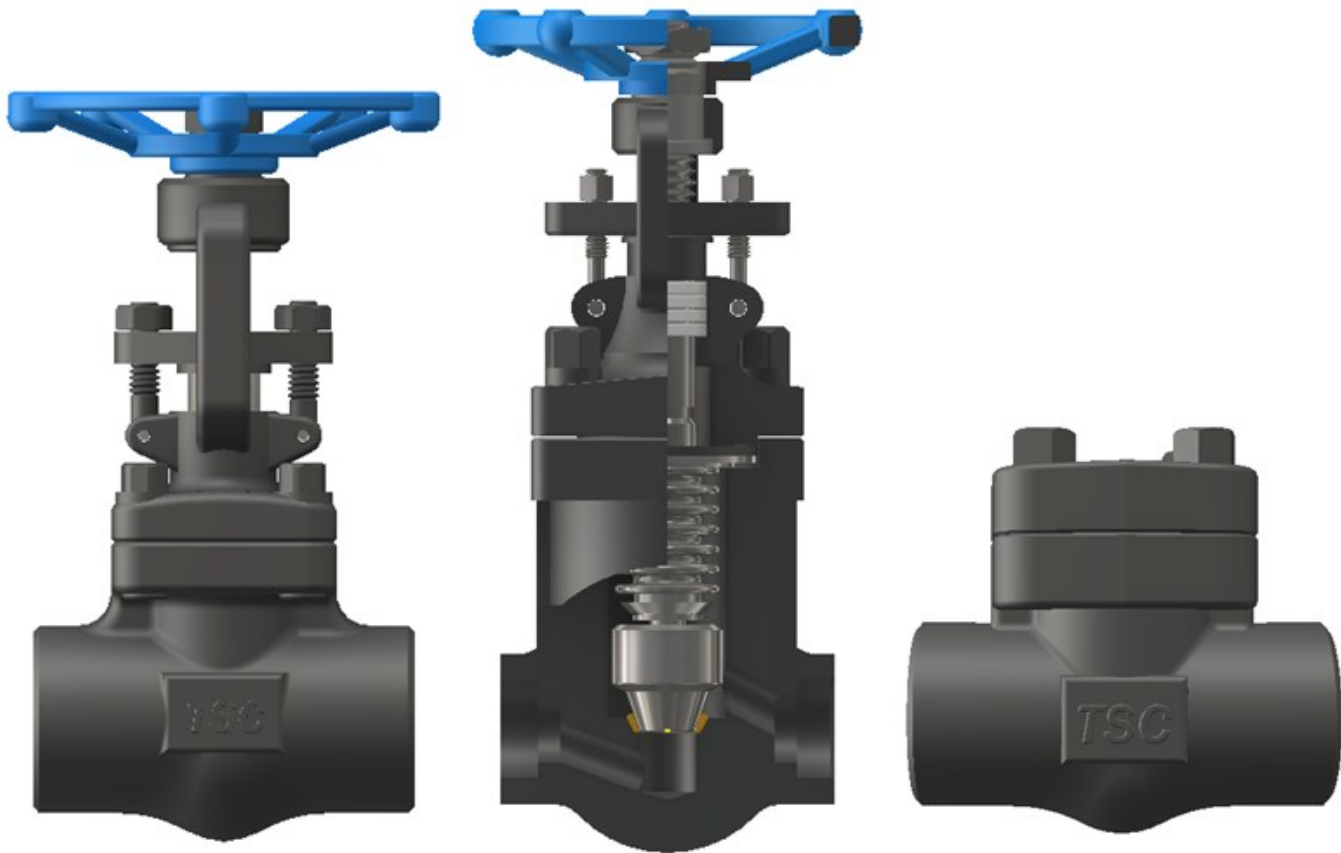
Swing Check Valve Dimensions

ASME CLASS	DIMENSIONS INCHES							WEIGHT IN LBS.		Cv FLOW COEFFICIENTS		
	SIZE		FLANGE DIAM.	BOLT CIRCLE DIAM.	HOLE DIAM.	QTY. HOLES	DIAM. BILTS	GLOBE		GATE	GLOBE	CHECK
	NPS	DN						BW	FL			
300 1/6 RAISED FACE	2	50	6.50	5.00	0.75	8	5/8	45	60	260	35	95
	2 1/2	65	7.50	5.88	0.88	8	3/4	63	72	420	60	150
	3	80	8.25	6.62	0.88	8	3/4	88	114	625	92	220
	4	100	10.00	7.88	0.88	8	3/4	130	171	1150	180	410
	6	150	12.50	10.63	0.88	12	3/4	261	337	2650	370	950
	8	200	15.00	13.00	1.00	12	3/4	447	565	4850	695	1750
	10	250	17.50	15.25	1.13	16	1	1000	1150	7750	1065	2800
	12	300	20.50	17.75	1.25	16	1 1/8	1300	1550	11500	1640	4100
	14	350	23.00	20.25	1.25	20	1 1/8	1800	2100	14000	2015	6200
	16	400	25.50	22.50	1.38	20	1 1/4	2300	2700	19000	2705	8400
	18	450	28.00	24.75	1.38	24	1 1/4	2640	3200	23500	4500	11000
	20	500	30.50	27.00	1.38	24	1 1/4	-	-	30000	-	13500
	24	600	36.00	32.00	1.63	24	1 1/2	7109	7995	44000	6580	20000
	26	650	38.25	34.50	1.75	28	1 5/8	-	-	53000	-	-
	28	700	40.75	37.00	1.75	28	1 5/8	-	-	62000	-	28000
	30	750	43.00	39.25	1.88	28	1 3/4	-	-	73000	-	-
	32	800	45.25	41.50	2.00	28	1 7/8	-	-	81000	-	-
	34	850	-	-	-	-	-	-	-	-	-	41330
	36	900	50.00	46.00	2.13	32	2	-	-	108000	-	-
600 1/4 RAISED FACE	2	50	6.50	5.00	0.75	8	5/8	60	72	260	35	95
	2 1/2	65	7.50	5.88	0.88	8	3/4	89	100	420	60	150
	3	80	8.25	6.63	0.88	8	3/4	130	150	625	92	220
	4	100	10.75	8.50	1.00	8	7/8	213	285	1150	155	410
	6	150	14.00	11.50	1.13	12	1	415	515	2650	369	950
	8	200	16.50	13.75	1.25	12	1 1/8	1050	1220	4850	695	1750
	10	250	20.00	17.00	1.38	16	1 1/8	1550	1830	7750	1050	2800
	12	300	22.00	19.25	1.38	20	1 1/4	-	-	11500	1345	4100
	14	350	23.75	20.75	1.50	20	1 3/8	-	-	13000	-	5900
	16	400	27.00	23.75	1.63	20	1 1/2	-	-	18000	-	7800
	18	450	29.25	25.75	1.75	20	1 5/8	-	-	22000	-	9900
	20	500	32.00	28.50	1.75	24	1 5/8	-	-	27000	-	12000
	24	600	37.00	33.00	2.00	24	1 7/8	-	-	40000	-	18000
900 1/4 RAISED FACE	2	50	8.50	6.50	1.00	8	7/8	68	150	230	30	80
	2 1/2	65	9.63	7.50	1.13	8	1	-	-	-	-	200
	3	80	9.50	7.50	1.00	8	7/8	165	225	560	90	200
	4	100	11.50	9.25	1.25	8	1 1/8	260	350	1050	155	380
	6	150	15.00	12.50	1.25	12	1 1/8	641	831	2400	350	875
	8	200	18.50	15.50	1.50	12	1 3/8	1278	1588	4200	610	1325
	10	250	21.50	18.50	1.50	16	1 3/8	-	-	6750	975	2400
	12	300	24.00	21.00	1.50	20	1 3/8	-	-	9700	-	-
	14	350	25.25	22.00	1.62	20	1 1/2	-	-	12000	-	-
	16	400	27.75	24.25	1.75	20	1 5/8	-	-	16000	-	-
1500 1/4 RAISED FACE	2	50	8.50	6.50	1.00	8	7/8	68	150	230	30	80
	2 1/2	65	9.63	7.50	1.13	8	1	-	-	-	-	185
	3	80	10.50	8.00	1.25	8	1 1/8	188	274	510	75	185
	4	100	12.25	9.50	1.37	8	1 1/4	-	-	925	130	330
	6	150	15.50	12.50	1.50	12	1 3/8	-	-	2100	-	750
	8	200	19.00	15.50	1.75	12	1 5/8	-	-	3650	-	1325
	10	250	23.00	19.00	2.00	12	1 7/8	-	-	5850	-	2103

(1)NPS 26 (DN 650) and up : ASME B16.47 Series A (MSS-SP-44). For Series B (API 605) contact the factory.

TSC

TSC VALVE WITH DREAMS AND PASSIONS
꿈과 열정으로 고객감동을 실현하는 기업이 되겠습니다.



Forged Steel Small Valve
API-602
BS 5352
ASME B16.34

Forged Steel Gate Valve

Outside Screw & York Bolted Bonnet SW-API 602
NPS 1/2"-2", ASME CLASSES : 150-2500Lb



TSC Valve provides forged steel API 602 gate valves in sizes 2" and smaller for natural gas and petroleum industries, as well as power plant services. Pressure designation: includes Class 150~2500Lb. Size range: 1/2"~ 2"

DESIGN & MANUFACTURING STANDARDS

Basic Design : API 6D / BS5352
Face to Face Dimension : ASME B16.11
Flange End Dimension : ASME B16.5
Butt-Weld End Dimension : ASME B16.25
Socket-Weld End : ASME B16.11
Inspection & Testing : API 598

Design Features

Bolted bonnet, welded bonnet, pressure sealed bonnet; fully guided one-piece solid wedge to reduce wear on seating surfaces; effective back seating design and packing mechanism to ensure a tight stem seal; outside screw and yoke(OS&Y) with rising stem; Tee-head stem design to prevent the stem from becoming disengaged from the wedge while the valve is in service. Half grooved/ recessed body-bonnet joint design to accommodate spiral wound stainless steel gasket for a tight body-bonnet sealing. Hard faced surfaces of both seating rings and the wedge to provide excellent wear resistance.

ASTM Main Parts and Materials

NO	Part Name	ASME Material		
1	Body	A105	A182-F316	A182-F11
2	Bonnet	A105	A182-F316	A182-F11
3	Wedge	A182-F6a	A182-F316	A182-F6a+HF
4	Stem	A276-410	A276-316	A276-410
5	Seat Ring	A276-410	A182-F316	A276-410+HF
6	Bonnet Gasket	Graphite+304	Gaphitr+316	Graphite+304
7	Bonnet Stud	A193-B7	A193-B8M	A193-B16
8	Packing	Graphite	Graphite	Graphite
9	Gland	A276-410	A276-316	A276-410
10	Gland Flange	A105	A182-F316	A182-F11
11	Eyebolt Pin	A276-410	A276-316	A276-410
12	Eyebolt	A193-B7	A193-B8M	A193-B16
13	Eyebolt Nut	A194-2H	A194-8M	A194-2H
14	Yoke Sleeve	A276-410	A194-410	A276-410
15	Handwheel	Malleable lion		
16	Handwheel Nut	Carbon Steel		

NOTE: 1) Other materials available

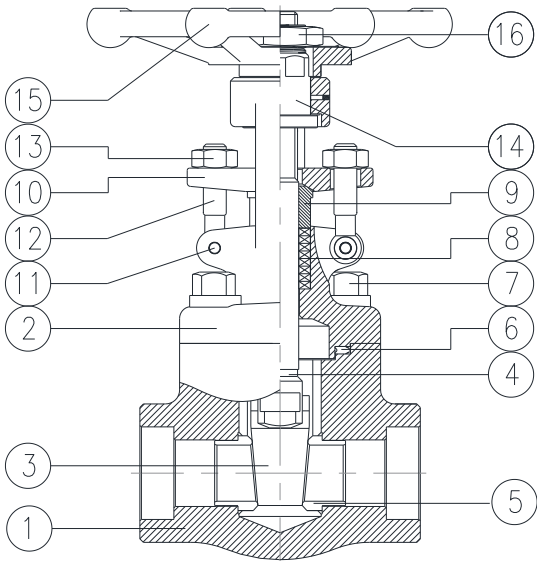


Figure 1- Outside Screw and Yoke Gate Valve

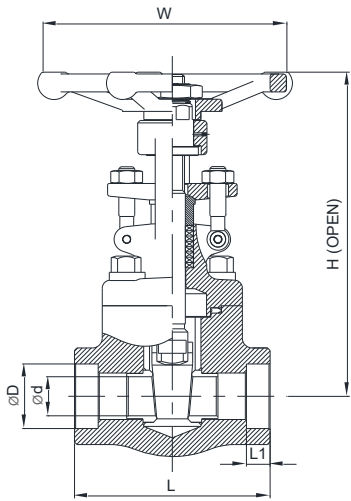
Manufacturing Program

Small forged steel valves in carbon and stainless steel
NPS 1/2"-2" (DN15-50)

Valve type	Bonnet type	Bonnet joint	Flanged ends	Threaded or socket weld		Butt weld ends	Male / Female ends
				Conventional port	Full port		
GATE	OS&Y	Bolted	150,300,600,1500,2500	800,1500,1690	800,1500	1500,2500	
	OS&Y	Welded	150,300,600,1500,2500,4500	800,1500,1690,2500,4500	800	1500,2500	800,1500

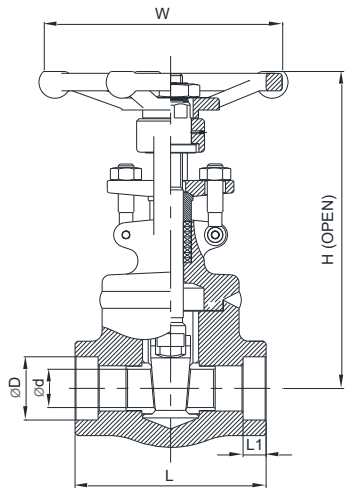
Features and benefits

- A compact but extremely sturdy design for high pressure-temperature service.
- Solid alloy wedge (optional) ensures low friction and long service life.
- For Class 1500 valves and for steam service, seats are seal-welded to the body.
- Packing rings are pressed to 4000 psi to provide a high integrity seal.
- For welded bonnet valves, the bonnet is threaded in and torque to an engineered torque value and the body bonnet joint is strength-welded, offering double protection against leakage. (Body/bonnet threads and strength-weld).
- Fully guided wedge reduces wear on seating surfaces.
- Repairable 2-piece stem drive.
- Parallel slide gate valves also available.



1.1. Bolted bonnet Full port Reducing port Outside & Yoke (OS&Y)

1.2. Threaded, Butt-welded or Socket welded ends design to API 602



2.1. Welded bonnet Full port Reducing port Outside & Yoke (OS&Y)

2.2. Threaded, Butt-welded or Socket welded ends design to API 602

Dimensions Data

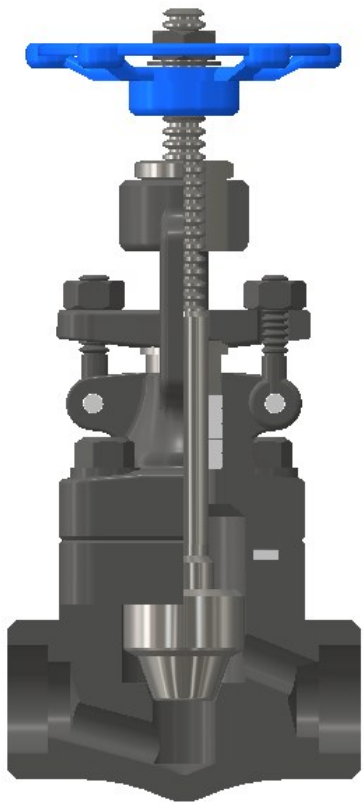
ANSI CLASS 800Lb								
NPS	DN	TYPE	L	Ød	ØD	L1	H	W
1/2"	15	FB	79	13	21.80	10	157	100
		RB	79	13	21.80	10	157	100
3/4"	20	FB	111	18	27.20	13	185	120
		RB	111	18	27.20	13	185	120
1	25	FB	120	24	33.90	13	226	160
		RB	120	18	33.90	13	226	160
1-1/2"	40	FB	140	36.5	48.80	13	270	220
		RB	140	29	48.80	13	270	220
2	50	FB	178	49	61.20	16.5	333	220
		RB	178	36.5	61.20	16.5	333	220

Dimensions Data

ANSI CLASS 800Lb								
NPS	DN	TYPE	L	Ød	ØD	L1	H	W
1/2"	15	FB	79	13	21.80	10	157	100
		RB	79	13	21.80	10	157	100
3/4"	20	FB	111	18	27.20	13	185	120
		RB	111	18	27.20	13	185	120
1	25	FB	120	24	33.90	13	226	160
		RB	120	18	33.90	13	226	160
1-1/2"	40	FB	140	36.5	48.80	13	270	220
		RB	140	29	48.80	13	270	220
2	50	FB	178	49	61.20	16.5	333	220
		RB	178	36.5	61.20	16.5	333	220

Forged Steel Globe Valve

Outside Screw & York Bolted Bonnet SW-API 602
NPS 1/2"-2", ASME CLASSES : 150-2500Lb



TSC Valve supplies API 602 forged steel globe valves sized from 1/2" to 2" which are widely utilized in high temperature and high pressure services. These compact(covering class 800~2500) steel globe valves, commonly seen in petroleum and natural gas industries, can be made from carbon steel, alloy steel, or stainless steel. End connections can be furnished as butt welding, flange, threaded, socket welding. Due to the small sizes and relatively low torque valve, API 602 forged steel globe valves are usually hand wheel operated.

DESIGN & MANUFACTURING STANDARDS

Basic Design : API 602
Face to Face Dimension : ASME B16.11
Flange End Dimension : ASME B16.5
Butt-Weld End Dimension : ASME B16.25
Socket-Weld End : ASME B16.11
Inspection & Testing : API 598

ASTM Main Parts and Materials

NO	Part Name	ASME Material		
1	Body	A105	A182-F316	A182-F11
2	Bonnet	A105	A182-F316	A182-F11
3	Wedge	A182-F6a	A182-F316	A182-F6a+HF
4	Stem	A276-410	A276-316	A276-410
5	Bonnet Gasket	Graphite+304	Gaphitr+316	Graphite+304
6	Bonnet Stud	A193-B7	A193-B8M	A193-B16
7	Packing	Graphite	Graphite	Graphite
8	Gland	A276-410	A276-316	A276-410
9	Gland Flange	A105	A182-F316	A182-F11
10	Eyebolt Pin	A276-410	A276-316	A276-410
11	Eyebolt	A193-B7	A193-B8M	A193-B16
12	Eyebolt Nut	A194-2H	A194-8M	A194-2H
13	Yoke Sleeve	A276-410	A194-410	A276-410
14	Handwheel	Malleable lion		
15	Handwheel Nut	Carbon Steel		

NOTE: 1) Other materials available

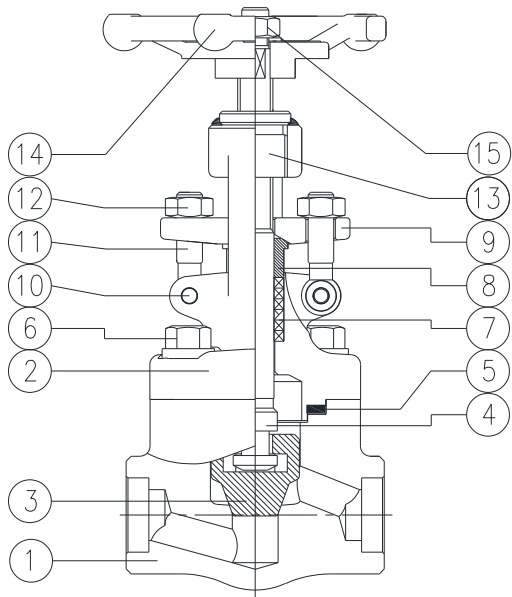


Figure 1- Outside Screw and Yoke Gate Valve

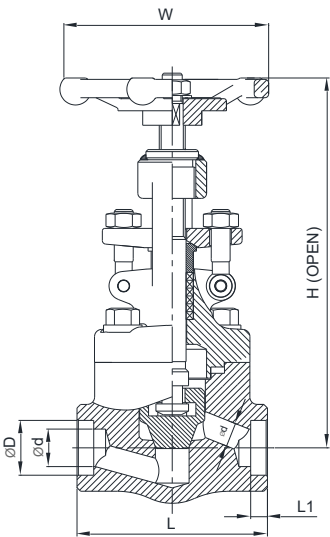
Manufacturing Program

Small forged steel valves in carbon and stainless steel
NPS 1/2"-2" (DN15-50)

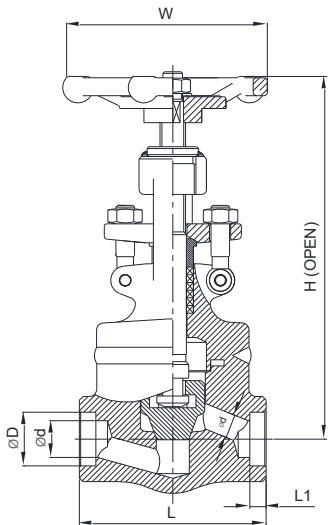
Valve type	Bonnet type	Bonnet joint	Flanged ends	Threaded or socket weld		Butt weld ends	Male / Female ends
				Conventional port	Full port		
Globe	OS&Y	Bolted	150,300,600,1500	800,1500,1690		1500	
		Welded	150,300,600,1500	800,1500,1690		1500	
		Y-pattern	1500,2500	1690,2680,4500	1690,2680,4500		

Features and benefits

- A compact but extremely sturdy design for high pressure-temperature service.
- Available types: Stop, Stop check, Needle, Flow control.
- Available with bolted or welded bonnet.
- Packing rings are pressed to 4000 psi to provide a high integrity seal.
- Repairable 2-piece stem drive.
- Available with double packing, leak-off connection and live-loading.



- 1.1. Bolted bonnet Full port Reducing port Outside & Yoke (OS&Y)
- 1.2. Threaded, Butt-welded or Socket welded ends design to API 602



- 2.1. Welded bonnet Full port Reducing port Outside & Yoke (OS&Y)
- 2.2. Threaded, Butt-welded or Socket welded ends design to API 602

Dimensions Data

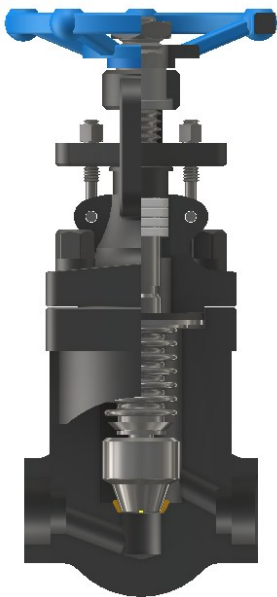
ANSI CLASS 800Lb								
NPS	DN		L	Ød	ØD	L1	H	W
1/2"	15	FB	79	13	21.80	10	157	100
		RB	79	9.5	21.80	10	157	100
3/4"	20	FB	111	18	27.20	13	185	120
		RB	111	12.5	27.20	13	185	120
1	25	FB	120	24	33.90	13	226	160
		RB	120	17.5	33.90	13	226	160
1-1/2"	40	FB	140	36.5	48.80	13	270	220
		RB	140	28.5	48.80	13	270	220
2	50	FB	178	49	61.20	16.5	333	220
		RB	178	36.5	61.20	16.5	333	220

Dimensions Data

ANSI CLASS 800Lb								
NPS	DN		L	Ød	ØD	L1	H	W
1/2"	15	FB	79	13	21.80	10	157	100
		RB	79	9.5	21.80	10	157	100
3/4"	20	FB	111	18	27.20	13	185	120
		RB	111	12.5	27.20	13	185	120
1	25	FB	120	24	33.90	13	226	160
		RB	120	17.5	33.90	13	226	160
1-1/2"	40	FB	140	36.5	48.80	13	270	220
		RB	140	28.5	48.80	13	270	220
2	50	FB	178	49	61.20	16.5	333	220
		RB	178	36.5	61.20	16.5	333	220

Bellow Sealed Globe Valve

Bolted Bonnet Full Port & Reducing Valve API 602
NPS 1/2"-2", ASME CLASSES : 150-2500Lb



TSC Bellows seal valves feature a formed multi-ply bellows welded to the stem and to the bottom of the bonnet, creating a hermetic seal or impermeable barrier. Bellows are available in many materials for virtually all corrosive chemical applications.

DESIGN & MANUFACTURING STANDARDS

Basic Design : API 602 / ASME B16.34 / MSS-SP 117
Flange End Dimension : ASME B16.5
Butt-Weld End Dimension ASME B16.25
Socket welded Dimension ASME B16.11
Inspection & Testing : API 598

DESIGN DESCRIPTION:

- BOLTED BONNET OS&Y
- WELDED BONNET OS&Y
- BELLOW TEST PRESSURE : 80PSI

ASTM Main Parts and Materials

NO	Part Name	ASME Material
1	Body	A105
2	Disc	A276 316L+Stl.No.6
3	Stem	A276 316L
4	Gasket	316L+GRAPHITE
5	Bonnet Bolt	A193-M8
6	Bonnet	A105N
7	Packing	PTFE
8	Gland Bolt	A193-B8
9	Gland Bolt Pin	A276 304
10	Gland	A276 420
11	Gland Flange	A105N
12	Gland Nut	A194 8
13	Stem Nut	A276 410
14	Washer	A276 410
15	Name Plate	ALUMINUM
16	Handwheel Nut	A108 1020
17	Handwheel	A197
18	Bellows	A240 316
19	Integral Seat	A105N+Stl.No.6

NOTE: 1) Other materials available

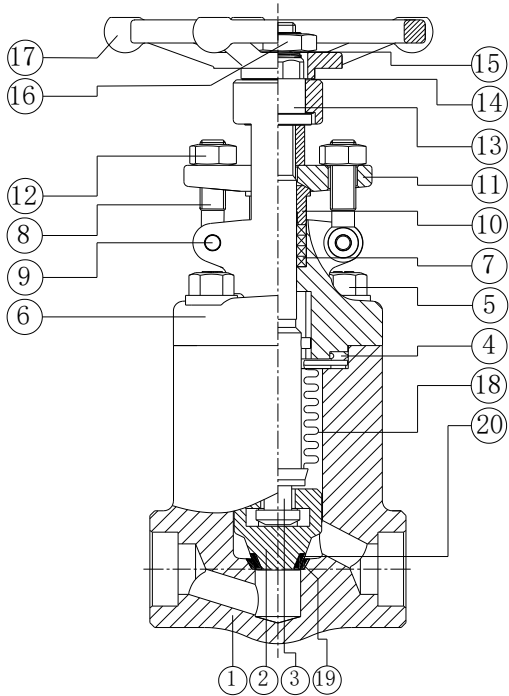


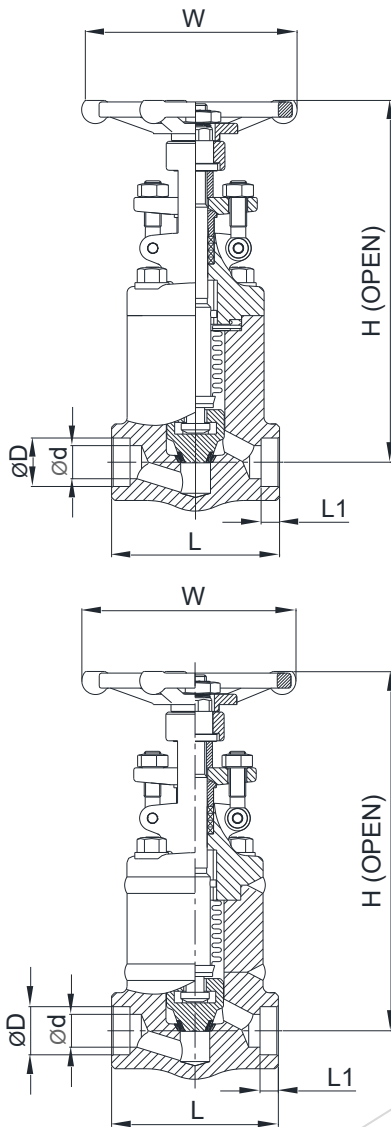
Figure 1- Lift Check Valve

PRESSURE / TEMPERATURE RATINGS

Material	Temp. F C	Working Pressure psig bar			Shell Test Pressure psig bar		
		600	900	1500	600	900	1500
A105	100	1480	2220	3705	2225 153	3350 231	5575 384
	38	102	153	256			
	800	825	1235	2060			
A182 Gr.F316	427	57	85	142	2175 150	3250 224	5400 372
	100	1440	2160	3600			
	38	99	149	248			
	1000	700	1050	1750			
	538	48	72	121			

Features and benefits

- Long cycle life bellows (10,000 cycles): Designed and qualification tested for high pressure/temperature applications.
- Bellows monitoring port (optional): A plug can be connected to the space above the bellows to monitor performance.
- Two secondary stem seals: a) Backseat in open position; b) Graphite packing.
- Superior seating faces: Seats hard-faced with Stellite 6, disc is solid Stellite 6.



- 1.1. Bolted bonnet Full port Reducing port Outside screw & Yoke (OS&Y)
- 1.2. Threaded, Butt-welded or Socket welded ends design to API 602
- 2.1. Welded bonnet Full port Reducing port Outside screw & Yoke (OS&Y)
- 2.2. Threaded, Butt-welded or Socket welded ends design to API 602

Dimensions Data

ANSI CLASS 800Lb								
NPS	DN		L	Ød	ØD	L1	H	W
1/2"	15	FB	79	13	21.80	10	157	100
		RB	79	9.5	21.80	10	161	100
3/4"	20	FB	111	18	27.20	13	185	120
		RB	92	12.5	27.20	13	161	100
1	25	FB	120	24	33.90	13	226	160
		RB	111	17.5	33.90	13	193	120
1-1/2"	40	FB	140	36.5	48.80	13	270	220
		RB	152	28.5	48.80	13	248	160
2	50	FB	178	49	61.20	16.5	333	220
		RB	172	36.5	61.20	16.5	282	220

Dimensions Data

ANSI CLASS 800Lb								
NPS	DN		L	Ød	ØD	L1	H	W
1/2"	15	FB	79	13	21.80	10	157	100
		RB	79	9.5	21.80	10	161	100
3/4"	20	FB	111	18	27.20	13	185	120
		RB	92	12.5	27.20	13	161	100
1	25	FB	120	24	33.90	13	226	160
		RB	111	17.5	33.90	13	193	120
1-1/2"	40	FB	140	36.5	48.80	13	270	220
		RB	152	28.5	48.80	13	248	160
2	50	FB	178	49	61.20	16.5	333	220
		RB	172	36.5	61.20	16.5	282	220

Forged Steel Lift Check Valve

Bolted Cover Lift Check Valve API 602
NPS 1/2"-2", ASME CLASSES : 150-2500Lb



TSC Lift Check Valves Refers to the valve that automatically opens and closes the valve flap by means of the flow of the medium itself, and is used to prevent the backflow of the medium, also known as check valve, check valve, counter flow valve, and back pressure valve.

The check valve is an automatic valve whose main function is to prevent backflow of the medium, prevent the pump and drive motor from reversing, and discharge the container medium. The check valve can also be used to supply a line in which the pressure may rise to an auxiliary system that exceeds the system pressure.

The check valve can be mainly divided into a swing type check valve (rotation according to the center of gravity) and a lift check valve (moving along the axis).

ASTM Main Parts and Materials

NO	Part Name	ASME Material		
1	Body	A105	A182-F316	A182-F11
2	Bonnet	A105	A182-F316	A182-F11
3	Disc	A182-F6a	A182-F316	A182-F6a+HF
4	Hinge	A276-410	A276-316	A276-410
5	Seat	A276-410	A182-F316-HF	A276-410+HF
6	Bonnet Gasket	Graphite+304	Graphite+316	Graphite+304
7	Bonnet Stud	A193-B7	A193-B8M	A193-B16

NOTE: 1) Other materials available

Manufacturing Program

Small forged steel valves in carbon and stainless steel
NPS 1/2"-2" (DN15-50)

Valve type	Bonnet type	Bonnet joint	Flanged ends	Threaded or SW Conventional port	Butt weld ends
Check	Piston	Bolted	150,300,600,1500	800,1500	1500
	Piston	Welded	150,300,600,1500	800,1500	1500
	Ball	Bolted	150,300,600	800,1500	1500
	Swing	Bolted	150,300,600	800	
	Swing	Coverless		800	
	Inclined Piston	Y-pattern	1500,2500	1690,2680,4500	1690,2680,4500

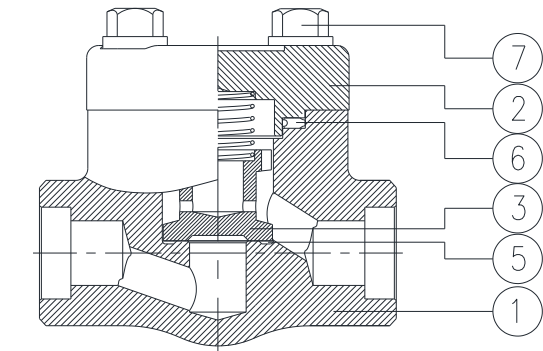


Figure 1- Lift Check Valve

DESIGN & MANUFACTURING STANDARDS

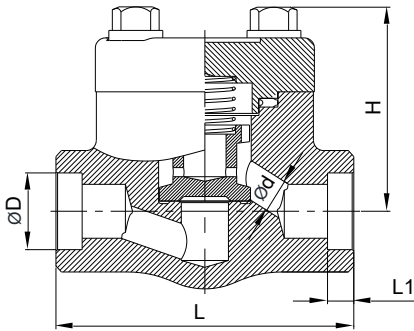
Basic Design : API 602
Face to Face Dimension : ASME B16.11
Flange End Dimension : ASME B16.5
Butt-Weld End Dimension : ASME B16.25
Socket-Weld End : ASME B16.11
Inspection & Testing : API 598

SWING CHECK DESCRIPTION

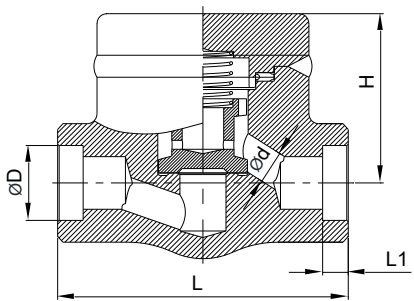
Prevent reversal of flow through pipe lines.
The swing check valve uses a hinged door to open during flow and to close against a pressure reversal. Swing check valve can be installed in horizontal or vertical upward flow piping. They offer low resistance to flow and are particularly suited to low velocity service

Features and benefits

- Available types: Piston, Ball, Swing check



- 1.1. Bolted Cover Piston Type
- 1.2. Threaded, Butt-welded or Socket welded ends design to API 602



- 2.1. Welded Bolted Cover Piston Type
- 2.2. Threaded, Butt-welded or Socket welded ends design to API 602

LIFT CHECK DESCRIPTION

They have an advantage over most other types of check valve in that they need only a relatively short lift to obtain full valve opening. The lift check valve uses a free-moving closure element that is placed above the seat. It prevents backflow and maintains pressure.

The lift check valve is recommended to install in horizontal piping lines because the disc is pushed up by the flow until the flow reverses when gravity and down stream pressure close the closure element against the seat.

Dimensions Data

ANSI CLASS 800Lb								
NPS	DN		L	Ød	ØD	L1	H	W
1/2"	15	FB	79	13	21.80	10	157	100
		RB	79	9.5	21.80	10		
3/4"	20	FB	92	18	27.20	13	185	120
		RB	92	12.5	27.20	13		
1	25	FB	120	24	33.90	13	226	160
		RB	120	17.5	33.90	13		
1-1/2"	40	FB	140	36.5	48.80	13	270	220
		RB	140	28.5	48.80	13		
2	50	FB	220	49	61.20	16.5	333	220
		RB	220	36.5	61.20	16.5		

Dimensions Data

ANSI CLASS 800Lb								
NPS	DN		L	Ød	ØD	L1	H	W
1/2"	15	FB	79	13	21.80	10	157	100
		RB	79	9.5	21.80	10		
3/4"	20	FB	92	18	27.20	13	185	120
		RB	92	12.5	27.20	13		
1	25	FB	120	24	33.90	13	226	160
		RB	120	17.5	33.90	13		
1-1/2"	40	FB	140	36.5	48.80	13	270	220
		RB	140	28.5	48.80	13		
2	50	FB	220	49	61.20	16.5	333	220
		RB	220	36.5	61.20	16.5		

TSC

TSC VALVE WITH DREAMS AND PASSIONS
꿈과 열정으로 고객감동을 실현하는 기업이 되겠습니다.



Ball Valve
API-6D
API-608
ASME B16.34

Floating Ball Valve

TSC

Full & Regular port flanged Ball Valves

NPS 1/2"-12", ASME CLASSES : 150Lb-1500Lb



TSC Valve manufactures some of the most dependable cast and forged steel Ball Valves in the industry. Our products are manufactured and tested in accordance with respective API, ASME, and ANSI standards. With features such as double block and bleed capabilities, secondary sealant injections, and spring energized self relieving seats, the **TSC** design offers many features and options beneficial for oil, gas, and liquid applications making it one of the most preferred ball valves on the market.

DESIGN & MANUFACTURING STANDARDS

Basic Design : API 6D / ASME B16.34
Face to Face Dimension : ASME B16.10
Flange End Dimension : ASME B16.5
Butt-Weld End Dimension ASME B16.11
Socket-Weld End : ASME B1.20.1
Inspection & Testing : API 598 / API 6D

ASTM Main Parts and Materials

NO	Part Name	Material		
1	Body	A216-WCB	A351-CF8	A351-CF8M
2	Body Cap	A216-WCB	A351-CF8	A351-CF8M
3	Bolt	A193-B7	A193-B8	A193-B8
4	Nut	A194-2H	A194-8	A194-8
5	Gasket	Graphite+Stainless steel		
6	Seat	PTFE, NYLON, PEEK, DEVLON		
7	Ball	A105+ENP	A182-F304	A182-F316
8	Small Spring	AISI 304	AISI 304	AISI 316
9	Small Ball	AISI 304	AISI 304	AISI 316
10	Stem	A182-F304	A182-F304	A182-F316
11	Packing	PTFE	PTFE	PTFE
12	Stem Seal	PTFE	PTFE	PTFE
13	Nut	A194-2H	A194-8	A194-8
14	Nut Washer	A240-304	A240-304	A240-304
15	O-Ring	VITON	VITON	VITON
16	Gland	A216-WCB	A276-304	A276-304
17	Dish Washer	SS304	SS304	SS304
18	Spring washer	SS304	SS304	SS304
19	Hexagon Bolt	A193-B7	A193-B8	A193-B8
20	Nut	A194-2H	A194-8	A194-8
21	Hexagon Socket	SS304	SS304	SS304
22	Handle	CS+PVC		
23	T-Wrench	A216-WCB	A216-WCB	A216-WCB
24	Screw	AISI 1035	AISI 1035	AISI 1035

NOTE: (1) A105+ENP optional
(2) Strain hardened.
(3) C-RPTFE for Class 600.
(4) Use graphite packing for service above 400° F (204° C).
(5) SS 316/CR plated for Class 600.
(6) On NPS 1/2 (DN 15) gland integral with gland flange.

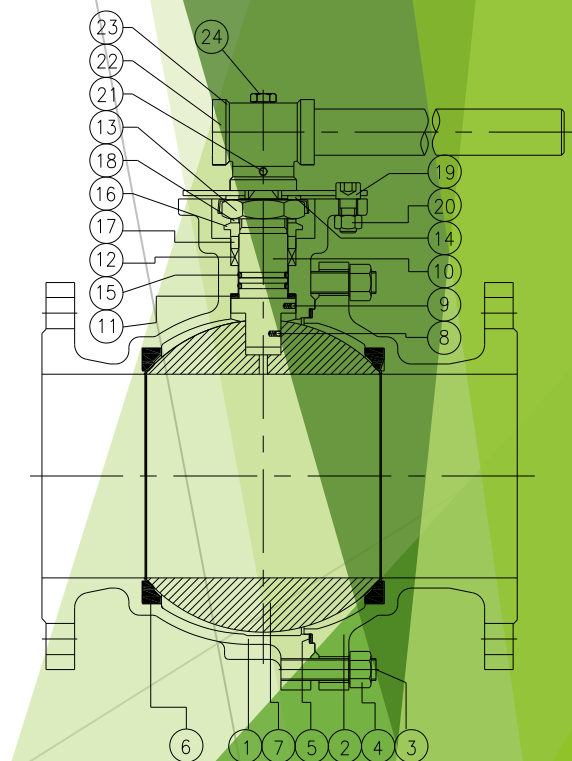
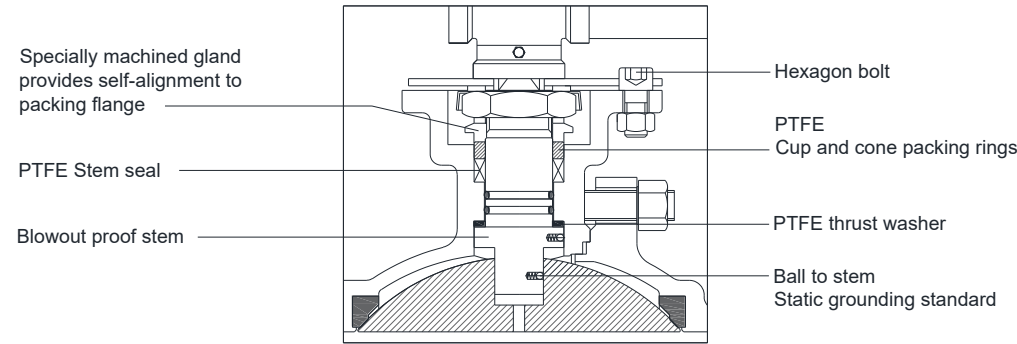


Figure1- Typical Floating Ball Valve Components (Two-Piece Body Illustrated)

FLOATING BALL SIZES: NPS (DN)			
CLASSES	150Lb	300Lb	600Lb
Full port	1/2"~8"	1/2"~6"	2"~3"
Regular port	2"~10"	2"~8"	2"~4"

Zero leakage packing chamber design

ASME CLASSES : 150-600



THE E-20 PACKING CHAMBER OUTPERFORMS COMPETITIVE DESIGNS

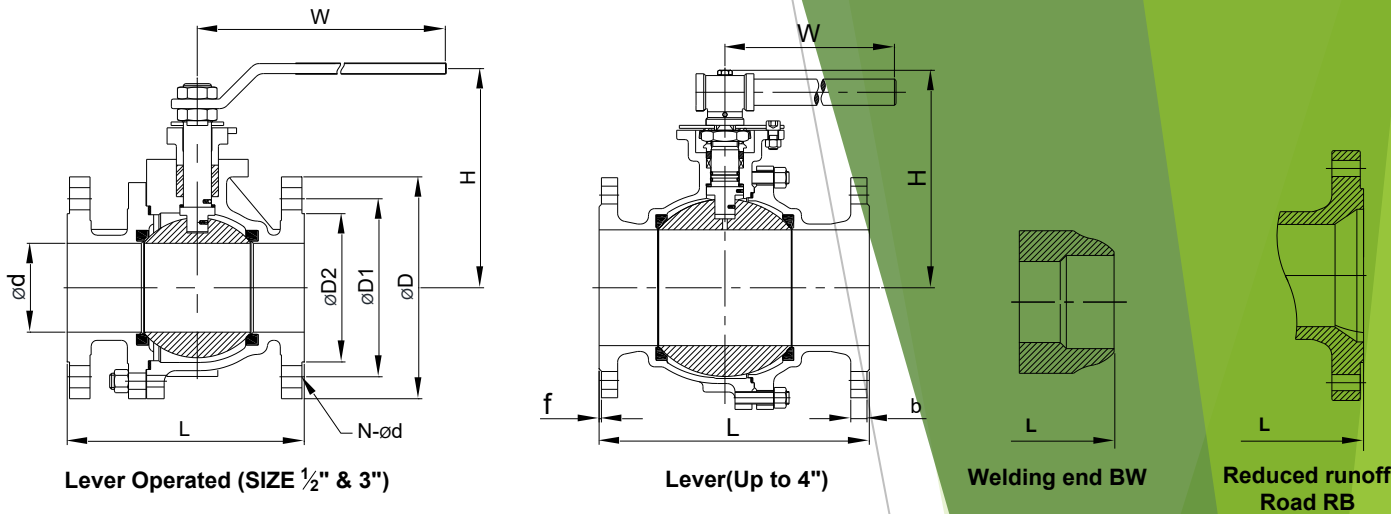
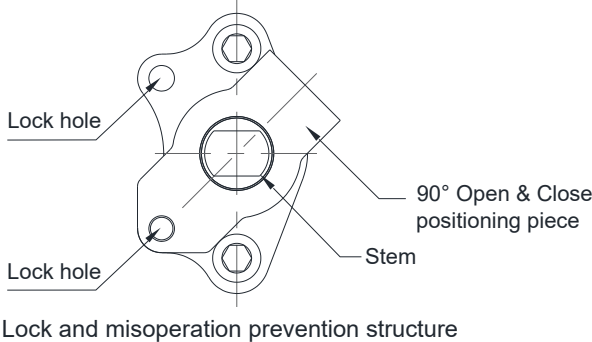
- Packing chamber design maintains low emissions control for long lasting high cycle life.
- Self-aligning packing flange is independent of gland for equal compression of packing rings.
- Upper and lower stem bushing prevent side load on packing rings. Eliminates premature wear, therefore enhancing packing life.
- Floating stem eliminates thrust washer wear.
- Stem shoulder assures blowout-proof safety.
- Cup and cone packing rings for directional compression for a tighter seal and longer life.
- Anti-static design
Ball-spring device eliminates static electrical buildup between stem, ball, and body NPS 1/2–12".
A separate external coil spring device that grounds stem to body is included in the full size range.

Memory seal split body ball valve function

FULL & REGULAR PORT FLANGED BALL VALVES NPS 1/2"-12", ASME CLASSES : 150-600

- Exclusive Memory seal seats compensate automatically for wear and fluctuations of pressure and temperature.
- Multiple solid cup and cone type PTFE stem seal or graphite packing.
- Two-piece self-aligning packing flange and gland.
- TA-Lift certified, (optional) PTFE and graphite packing.
- Stem guides reduce side thrust.
- Long cycle life.
- Low, uniform torques.
- Blowout-proof stem.
- Live-loaded thrust washer prevents galling and provides secondary stem seal.
- Fully enclosed spiral wound graphite filled stainless body gasket.
- Meets ASME B16.5, B16.10 and B16.34, API 608(4), API 598, API 607(5) Rev. 5/ ISO 10497
- ASME Section 8 mid flanges and bolting eliminates weak center section.
- UL approved, 150/300 NPS 1/2"–12" (optional).
- AGA and CGA approved, 150 full port NPS 1/2"–8" (optional)
- Face-to-face dimensions meet ASME B16.10 long pattern or short pattern. Refer to page 15 for actual dimensions.
- Locking devices standard on lever operated valves.
- Trunnion-mounted ball on larger valves allows the ball to float in case of fire and shut off on the secondary metal seat.
- Cavity fillers available for NPS 1/2"–12".

- Gear actuators standard(6):
150/300Lb: Full port: NPS 8"–24" (DN 200–600)
Regular port: NPS 10"–24" (DN 250–600)
600Lb: Full port: NPS 6"–12" (DN 150–300)
Regular port: NPS 8"–12" (DN 200–300)
- APPLICATIONS**
The valves can handle a vast variety of fluids, slurries, semi-solids and almost any corrosive service in chemical, oil, petrochemical, gas, pulp, paper processing and other industries. Standard valves with RPTFE seats can handle steam service to 150 psig. Valves with carbon graphite filled PTFE seats are suitable for steam up to 250 psig (17.2 bar).
- *These rugged, versatile, high-performance ball valves can meet NACE specifications(7).*
- *Fire tested in accordance with API 607(5). Rev. 5/ISO 10497. (See page 11 for details.)*

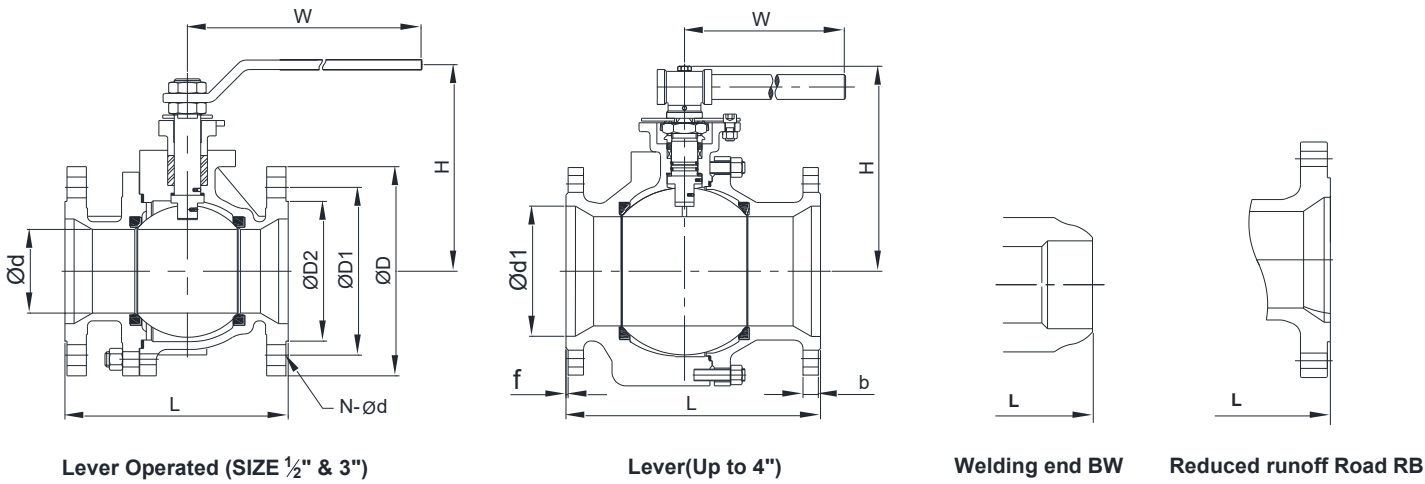


Full Bore Main External Dimensions

Pressure rating	Nominal Diameter		ød	Flanged		Butt Welding L(BW)	Raised Face Flange						W	Cast steel	Forged steel
	NPS	DN		L(RF)	L(RTJ)		D	D1	D2	f	b	n-ød		H	H
150Lb	1/2"	15	13	108	-	140	90	60.5	35	2	8	4-ø16	130	80	78
	3/4"	20	19	117	-	152	100	70	43	2	8.9	4-ø16	160	86	82
	1"	25	25	127	-	165	110	79.5	51	2	9.6	4-ø16	200	98	95
	1-1/2"	40	38	165	-	190	125	98.5	73	2	12.7	4-ø16	350	133	128
	2"	50	49	178	191	216	150	120.5	92	2	14.3	4-ø19	400	138	137
	3"	80	75	203	216	282	190	152.5	127	2	17.5	4-ø19	500	175	148
300Lb	4"	100	100	229	241	305	230	190.5	157	2	22.4	8-ø19	600	235	223
	1/2"	15	13	140	-	140	95	66.5	35	2	12.7	4-ø16	130	80	78
	3/4"	20	19	152	-	152	115	82.5	43	2	14.3	4-ø19	160	86	82
	1"	25	25	165	-	165	125	89	51	2	15.9	4-ø19	200	98	95
	1-1/2"	40	38	190	-	190	155	114.5	73	2	19.1	4-ø22	350	133	128
	2"	50	49	216	232	216	165	127	92	2	20.7	8-ø19	400	138	137
600Lb	3"	80	75	282	298	282	210	168.5	127	2	27	8-ø22	500	175	148
	4"	100	100	305	321	305	255	200	157	2	30.2	8-ø22	600	235	223

Pressure rating	Nominal Diameter		Flanged		Butt Welding L(BW)	H	Pressure rating	Nominal Diameter		Flanged		Butt Welding L(BW)	H
	NPS	DN	L(RF)	L(RTJ)				NPS	DN	L(RF)	L(RTJ)		
600Lb	1/2"	15	165	163	165	140	1500Lb	1/2"	15	216	216	216	140
	3/4"	20	190	190	190	140		3/4"	20	229	229	229	140
	1"	25	216	216	216	200		1"	25	254	254	254	200
	1-1/2"	40	241	241	241	250		1-1/2"	40	305	305	305	250
	2"	50	292	295	292	300		2"	50	368	371	368	300
	3"	80	356	359	356	500		2-1/2"	65	419	422	419	350
600Lb	4"	100	432	435	432	650		-	-	-	-	-	-

NOTE : (1) Drilled and faced as follows ASME B 16.5 & ASME B 16.47
(2) DN Dimensions are in millimeters



Reduced Bore Main External Dimensions

Pressure rating	Nominal Diameter		Ød	Ød1	Flanged		Butt Welding L(BW)	Raised Face Flange					W	Cast steel H	Forged steel H
	NPS	DN			L(RF)	L(RTJ)		D	D1	D2	f	b	n-Ød		
150Lb	3/4"x1/2"	20	13	19	117	-	152	100	70	43	2	10	4-Ø16	130	80
	1"x3/4"	25	19	25	127	-	165	110	79.5	51	2	11	4-Ø16	160	86
	1-1/4"x1"	32	25	32	140	-	178	115	89	64	2	11	4-Ø16	200	98
	1-1/2"x1-1/4"	40	32	38	165	-	190	125	98.5	73	2	13	4-Ø16	350	106
	2"x1-1/2"	50	38	50	178	191	216	150	120.5	92	2	14.5	4-Ø19	400	133
	3"x2"	80	50	75	203	216	283	190	152.5	127	2	17.5	4-Ø19	500	138

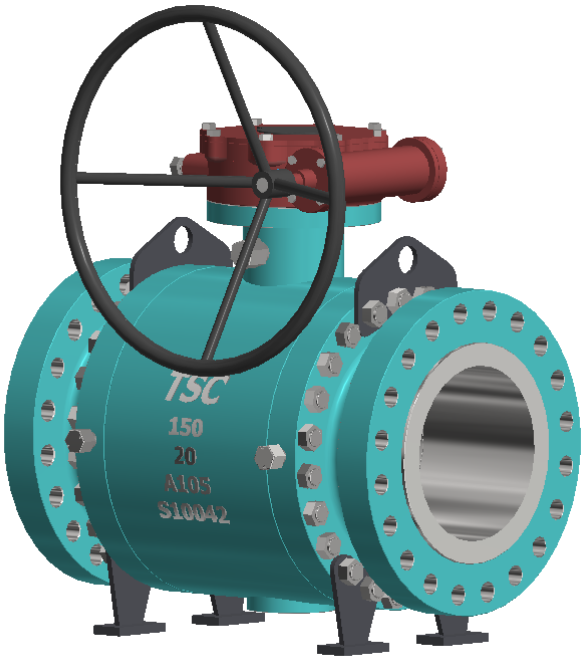
300Lb	3/4"x1/2"	20	13	19	152	-	152	115	82.5	43	2	14.5	4-Ø19	140	80
	1"x3/4"	25	19	25	165	-	165	125	89	51	2	16	4-Ø19	140	86
	1-1/4"x1"	32	25	32	178	-	178	135	98.5	64	2	17.5	4-Ø19	180	98
	1-1/2"x1-1/4"	40	32	38	190	-	190	155	114.5	73	2	19.5	4-Ø22	180	106
	2"x1-1/2"	50	38	50	216	232	216	165	127	92	2	21	8-Ø19	200	133
	3"x2"	80	50	75	283	298	283	210	168.5	127	2	27	8-Ø22	300	138

Pressure rating	Nominal Diameter		Flanged		Butt Welding L(BW)	H	Pressure rating	Nominal Diameter		Flanged		Butt Welding L(BW)	H
	NPS	DN	L(RF)	L(RTJ)				NPS	DN	L(RF)	L(RTJ)		
600Lb	3/4"x1/2"	20X15	191	191	191	82	1500Lb	3/4"x1/2"	20X15	229	229	229	85
	1"x3/4"	25X20	216	216	216	87		1"x3/4"	25X20	254	254	254	90
	1-1/2"x1"	40X25	241	241	241	98		1-1/2"x1"	40X25	305	305	305	98
	2"x1-1/2"	50X40	292	292	295	118		2"x1-1/2"	50X40	368	368	371	118
	3"x2"	80X50	356	356	359	130		-	-	-	-	-	-
	4"x3"	100X80	432	432	435	180		-	-	-	-	-	-

NOTE : (1) Drilled and faced as follows ASME B 16.5 & ASME B 16.47
(2) DN Dimensions are in millimeters

Trunnion Ball Valves

NPS 1/2"-32", ASME CLASSES : 150Lb-1500Lb



ASTM Main Parts and Materials

No.	Part Name	Materials
1	Body	A351-CF8M
2	Body Cap	A351-CF8M
3	Body Bolt	A193-B8M
4	Body Nut	A194-8M
5	Firesafe Ring	PTFE
6	Seat	RPTFE
7	Ball	A182-F316
8	Small Spring	ANSI 316
9	Small Ball	ANSI 316
10	Stem	A215-316
11	Thrust Washer	PTFE
12	Stem Seal	PTFE
13	Mounting Pad	A182-F316
14	Screw	A193-B8M
15	O-Ring	FKM
16	Gear	ASSEMBLY
17	Drain Plug	A182-F316
18	Bushing	SS+PTFE
19	Seat Ring	A182-F316
20	Grease Injection	A182-F316
21	Vent Plug	A182-F316
22	O-Ring	VITON
23	Firesafe Ring	GRAPHITE
24	Load Spring	17-7PH
25	Trunnion	A182-F316
26	Antistatic Spring	17-7PH
27	Bearing	316-PTFE
28	Connection Plate	A182-F316

DESIGN DESCRIPTION:

- FULL PORT DESIGN
- BB, BOLTED BONNET, SPLIT BODY
- THREE PIECE BODY FOR 12" & ABOVE
- TRUNNION MOUNTED BALL TYPE
- BLOW-OUT PROOF STEM
- FIRE DURABLE CONSTRUCTION
- ANTI STATIC DEVICE
- STOPPER DEVICE
- MOUNTING PAD ISO 5211
- FLANGED OR BUTT WELDING ENDS
- AVAILABLE WITH WG OPERATOR

DESIGN & MANUFACTURING STANDARDS

Basic Design : API 608 / API 6D / ASME B16.34
ISO 10434 / ISO 14313

Fire Test : API 607
ANTI Static : API 608
Face to Face Dimension : ASME B16.10
Flange End Dimension : ASME B16.5
Butt-Weld End Dimension : ASME B16.25
Butt-Weld End : ASME b16.25
Inspection & Testing : API 598 / API 6D

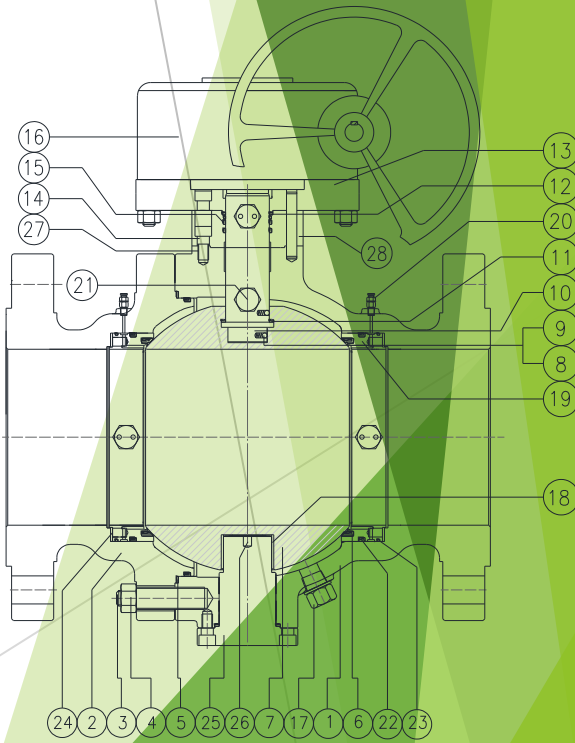


Figure2- Typical Trunnion-mounted Ball Valve Components (Split-body Valve Illustrated)



Trunnion ball valve function

DESIGN AND TEST

Ball valve are designed, constructed and tested According to API-6D standards.

DOUBLE BLOCK AND BLEED

All trunnion mounted type ball valve employ a sealing principle that facilitates all services requiring double block and bleed integrity.

DOUBLE PISTON EFFECT

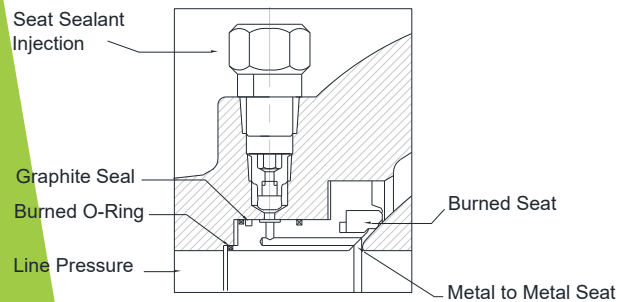
On request the seat rings design may be modified to perform the double piston effect action. In this case the pressure acting on both the external and internal side of the seat rings, results in force pushing the game against The ball, therefore each seat rings grants the required tightness even if the pressure is applied in the body cavity. This feature adds an extra sealing feature to the valve, but To release the possible over pressure developed into the body cavity it is necessary to use an external safety relief valve.

SEALING PRINCIPLE

All model trunnion mounted type ball valve are supplied with spring-loaded seats to ensure that the seats are always in contact with the ball. this design provide very efficient seal even at low line pressure. As the line pressure increases, the seat is forced into tighter contact with the ball providing a positive shut-off.

FIRE SAFE CONSTRUCTION

The secondary metal seat is provided to contact between the seat and ball in the event the primary non-metallic seat is destroyed by fire all trunnion mounted type ball valve are fire-safe designed. The double body and cap seals provide maximum security. It is fitted with special graphite seals so as to effectively preclude leakage in the event of fire. All top trunnion mounted ball valve have been tested to API-607 and API-6FA



SECONDARY SEAT AND STEM SEALING OPTION

All model trunnion mounted type ball valve are designed to provide high integrity shut-off. Upon request, sealant lubrication fittings are installed. In the event of seat insert or stem seal damage, external or internal leakage can occur. Emergency sealant injection can save the integrity of the valve by incorporating a sealant seal around the stem or between the seat and the ball until such time the valve may be properly serviced

AT ALL TIMES-STEM SEAL

This option provides premier valve stem sealing characteristics for adverse conditions of extreme pressure, temperature variations. Designed to meet the most stringent fugitive emission regulations, design is comprised of an extra deep stuffing box/packing/stem seal retainer & conical disc spring. The disc spring provide continuous compression of the packing assembly and compensate for wear.



ACTUATOR MOUNTING ISO 5211

All top flanged end products shall have an integrally Cast (ISO)actuator mounting pad. This feature provides for direct mount of gear operators or electric actuators. The additional cast for separate mounting bracket is eliminated.

STATIC SEALED STEM SEAL RETAINER

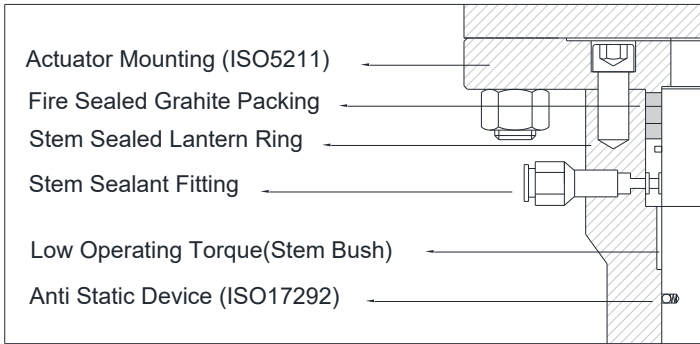
The stem seal retainer, with its(2) static Viton O-ring seals; Accepts the forces provided by the combination ISO Mounting pad/packing gland & transmits those forces as Packing/disc spring factory pre-load. A variety of O-ring Seals are available for those exceptionally demanding Applications. Field maintenance & costly repairs are Virtually eliminated.

SPRING FORCE

Optional conical disc springs insure adequate loading of Packing at all times. Excessive stem torque and packing Deformation due to over-tightening of conventional pack-Ing glands is eliminated. The constant “LOAD” provided By the disc springs compensates for normal wear-repair Nd maintenance costs are virtually eliminated.

PACKING

The high pressure/high temperature packing set is Comprised of self-cleaning, die-formed, high-density and low-density graphite molded packing materials. This unique design eliminates stem galling, lowers required valve stem torque and increases product performance.



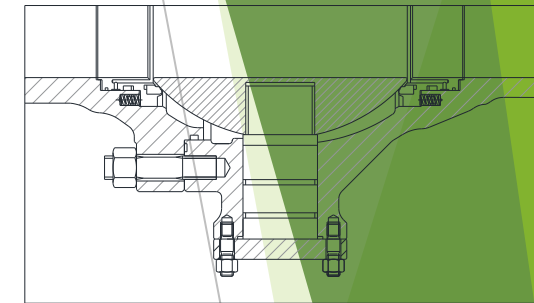
ANTI-STATIC DESIGN ISO17292

Ball valve present a particular problem with the build up of static electricity around the ball. They have anti-static design which provides contact between stem and ball, and stem and body to eliminate static electricity.

TRUNNION LOW STEM DESIGN

Trunnion mount design locates the low stem trunnion assembly within the confines of body & cap. In so doing, both the line pressure and media act upon all valve cavity components equally.

- The advantages of such a design include:
1. The pressure & media does not concentrate in one location only, instead the forces are dispersed equally throughout the pressurized areas.
 2. Ball movement and side loading of lower stem is minimized, thereby decreasing operational torque valve and improving stem seal life end.
 3. Guarantee the low torque and extend valve life.

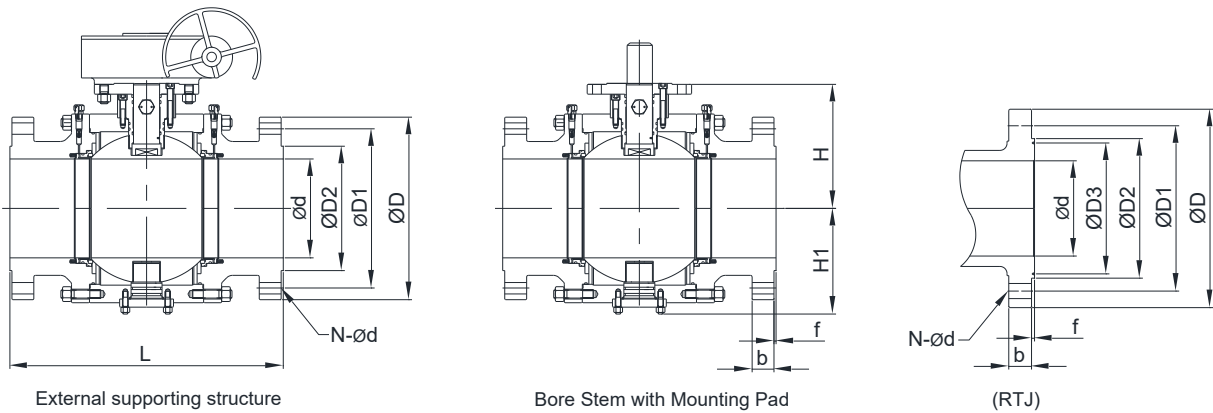


UNIQUE DOUBLE SEALING DESIGN AND METAL TO METAL CONTACT

The PTFE gasket acts as the primary seal for top union body ball valve. the secondary seal is made of flexible graphite; A material with extremely good resistance to fire conditions.

Application of seat per temperature

Class	Seat Materials	Design Temperature
150Lb	RTFE	-50°C~+180°C
300Lb	RTFE	-50°C~+150°C
600Lb	RTFE	-50°C~+100°C
900Lb	NYLON (DEVLON)	-45°C~+190°C
1500Lb	NYLON (DEVLON)	-45°C~+170°C
2500Lb	NYLON (DEVLON)	-45°C~+160°C
All Class	PEEK	200°C & OVER
All Class	METAL	200°C & OVER



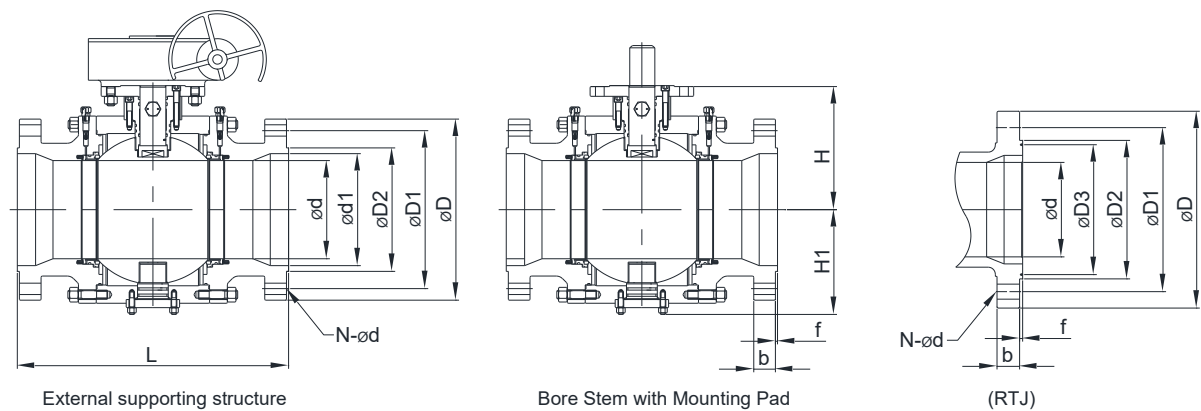
Full Bore Main External Dimensions

Pressure rating	Nominal Diameter		ød	Flanged		Butt Welding	Raised Face Flange						General	
	NPS	DN		L(RF)	L(RTJ)		D	D1	D2	f	b	n-ød	H	H1
150Lb	2"	50	50	178	191	216	150	120.5	92	2	14.5	4-ø19	93	88
	3"	80	75	203	216	283	190	152.5	127	2	17.5	4-ø19	118.5	117
	4"	100	100	229	241	305	230	190.5	157	2	22.5	8-ø19	143.5	137
	6"	150	150	394	406	457	280	241.5	216	2	24	8-ø22	208	178.5
	8"	200	201	457	470	521	345	298.5	270	2	27	8-ø22	248	222
	10"	250	252	533	546	559	405	362	324	2	29	12-ø25	294	265
	12"	300	303	610	622	635	485	432	381	2	30.5	12-ø25	344.5	308.5
	14"	350	334	686	699	762	535	476	413	2	33.5	12-ø29	377	334
	16"	400	385	762	775	838	595	540	470	2	35	16-ø29	418	375
	18"	450	436	864	876	914	635	578	533	2	38.5	16-ø32	463	410
	20"	500	487	914	927	991	700	635	584	2	41.5	20-ø32	502	458
	24"	600	589	1067	1080	1143	815	749.5	692	2	46.5	20-ø35	586	534
	26"	650	633	1143	-	1245	870	806.5	749	2	68	24-ø35	626	582
	28"	700	684	1245	-	1346	927	864	800	2	71	28-ø35	644	605
	30"	750	735	1295	-	1397	984	914.5	857	2	75	28-ø35	720	672
	32"	800	779	1372	-	1524	1060	978	914	2	81	28-ø41	742	704
300Lb	36"	900	874	1524	-	1727	1168	1086	1022	2	90	32-ø41	839	796
	40"	1000	976	1753	-	-	1289	1200	1124	2	90	36-ø41	913.5	866
	42"	1050	1020	1855	-	-	1346	1257	1194	2	97	36-ø41	943	881
	2"	50	50	216	232	216	165	127	92	2	21	8-ø19	93	88
	3"	80	75	283	298	283	210	168.5	127	2	27	8-ø22	118.5	117
	4"	100	100	305	321	305	255	200	157	2	30.5	8-ø19	143.5	137
	6"	150	150	403	419	457	320	270	216	2	35	8-ø22	208	178.5
	8"	200	201	502	518	521	380	330	270	2	40	12-ø22	248	222
	10"	250	252	568	584	559	445	387.5	324	2	46.5	12-ø25	294	265
	12"	300	303	648	664	635	520	451	381	2	49.5	16-ø29	344.5	308.5
	14"	350	334	762	778	762	585	514.5	413	2	52.5	16-ø32	377	334
	16"	400	385	838	854	838	650	571.5	470	2	56	20-ø32	423	380
	18"	450	436	914	930	914	710	628.5	533	2	59	20-ø35	463	410
	20"	500	487	991	1010	991	775	686	584	2	62	24-ø35	502	458
	24"	600	589	1143	1165	1143	915	813	692	2	68.5	24-ø35	592	549
	26"	650	633	1245	-	1245	972	87.5	749	2	79	28-ø45	633	590
	28"	700	684	1346	-	1346	1035	940	800	2	86	28-ø45	680	737
	30"	750	735	1397	-	1397	1092	997	857	2	92	28-ø45	730	682
	32"	800	779	1524	-	1524	1149	1054	914	2	98	32-ø54	765	720
	36"	900	874	1727	-	1727	1270	1168	1022	2	105	32-ø54	847	804
	40"	1000	976	1956	-	-	1238	1156	1086	2	114	32-ø45	921	877
	42"	1050	1020	2083	-	-	1289	1206.5	1137	2	119	32-ø45	936	900

NOTE : (1) Drilled and faced as follows ASME B 16.5 & ASME B 16.47
(2) DN Dimensions are in millimeters

Full Bore Main External Dimensions

Pressure rating	Nominal Diameter		ød	Flanged		Butt Welding	Raised Face Flange						General	
	NPS	DN		L(RF)	L(RTJ)		L(BW)	D	D1	D2	f	b	n-ød	H
600Lb	2"	50	50	292	295	292	165	127	92	7	26	8-ø19	107	91.5
	3"	80	75	356	359	356	210	168.5	127	7	32	8-ø22	140	119
	4"	100	100	432	435	432	275	216	157	7	38.5	8-ø25	164	150
	6"	150	150	559	562	559	355	292	216	7	48	12-ø29	222	192.5
	8"	200	201	660	664	660	420	349	270	7	56	12-ø32	271	235
	10"	250	252	787	791	787	510	432	324	7	64	16-ø35	317.5	280
	12"	300	303	838	841	838	560	489	381	7	67	20-ø35	360	320
	14"	350	334	889	892	889	605	527	413	7	70	20-ø39	390	350
	16"	400	385	991	994	991	685	603	470	7	77	20-ø41	440	395
	18"	450	436	1092	1095	1092	745	654	533	7	83	20-ø44	485	439
	20"	500	487	1194	1200	1194	815	724	584	7	89	24-ø44	533	490
	24"	600	589	1397	1407	1397	940	838	692	7	102	24-ø51	616	573
	26"	650	633	1448	-	1448	1016	914.5	749	7	108	28-ø51	643.5	612
	28"	700	684	1549	-	1549	1073	965	800	7	112	28-ø54	665	670
	30"	750	735	1651	-	1651	1130	1022	857	7	114	28-ø54	753	710
32"	800	779	1778	-	1778	1194	1079.5	914	7	118	28-ø54	768	780	
36"	900	874	2083	-	2083	1314	1194	1022	7	124	28-ø67	861	840	
900Lb	2"	50	50	368	371	368	215	165	124	7	38.5	8-ø25	126.5	105
	3"	80	75	381	384	381	240	190.5	156	7	38.5	8-ø25	150	130
	4"	100	100	457	460	457	290	235	181	7	45	8-ø32	172.5	158
	6"	150	150	610	613	610	380	317.5	241	7	56	12-ø32	230	197
	8"	200	201	737	740	737	470	393.5	308	7	64	12-ø39	285	250
	10"	250	252	838	841	838	545	470	362	7	70	16-ø39	330	294
	12"	300	303	965	968	965	610	533.5	419	7	79.5	20-ø39	366	334
	14"	350	334	1029	1038	1029	640	559	467	7	86	20-ø42	415	368
	16"	400	385	1130	1140	1130	705	616	524	7	89	20-ø45	452	408
	18"	450	436	1219	1232	1219	785	686	594	7	102	20-ø51	501	461
	20"	500	487	1321	1334	1321	855	749.5	648	7	108	20-ø54	544	506
	24"	600	589	1549	1568	1549	1040	901.5	772	7	140	20-ø67	657	616
	26"	650	633	1651	-	1651	1086	952.5	749	7	140	20-ø73	700	635
	28"	700	684	1753	-	1753	1168	1022	800	7	143	20-ø79	727	685
	30"	750	735	1880	-	1880	1232	1086	857	7	149	20-ø79	760	722
32"	800	779	2032	-	2032	1314	1156	914	7	159	20-ø86	795	755	
36"	900	874	2286	-	2286	1461	1289	1022	7	172	20-ø92	886	846	
1500Lb	2"	50	50	368	371	368	215	165	124	7	38.5	8-ø25	126.5	105
	3"	80	75	470	473	470	265	203.2	168	7	48	8-ø32	166	149
	4"	100	100	546	549	546	310	241.3	194	7	54	8-ø35	219	178
	6"	150	144	705	711	705	395	317.5	248	7	83	12-ø39	268	227
	8"	200	192	832	841	832	485	393.7	318	7	92	12-ø45	303	267
	10"	250	239	991	1000	991	585	482.6	371	7	108	12-ø51	358	323
	12"	300	287	1130	1146	1130	675	571.5	438	7	124	16-ø54	414	381
	14"	350	315	1257	1276	1257	750	635	489	7	134	16-ø60	471	432
	16"	400	360	1384	1407	1384	825	704.8	546	7	146.5	16-ø67	498	453
	18"	450	406	1537	1559	-	915	774.7	613	7	162	16-ø73	570	530
	20"	500	454	1664	1686	-	985	831.8	673	7	178	16-ø79	611	569
2500Lb	2"	50	42	451	454	451	235	171.4	133	7	51	8-ø29	149	123
	3"	80	62	578	584	578	305	228.6	168	7	67	8-ø35	215	171
	4"	100	87	673	683	673	355	273	203	7	76.5	8-ø42	245	206
	6"	150	131	914	927	914	485	368.3	279	7	108	8-ø54	306	263
	8"	200	179	1022	1038	1022	550	438.2	340	7	127	12-ø54	361	330
	10"	250	223	1270	1292	1270	675	539.8	425	7	166	12-ø67	426	388
12"	300	265	1422	1445	1422	760	619.1	495	7	185	12-ø74	479	440	



Reduced Bore Main External Dimensions

Pressure rating	Nominal Diameter		ød	ød1	Flanged		Butt Welding	Raised Face Flange						General	
	NPS	DN			L(RF)	L(RTJ)		D	D1	D2	f	b	n-ød	H	H
150Lb	3"X2"	80	50	75	203	216	283	190	152.5	127	2	17.5	4-ø19	93	88
	4"X3"	100	75	100	229	241	305	230	190.5	157	2	22.5	8-ø19	118.5	117
	6"X4"	150	100	150	394	406	457	280	241.5	216	2	24	8-ø22	143	137
	8"X6"	200	150	201	457	470	521	345	298.5	270	2	27	8-ø22	208	178.5
	10"X8"	250	201	252	533	546	559	405	362	324	2	29	12-ø25	248	222
	12"X10"	300	252	303	610	622	635	485	432	381	2	30.5	12-ø25	294	265
	14"X10"	350	252	334	686	699	762	535	476	413	2	33.5	12-ø29	294	265
	14"X12"	350	303	334	686	699	762	535	476	413	2	33	12-ø29	344.5	308.5
	16"X12"	400	303	385	762	775	838	595	540	470	2	35	16-ø29	344.5	308.5
	16"X14"	400	334	385	762	775	838	595	540	470	2	35	16-ø29	377	334
	18"X16"	450	385	436	864	876	914	635	578	533	2	38.5	16-ø32	418	375
	20"X16"	500	385	487	914	927	991	700	635	584	2	41.5	20-ø32	418	375
	20"X18"	500	436	487	914	927	991	700	635	584	2	41.5	20-ø32	463	410
	24"X20"	600	487	589	1067	1080	1143	815	749.5	692	2	46.5	20-ø35	502	458
	30"X24"	750	589	735	1295	-	1397	984	914.5	857	2	75	28-ø35	586	534
	36"X30"	900	735	874	1524	-	1727	1168	1086	1022	2	90	32-ø41	720	672
300Lb	3"X2"	80	50	75	283	298	283	210	168.5	127	2	27	8-ø22	93	88
	4"X3"	100	75	100	305	321	305	255	200	157	2	30.5	8-ø22	118.5	117
	6"X4"	150	100	150	403	419	457	320	270	216	2	35	12-ø22	143.5	137
	8"X6"	200	150	201	502	518	521	380	330	270	2	40	12-ø25	208	178.5
	10"X8"	250	201	252	568	584	559	445	387.5	324	2	46.5	16-ø29	248	222
	12"X10"	300	252	303	648	664	635	520	451	381	2	49.5	16-ø32	294	265
	14"X10"	350	252	334	762	778	762	585	514.5	413	2	52.5	20-ø32	294	265
	14"X12"	350	303	334	762	778	762	585	514.5	413	2	52.5	20-ø32	344.5	308.5
	16"X12"	400	303	385	838	854	838	650	571.5	470	2	56	20-ø35	344.5	308.5
	16"X14"	400	334	385	838	854	838	650	571.5	470	2	56	20-ø35	377	334
	18"X16"	450	385	436	914	930	914	710	628.5	533	2	59	24-ø35	423	380
	20"X16"	500	385	487	991	1010	991	775	686	584	2	62	24-ø35	423	380
	20"X18"	500	436	487	991	1010	991	775	686	584	2	62	24-ø35	463	410
	24"X20"	600	487	589	1143	1165	1143	915	813	692	2	68.5	24-ø41	502	458
	30"X24"	750	589	735	1397	-	1397	1092	997	857	2	92	28-ø48	592	549
	36"X30"	900	735	874	1727	-	1727	1270	1168	1022	2	105	32-ø54	730	682

NOTE : (1) Drilled and faced as follows ASME B 16.5 & ASME B 16.47
(2) DN Dimensions are in millimeters

Reduced Bore Main External Dimensions

Pressure rating	Nominal Diameter		ød	ød1	Flanged		Butt Welding	Raised Face Flange						General	
	NPS	DN			L(RF)	L(RTJ)		L(BW)	D	D1	D2	f	b	n-ød	H
600Lb	3"X2"	80	50	75	356	359	356	210	168.5	127	7	32	8-ø22	107	91.5
	4"X3"	100	75	100	432	435	432	275	216	157	7	38.5	8-ø25	140	119
	6"X4"	150	100	150	559	562	559	355	292	216	7	48	12-ø29	167	150
	8"X6"	200	150	201	660	664	660	420	349	270	7	56	12-ø32	222	192.5
	10"X8"	250	201	252	787	791	787	510	432	324	7	64	16-ø35	271	235
	12"X10"	300	252	303	838	841	838	560	489	381	7	67	20-ø35	317.5	280
	14"X10"	350	252	334	889	892	889	605	527	413	7	70	20-ø39	317.5	280
	14"X12"	350	303	334	889	892	889	605	527	413	7	70	20-ø39	360	320
	16"X12"	400	303	385	991	994	991	685	603	470	7	77	20-ø41	360	320
	16"X14"	400	334	385	991	994	991	685	603	470	7	77	20-ø41	390	350
	18"X16"	450	385	436	1092	1095	1092	745	654	533	7	83	20-ø44	440	395
	20"X16"	500	385	487	1194	1200	1194	815	724	584	7	89	24-ø44	440	395
	20"X18"	500	436	487	1194	1200	1194	815	724	584	7	89	24-ø44	485	439
	24"X20"	600	487	589	1397	1407	1397	940	838	692	7	102	24-ø51	533	490
	30"X24"	750	589	735	1651	-	1651	1130	1022	857	7	114	28-ø54	616	573
	36"X30"	900	735	874	2083	-	2083	1314	1194	1022	7	124	28-ø67	753	710
900Lb	3"X2"	80	50	75	381	384	381	240	190.5	156	7	38.5	8-ø25	126.5	105
	4"X3"	100	75	100	457	460	457	290	235	181	7	45	8-ø32	150	130
	6"X4"	150	100	150	610	613	610	380	317.5	241	7	56	12-ø32	172.5	158
	8"X6"	200	150	201	737	740	737	470	393.5	308	7	64	12-ø39	230	197
	10"X8"	250	201	252	838	841	838	545	470	362	7	70	16-ø39	285	250
	12"X10"	300	252	303	965	968	965	610	533.5	419	7	79.5	20-ø39	330	294
	14"X10"	350	252	322	1029	1038	1029	640	559	467	7	86	20-ø42	330	294
	14"X12"	350	303	322	1029	1038	1029	640	559	467	7	86	20-ø42	366	334
	16"X12"	400	303	373	1130	1140	1130	705	616	524	7	89	20-ø45	366	334
	16"X14"	400	322	373	1130	1140	1130	705	616	524	7	89	20-ø45	415	368
	18"X16"	450	373	423	1219	1232	1219	785	686	594	7	102	20-ø51	452	408
	20"X16"	500	373	471	1321	1334	1321	855	749.5	648	7	108	20-ø54	452	408
	20"X18"	500	373	471	1321	1334	1321	855	749.5	648	7	108	20-ø54	501	461
	24"X20"	600	471	570	1549	1568	1549	1040	901.5	772	7	140	20-ø67	544	506
	30"X24"	750	570	712	1880	-	1880	1232	1086	857	7	149	20-ø79	657	616
	36"X30"	900	712	855	2286	-	2286	1461	1289	1022	7	172	20-ø92	760	722
1500Lb	3"X2"	80	50	75	470	473	470	265	203.2	168	7	38.5	8-ø32	126.5	105
	4"X3"	100	74	100	546	549	546	310	241.3	194	7	54	8-ø35	166	149
	6"X4"	150	100	144	705	711	705	395	317.5	248	7	83	12-ø39	219	178
	8"X6"	200	144	192	832	841	832	485	393.7	318	7	92	12-ø45	268	227
	10"X8"	250	192	239	991	1000	991	585	482.6	371	7	108	12-ø51	303	267
	12"X10"	300	239	287	1130	1146	1130	675	571.5	438	7	124	12-ø54	358	323
	14"X10"	350	239	315	1257	1276	1257	750	635	489	7	134	16-ø60	358	323
	14"X12"	350	287	315	1257	1276	1257	750	635	489	7	134	16-ø60	414	381
	16"X12"	400	287	360	1384	1407	1384	825	704.8	546	7	146.5	16-ø67	414	381
	16"X14"	400	315	360	1384	1407	1384	825	704.8	546	7	146.5	16-ø67	471	432
	18"X16"	450	360	406	1537	1559	-	915	774.7	613	7	162	16-ø73	498	453
	20"X16"	500	360	454	1664	1686	-	985	831.8	673	7	178	16-ø79	498	453
	20"X18"	500	406	454	1664	1686	-	985	831.8	673	7	178	16-ø79	570	530
2500Lb	3"X2"	80	42	62	578	584	578	305	228.6	168	7	67	8-ø35	149	123
	4"X3"	100	62	87	673	683	673	355	273	203	7	76.5	8-ø82	215	171
	6"X4"	150	87	131	914	927	914	485	368.3	279	7	108	8-ø54	245	206
	8"X6"	200	131	179	1022	1038	1022	550	438.2	340	7	127	12-ø54	306	263
	10"X8"	250	179	223	1270	1292	1270	675	539.8	425	7	166	12-ø67	361	330
	12"X10"	300	223	265	1422	1445	1422	760	619.1	495	7	185	12-ø74	426	388

TSC

TSC VALVE WITH DREAMS AND PASSIONS
꿈과 열정으로 고객감동을 실현하는 기업이 되겠습니다.



Butterfly Valve
Category "A", "B"
API-609

Butterfly Valves

TSC

Concentric Butterfly Valve

Category A Butterfly Valve API 602
NPS 2"-12", ASME CLASSES : 150-300Lb



The **TSC** Valve Butterfly Valves' robust and rugged design can be relied upon for years of trouble free service. **TSC** Valves Butterfly Valves have a 100% bubble tight seal via a 316 stainless steel ring located in the body and the rubber seat located on the vane.

This superior design provides ease of adjustment along with ensured dependability expected in any distribution system or plant installation.

DESIGN & MANUFACTURING STANDARDS

Basic Design : API 609
Category : "A"
Face to Face Dimension: ASME V16.10
Flange End Dimension : ASME B16.5
Inspection & Testing : API 598

- FOR DUCTILE IRON, ASME B16.42
- FOR STEEL & STAINLESS STEEL, ASME B 16.34

ASTM Main Parts and Materials

No.	PART NAME	ASTM MATERIAL	
		GRAD TRADEMARK	CASTING
1	Body	A216-WCB, A351-CF8	FC20, FCD45, SSC13
2	Disc	A351-CF8	SSC13
3	Shaft	A479-410	SUS410
4	Seat	EPDM & NBR	EPDM & NBR
5	Packing	Q235	Q235
6	Top Flange Stud	A193-B7	A193-B7
7	Top Flange Stud Nut	A194-2H	A194-2H
8	Bushing	SUS304	SUS304
9	Transmission mode	WORM GEAR & STEEL LEVER & ELECTRIC	
10	Indictor	STEEL PLATE	STEEL PLATE
11	Name Plate	ALUMINUM	ALUMINUM
12	Disc Pin	SUS304	SUS304

NOTE: 1) Other materials available

Concentric Butterfly Valve Wafer L/O DWG.

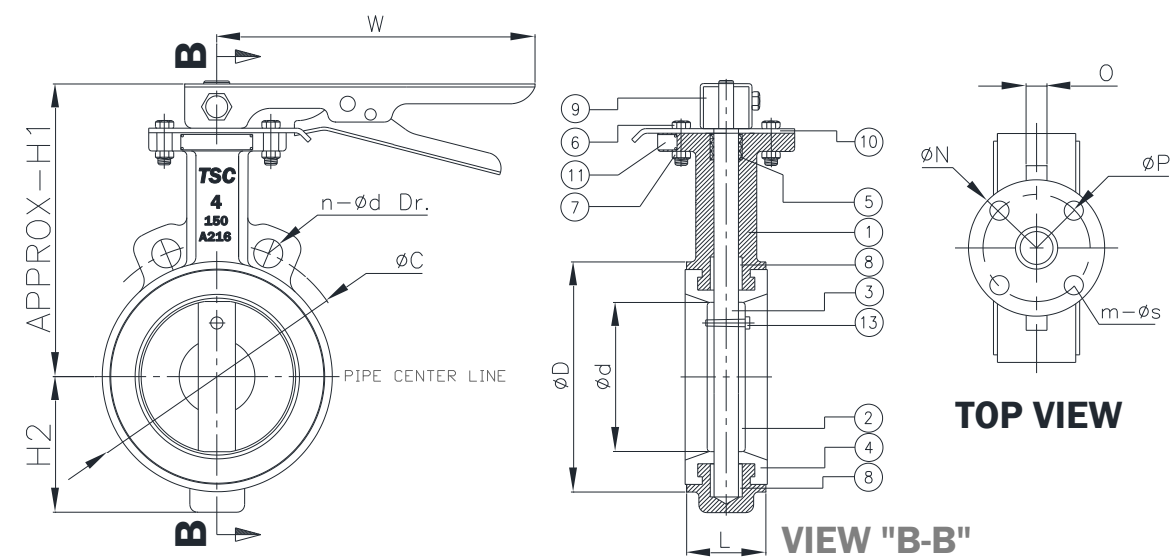


Figure 1- Wafer type Butterfly Valve L/O

Concentric Butterfly Valve Wafer G/O DWG.

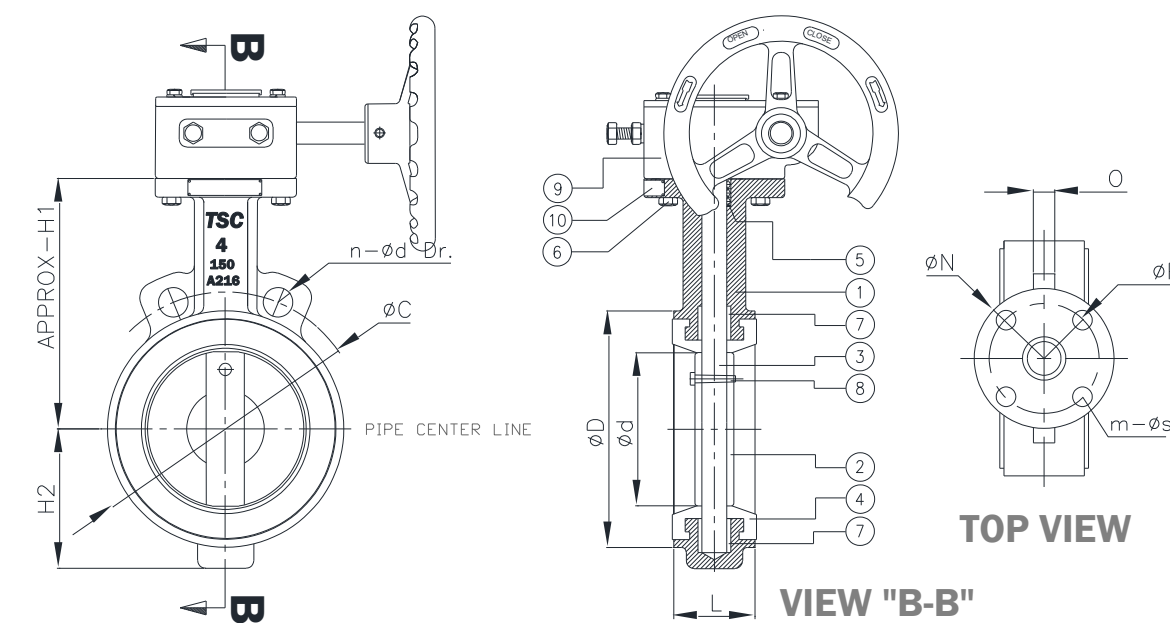


Figure 2- Wafer Butterfly Valve G/O

MANUFACTURING KS(KOREA) STANDARD.

- WAFER TYPE EPDM SEAT ,KS B 2813
- FOR GRAY CAST IRON, KS D 4301
- FOR DUCTILE IRON, KS D 4302
- FACE TO FACE, KS B 1511
- INSPECTION AND TEST, KS B 2304

Butterfly Valve Dimensions

NPS	DN	øD	ø d	L	h2	h1	TOP FLANGE DIMENSIONS				O	WT(Kg)
							øN	øP	m	øS		
1 1/2	40	86	40	40	122	54	90	70	4	9	10	3.1
2	50	105	52	43	129	57	90	70	4	9	11	3.7
2 1/2	65	114	65	46	139	67	90	70	4	9	11	4
3	80	129	80	46	156	78	90	70	4	9	11	4.7
4	100	155	100	52	164	100	90	70	4	9	11	5.9
5	125	180	125	56	187	107	90	70	4	9	12	8.9
6	150	207	150	56	200	122	90	70	4	9	12	9.8
8	200	260	198	60	238	160	125	102	4	12	13	11
10	250	331	248	68	383	215	125	102	4	12	15	20
12	300	377	298	78	316	245	125	102	4	12	15	31.5

SIZE		ANSI 150 Lb			JIS 5K			JIS 10K			JIS 16K(20K)			BS4504 PN10			BS4504 PN16		
NPS	DN	ØC	F	ØE	ØC	F	ØE	ØC	F	ØE	ØC	F	ØE	ØC	F	ØE	ØC	F	ØE
1 1/2	40	98.5	4	16	95	4	15	105	4	19	105	4	19	110	4	18	110	4	18
2	50	120.5	4	19	105	4	15	120	4	19	120	8	19	125	4	18	125	4	18
2 1/2	65	139.5	4	19	130	4	15	140	4	19	140	8	19	145	8	18	145	4	18
3	80	152.5	4	19	145	4	19	150	8	19	160	8	23	160	8	18	160	8	18
4	100	190.5	8	19	165	8	19	175	8	19	185	8	23	180	8	18	180	8	18
5	125	216	8	22	200	8	19	210	8	23	225	8	25	210	8	18	210	8	18
6	150	241.5	8	22	230	8	19	240	8	23	260	12	25	240	8	18	240	8	23
8	200	298.5	8	22	280	8	23	290	12	23	305	12	25	295	8	23	295	12	23
10	250	362	12	25	345	12	23	355	12	23	380	12	27	350	12	23	355	12	27
12	300	432	12	25	390	12	23	400	16	25	430	16	27	400	12	23	410	12	27

(1) This standard covers design Category "A" concentric disc.

1. LEVER OPERATOR FOR BUTTERFLY VALVE

General Characteristic	The butterfly valve to be open & closed with intermediate lock position by a quarter turn lever for the nominal diameter below 150A
Features	Quarter turn action, self locks 10to 10° position notch plate at 10° intervals Handle indicates valve position can mounted in any 90° quadrant

2. GEAR OPERATOR FOR BUTTERFLY VALVE

General Characteristic	The butterfly valve to be operated by worm gear operated manual handle. The position of worm gear with indicator on the top shall be provided with pipe line parallel in principle, however any location is available with reduction rate.
Use	General purpose manual operator for ON/Off or throttling duties.
Features	Heavy duty, weather proof type.
Options	Limits switch, Chain-wheel, Locking device, Hand-wheel extension shafts.

ASTM No. as per Materials and Products.

Nominal designation	Grade Trademark	Temperatu re	ASTM			
			FORGING	CASTING	PLATES	BAR
IRON						
Gray Cast Iron	C:3.2-3.8/Si:1.4-2.5/ Mn:0.5-1.4/ P:0.3-0.8/S:0.06	≤200		A126		
Ductile iron		≤300		A395		
CARBON STEEL						
WCA	-		A105	A216-WCA	-	
WCB	C-Si	-30-425	A105	A216-WCB	A515-70	A105
WCC	C-Mn-Si		-	A216-WCC	-	
ALLOY STEEL FOR HIGH TEMPERATURE						
WC1	Carbon-1/2MO		A182-F1	A217-WC1	A204-A	A182-F1
WC6	1 1/4Cr-1/2Mo	-30-593	A182-F11	A217-WC6		A739-B11
WC9	2 1/4Cr-1Mo	-30-593	A182-F22	A217-WC9		A739-B22
C5	5Cr-1/2Mo	-30-649	A182-F5,F5a	A217-C5		
C12	9Cr-1Mo	-30-649	A182-F9	A217-C12		
C12A	-		A182-F91	A217-C12A		
13Cr	13Cr-Type410	-30-704	A182-F6,F6a	A217CA15		
ALLOY STEEL FOR LOW TEMPERATURE						
LCB	C-Si	-46-340	A350-LF1	A352-LCB	A515-65	A696-C
LCC	C-Mn-Si		A350-LF2	A352-LCC	A515-70	A350-LF2
-LC1	C-1/2Mo		-	A352-LC1	A204-B	-
LC2	2 1/2Ni		-	A352-LC2	A203-B	-
LC3	3 1/2Ni	-101-340	A350-LF3	A352-LC3	A203-E	A350-LF3
STAINLESS STEEL						
304L	18Cr-8Ni-lOc	425~	A182-F304L	A351-CF3		A479-304L
304	18Cr-8Ni	-268-649	A182-F304	A351-CF8		A479-304
316L	18Cr-8Ni-2Mo-LoC	~454	A182-F316L	A351-CF3M		A479-316L
316	18Cr-8Ni-2Mo	-268-648	A182-F316	A351-CF8M		A479-316
316LN	18Cr-12Ni-2.5Mo-0.15N-LoC		A182-F316LN	A351-CF3MN		A479-316LN
347	18Cr-9Ni-Cb-0.06C	-268-648	A182-F347	A351-CF8C		A479-347
304H	18Cr-8Ni-0.07C		A182-F304H	A351-CF10		A479-304H
316H	18Cr-12Ni-2.5Mo-0.07C		A182-F316H	A351-CF10M		A479-316H
309S	22Cr-12Ni-0.06C		A182-F309S	A351-CH8		A479-309S
309H	22Cr-12Ni-0.07C		A182-F309H	A351-CH10		A479-309H
309	22Cr-12Ni-0.07C		A182-F309	A351-CH20		A479-309
310	22Cr-12Ni-0.1C		A182-F310	A351-CK20		A479-310

ASTM No. as per Materials and Products.

Nominal designation	Grade Trademark	Temperatu re	ASTM			
			FORGING	CASTING	PLATES	BAR
STAINLESS STEEL						
316Cb	18Cr-13Ni-2Mo-Cb-0.06C		A182-F316Cb	A351-CF10MC		A479-316Cb
XM-19	22Cr-12Ni-5Mn-2Mo-Cb-V-N-0.04C		A182-XM-19	A351-CG6MMN		A479-XM-19
317	18Cr-12Ni-3.5Mo-0.06L		A182-F317	A351-CG8M		A479-317
CK3MCuN	20Cr-18Ni-6.5Mo-N-Cu-0.01C		-	A351-CK3MCuN		-
317L	18Cr-12Ni-3.5Mo-LoC		A182-F317L	A351-CG3M		A479-317L
DUPLEX STAINLESS STEEL						
1A	25Cr-5Ni-Mo-Cu	-50~200	-	A890-CD4MCu		A479
1B	25Cr-5Ni-Mo-Cu-N	-50~200	-	A890-CD4MCuN		A479
1C	25Cr-6Ni-Mo-Cu-N	-50~200	-	A890-CD3MCuN		A479
2A	24Cr-10Ni-Mo-N	-50~200	-	A890-CE8MN		-
3A	25Cr-5Ni-Mo-N	-50~200	-	A890-CD6MN		-
4A(2205)	22Cr-5Ni-Mo-N(2205)	-50~200	A182-F51	A890-CD3MN		A479
5A(SAF2507)	25Cr-7Ni-Mo-N(2507)	-50~200	A182-F53	A890-CE3MN		A479
6A	25Cr-7Ni-Mo-N(Zeron100)	-50~200	A182-F55	A890-CD3MWCuN		A479
SPECIAL ALLOY						
ALLOY 20	Carpenter 20Cb3	~425	B462	A351-CN7M		B473
ALLOY 200	-		B316	A494-CZ-100		B160
ALLOY 400	Monel 400	~400	B564	A494-M35-1		B164
M35-2	-		-	A494-M35-2		-
ALLOY B	Hastelloy-B	~649	B564	A494-N7M		B335
ALLOY C	Hastelloy-C (276)		B564	A494-CW12MW		B574
ALLOY 600	Inconel 600		B564	A494-CY40		B166
ALLOY 625	Inconel 625	~649	B564	A494-CW6MC		B446
ALLOY 800	Inconel 800		B564	-		B408
ALLOY 825	Inconel 825		B425	A494-Cu5MCuC		B425

API Trim Number

API TRIM No.	Nominal Trim	Trim Code	Body Seat	Disc & Wedge	Stem Materials
1	13Cr	F6	13Cr	13Cr	A479-410
2	18Cr-8Ni	304	304	304	A479-304
3	25Cr-20Ni	310	310	310	A479-310
4	Hard 13Cr	F6H	Hard 13Cr	Hard 13Cr	A479-410
5	HF	F6HF	HF	HF	A479-410
5a	HF	F6HF	HF	HF	A479-410
6	13Cr or Cu-Ni	F6HFS	13Cr	13Cr	A479-410
7	13Cr Hard 13Cr	F6HF+	Hard 13Cr	Hard 13Cr	A479-410
8	13Cr HF	F6HFS	HF	HF	A479-410
8a	13Cr HF	F6HFS	HF	HF	A479-410
9	Ni-Cu alloy	MONEL	Monel	Monel	B164-NO4400
10	18Cr-8Ni-Mo	316	316	316	A479-316
11 & 11a	Ni-Cu alloy HF	Monel HFS	HF	HF	B164-NO4400
12 & 12a	316 and HF	316 HFS	HF	HF	A479-316
13	19Cr-29Ni	Alloy 20	Alloy 20	Alloy 20	B473-NO8020
14	19Cr-29Ni-HF	Alloy 20 HFS	HF	HF	B473-NO8020
15	HF	304 HS	HF	HF	A479-304
16	HF	316 HF	HF	HF	A479-316
17	HF	347 HF	HF	HF	A479-347
18	HF	Alloy 20 HF	HF	HF	B473-NO8020
19	Nicker				
19a	Alloy 625				
19b	Alloy C276				
19c	Alloy 825				
20	Nicker & HF				

NOTE: 1) HF = Hardfacing using CoCr or NiCr welding alloy, The suffix A applied to NiCr
2) Free machining grades of 13Cr shall not be used.

Comparison table for Bolting materials.

ASTM BODY MATERIALS	Applying BOLT Materials			Applying NUT Materials			Service TEMP. Bt. & Nt.
	ASTM	DIN	BS	ASTM	DIN	BS	
HIGH TEMPERATURE							
A216-WCB	A193-B7	17200-42CrMo4	1506-621A	A192-2H	17240-C45	1506-162	550°C
A217-WC1							
A217-WC6							
A217-WC9	A193-B16	17240-24CrMoV5 5	1506-661	A194-4	17240-24CrMo5	1506-240	600°C
A217-C5							
A217-C12							
A217-C12A							
A351-CF3	A193-B8	17440-X5CrNi18 9	1506-801 B	A194-8	17440-X5CrNi18 9	1506-801B	800°C
A351-CF8							
A351-CF8C							
A351-CK20							
A351-CF3M	A193-B8M	17440-X5CrNiMo 18 10	1506-845	A194-8M	17440-X5CrNiMo 18 10	1506-845	800°C
A351-CF8M							
A351-CG8M							
A351-CF8C	A193-B8T	17440-X10CrNiTi18 9	1506-821Ti	A194-8T	17440-X10CrNiTi18 9	1506-821Ti	800°C
A351-CF8C	A193-B8C	17440-X10CrNiNb18 9	1506-821Nb	A194-8C	17440-X10CrNiNb18 9	1506-821Nb	800°C
LOW TEMPERATURE							
A352-LCB	A320-L7	17200-42CrMo4	1506-621A	A194-4	17240-24CrMo5	1506-240	-101°C
A352-LCC							
A351-CF3	A320-B8	17440-X5CrNi18 9	1506-801B	A194-8	17440-X5CrNi18 9	1506-801B	-196°C
A351-CF8							
A351-CF8C							
A351-CK20							
A351-CF3M	A320-B8M	17440-X5CrNiMo 18 10	1506-845	A194-8M	17440-X5CrNiMo 18 10	1506-845	-196°C
A351-CF8M							
A351-CG8M							
A351-CF8C	A320-B8T	17440-X10CrNiTi18 9	1506-821Ti	A194-8T	17440-X10CrNiTi18 9	1506-821Ti	-196°C
A351-CF8C	A320-B8C	17440-X10CrNiNb18 9	1506-821Nb	A194-8C	17440-X10CrNiNb18 9	1506-821Nb	-196°C



Torque data List

Gate Valve

SIZE		1-1/2"	2"	2-1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
150 Light Wall	Kgf-m	0.7	1.1	1.2	1.8	2.8	5.1	8.8	13.5	19.7	30.5	40	52.7	67.9	109.3
	N-m	6.9	10.8	11.8	17.6	27.4	50	86.2	132.3	193.1	298.9	392	516.5	665.4	1071.1
	Lb-m	5.1	8	8.7	13	20.3	36.9	63.7	97.7	142.5	220.6	289.3	381.2	491.1	790.6
150 Heavy Wall	Kgf-m	1.2	1.6	1.7	2.4	3.6	7.1	11	16.4	24.7	31.3	41.6	54.1	73.6	117.6
	N-m	11.8	15.7	16.7	23.5	35.3	69.6	107.8	160.7	242.1	306.7	407.7	530.2	721.3	1152.5
	Lb-m	8.7	11.6	12.3	17.4	26	51.4	79.6	118.6	178.7	226.4	300.9	391.3	532.4	850.6
300	Kgf-m	1.9	2.2	2.5	3.7	6	14	23.6	38.1	55.7	70.9	94.2	127.9	167.2	281.2
	N-m	18.6	21.6	24.5	36.3	58.8	137.2	231.3	373.4	545.9	694.8	923.2	1253.4	1638.6	2755.8
	Lb-m	13.7	15.9	18.1	26.8	43.4	101.3	170.7	275.6	402.9	512.8	681.4	925.1	1209.4	2033.9
600	Kgf-m	-	3.2	4.9	7.1	12.5	32.3	52.2	85.6	124.4	171.3	227.3	290.3	382.5	711.3
	N-m	-	31.4	48	69.6	122.5	316.5	511.6	838.9	1219.1	1678.7	2227.5	2844.9	3748.5	3970.7
	Lb-m	-	23.2	35.4	51.4	90.4	233.6	377.6	619.1	899.8	1239	1644.1	2099.7	2766.6	5144.8
900	Kgf-m	-	-	-	11.7	18.7	46.4	80.2	136.9	196.7	244.1	357.4	499	738.7	1158
	N-m	-	-	-	114.7	183.3	454.7	786	1341.6	1927.7	2392.2	3502.5	4890.2	7239.3	11348.4
	Lb-m	-	-	-	84.6	135.3	335.6	580.1	990.2	1422.7	1765.6	2586.1	3609.3	5343	8375.8
1500	Kgf-m	-	7.8	12.1	17.3	27.5	66.7	131	229.4	334.6	447.7	639.3	906.2	1257	2121
	N-m	-	76.4	118.6	169.5	269.5	653.7	1283.8	2248.1	3279.1	4387.9	6265.1	8880.8	12318.6	20785.8
	Lb-m	-	56.4	87.5	125.1	198.9	482.4	947.5	1659.3	2420.2	3238.5	4624.1	6554.5	9091.9	15341.2

Globe Valve

SIZE		1-1/2"	2"	2-1/2"	3"	4"	6"	8"	10"	12"
150	Kgf-m	1.4	1.6	2.4	3.6	6.2	12.2	21.3	32.4	45.3
	N-m	13.7	15.7	23.5	35.3	60.8	119.6	208.7	317.5	443.9
	Lb-m	10.1	11.6	17.4	26	44.8	88.2	154.1	234.4	327.7
300	Kgf-m	19.1	19.1	22.2	25.4	28.6	34.9	41.3	44.5	47.6
	N-m	187.2	187.2	217.6	248.9	280.3	342	404.7	436.1	466.5
	Lb-m	138.2	138.2	160.6	183.7	206.9	252.4	298.7	321.9	344.3
600	Kgf-m	-	25.4	28.6	31.8	38.1	50.8	57.2	57.2	57.2
	N-m	-	248.9	280.3	311.6	373.4	497.8	560.6	560.6	560.6
	Lb-m	-	183.7	206.9	230	275.6	367.4	413.7	413.7	413.7
900	Kgf-m	-	28.6	31.8	34.9	38.1	50.8	57.2	-	-
	N-m	-	280.3	311.6	342	373.4	497.8	560.6	-	-
	Lb-m	-	206.9	230	252.4	275.6	367.4	57.2	-	-
1500	Kgf-m	-	28.6	31.8	34.9	38.1	50.8	57.2	-	-
	N-m	-	280.3	311.6	342	373.4	497.8	560.6	-	-
	Lb-m	-	206.9	230	252.4	275.6	367.4	57.2	-	-



Torque data List

Ball Valve (Full Bore)

SIZE		1-1/2"	2"	2-1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
150 Floating	Kgf-m	3.2	4.6	8.7	15.6	23.8	71.2	126.3	167.2	282.4	-	-	-	-	-
	N-m	31.4	45.1	85.3	152.9	233.2	697.8	1237.7	1638.6	2767.5	-	-	-	-	-
	Lb-m	23.2	33.3	62.9	112.8	172.2	515	913.5	1209.4	2042.6	-	-	-	-	-
150 Trunnion Mounted	Kgf-m	-	-	-	-	-	39.9	94.5	166.3	176.2	193.4	223.4	253.4	287.6	378.2
	N-m	-	-	-	-	-	391	926.1	1629.7	1726.8	1895.3	2189.3	2483.3	2818.5	3706.4
	Lb-m	-	-	-	-	-	288.6	683.5	1202.9	1274.5	1398.9	1615.9	1832.8	2080.2	2735.5
300 Floating	Kgf-m	3.6	5.2	11.6	21.3	35.2	111.4	223.4	-	-	-	-	-	-	-
	N-m	35.3	51	113.7	208.7	345	1091.7	2189.3	-	-	-	-	-	-	-
	Lb-m	26	37.6	83.9	154.1	264.6	805.8	1615.9	-	-	-	-	-	-	-
300 Trunnion Mounted	Kgf-m	-	-	-	-	-	-	121.3	174.3	195.2	282.7	332.4	433.5	493.2	702.6
	N-m	-	-	-	-	-	-	1188.7	1708.1	1913	2770.5	3257.5	4248.3	4833.4	6885.5
	Lb-m	-	-	-	-	-	-	877.4	1260.7	1411.9	2044.8	2404.3	3135.5	3567.3	5081.9
600 Floating	Kgf-m	-	11.7	27.6	34.1	47.9	102	-	-	-	-	-	-	-	-
	N-m	-	114.7	270.5	334.2	469.4	999.6	-	-	-	-	-	-	-	-
	Lb-m	-	84.6	199.6	246.7	346.5	737.8	-	-	-	-	-	-	-	-
600 Trunnion Mounted	Kgf-m	-	-	-	-	-	-	157.3	208.7	253.2	456.7	678.5	902.4	1183	1895
	N-m	-	-	-	-	-	-	1541.5	2045.3	2481.4	4475.7	6649.3	8843.5	11593.4	18571
	Lb-m	-	-	-	-	-	-	1137.8	1509.5	1831.4	3303.3	4907.6	6527.1	8556.6	13706.5

Ball Valve (Reduced Bore)

SIZE		1-1/2"	2"	2-1/2"	3"	4"	6"	8"	10"	12"
150 Floating	Kgf-m	2.3	3.4	5.2	8.7	15.7	34.8	71.6	125.6	194.3
	N-m	25.5	33.3	51	85.3	153.9	341	701.7	1230.9	1904.1
	Lb-m	18.8	24.6	37.6	62.9	113.6	251.7	517.9	908.5	1405.4
300 Floating	Kgf-m	2.7	3.8	5.2	10.7	21.6	56.4	111.3	222.5	-
	N-m	26.5	37.2	51	104.9	211.7	552.7	1090.7	2180.5	-
	Lb-m	19.5	27.5	37.6	77.4	156.2	407.9	805	1609.3	-

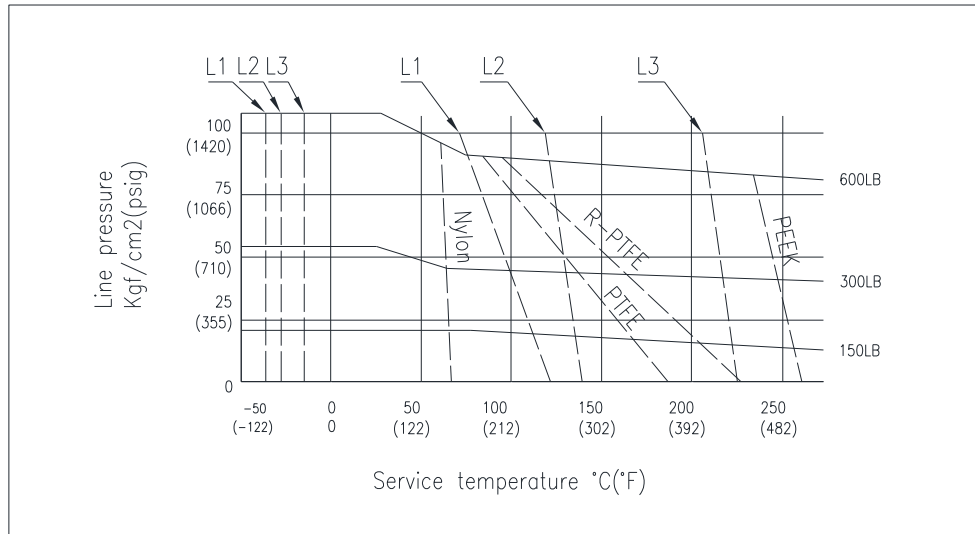
Pressure temperature rating for seat material of ball valves.

CLASS 150, 300, 600 SEALING UPPER LIMITS

H1 : NBR / BUNA-N

H2: EPDM Epichlorohydrin copolymer

H3: Viton

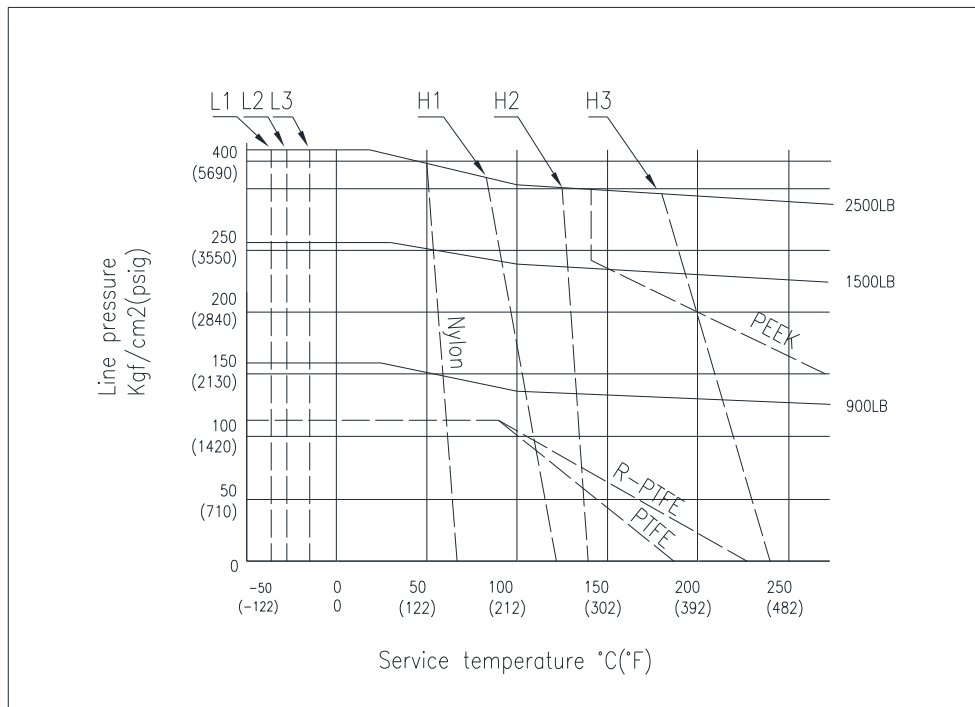


CLASS 9.., 1500, 2500 SEALING LOWER LIMITS

L1 : NBR / BUNA-N

L2: Viton

L3: Low-temperature NBR



APPLICABLE STANDARDS

TSC valves conform to following standards applicable to customer requirements.

1. American Standards

API	6D	: API Specification for Pipeline Valves
	598	: Valve Inspection and test
	600	: Steel Gate Valves, Flanged and Butt-welding Ends
	607	: Fire type-testing requirement
	602	: Compact steel Gate Valves-Flanged, Threaded, Welding, and Extended-Body Ends
	603	: Corrosion-Resistant Flanged-End Gate Valves

ASME	B16.5	: Pipe Flanges and Flanged fittings
	B16.10	: Face to Face and end to end dimension of valves.
	B16.25	: Butt weld ends.
	B16.34	: Valves flanged, thread and weld ends.
	B16.47	: Large diameter steel flanges.
	B31.3	: Chemical plant and petroleum refinery piping
	B31.8	: Gas transmission and distribution system.

MSS	SP-6	: Standard finishes for contact of pipe flanged and connecting end flanged of valves.
	SP-25	: Standard marking system for valves, fitting, flanges and unions.
	SP-44	: Steel pipeline flanges.
	SP-45	: By-Pass and drain connection Standard
	SP-72	: Ball valves with flange or butt weld ends for general service.
	SP-61	: Pressure testing of steel valves.
	SP-82	: Valves pressure testing method.

2. International Standards

ISO 9001	: Quality system model of quality assurance in design, development, production, installation and servicing.
ISO 5211	: Part-turn valves actuator attachment.
ISO 7121	: Flanged steel ball valves.
EN 10204	: Type of inspection documents
NACE-MR-01-75	: Sulfide stress cracking resistant materials.

APPLICABLE STANDARDS

TSC valves conform to following standards applicable to customer requirements.

3. British Standards

BS 1560	: Circular flanges for pipes, flange and fittings.
BS 2080	: Face to face, center-to-center, end-to-end and center-to-end dimensions of valves.
BS 5146	: Inspection and test of valves.
BS 5351	: Steel ball valves for the petroleum, petrochemical and allied instrument.
BS 6755 Pt2.	: Testing of valves, Specification for fire-type testing requirements.

4. German Standards

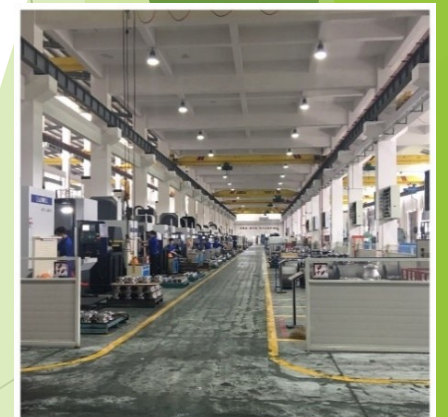
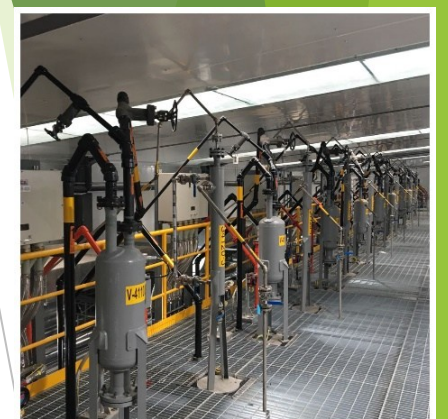
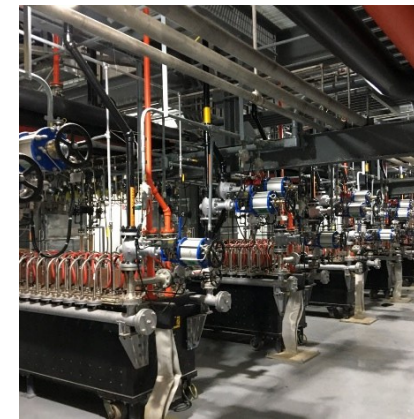
DIN 1690	: Technical delivery conditions for casting of metallic materials.
DIN 2505	: Calculation of flange joints.
DIN 2544-48	: Cast steel flanges.
DIN 2526	: Finishing of flange packing surface.
DIN 3203	: Face-to-face dimension of flange valves.
DIN 3230	: Bodies of valves, calculation.

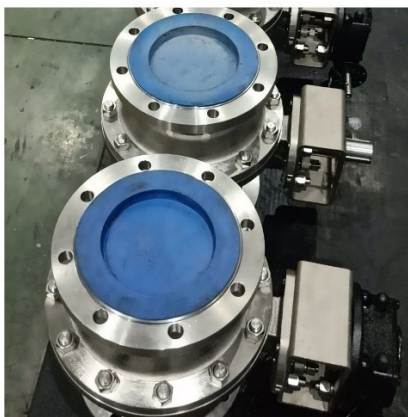
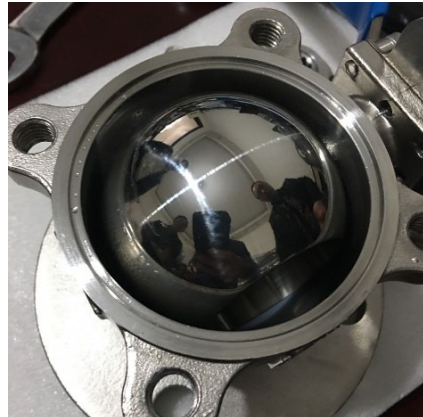
5. JIS & KS Standards

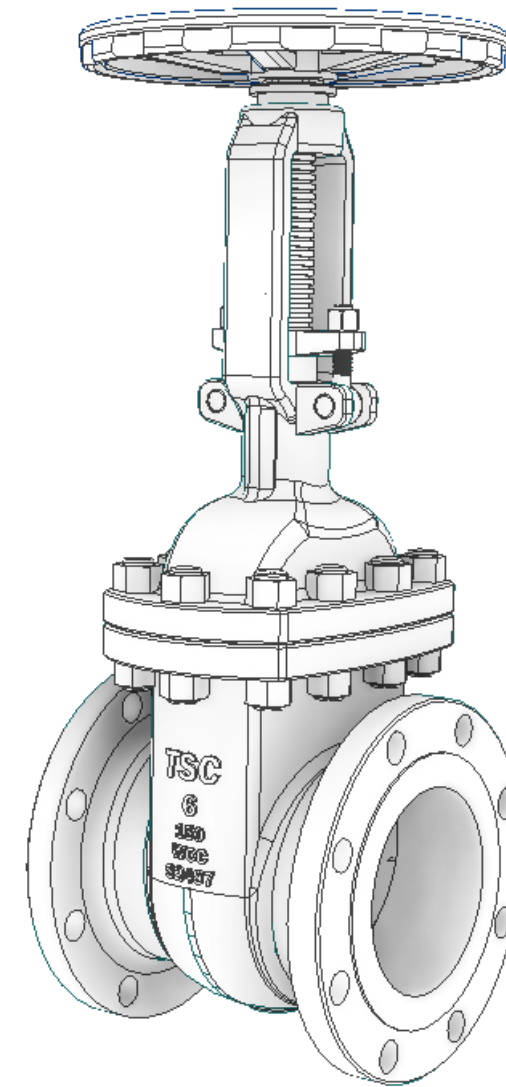
JIS B 2002	: Face to face and end to end dimension of valve.
JIS B 2003	: General rules for inspection of valves.
JIS B 2220	: Steel welding pipe flanges.
KS B 2304	: Ball valve.
KS B 2308	: Korea standard flanged ball valves.

6. translation of abbreviations

API	: American Petroleum Institute
ANSI	: American National standards Institute
ASTM	: American Society for testing and Materials
ASME	: American Society of Mechanical Engineers
MSS	: Manufacturers standardization Society of the valve and fitting Industry
BS	: British standards Institute
JIS	: Japanese Industrial standards
JPI	: Japan Petroleum Institute
NACE	: National association of Corrosion Engineers
AWS	: American welding society







Thank you

Qingdao

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