AUTHORIZED COMPANY

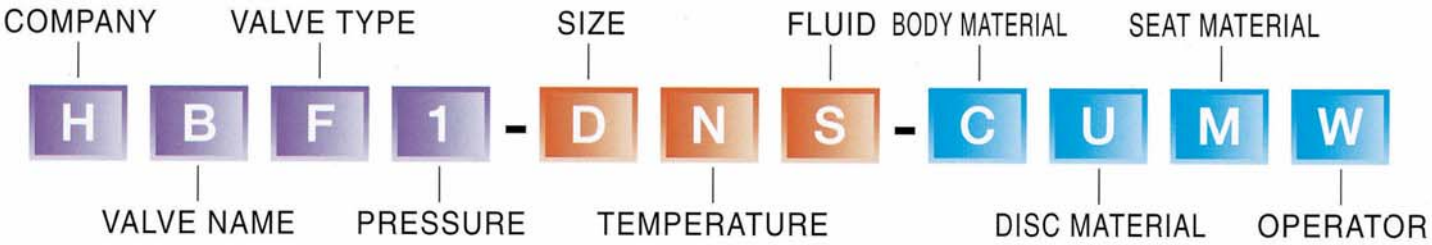
TÜV CERT ISO9001 | API6D | TÜV CE0035

CASTING VALVE

GATE VALVE • GLOBE VALVE • SWICH • BALL • PLUG • VALVE

CARBON & ALLOY STEEL STAINLESS STEEL VALVE

Hawks Eng'r Co., Ltd.



H-COMPANY
HAWKS Co., Ltd.

B-VALVE NAME
B/Butterfly, GA/Gate, GL/Globe, BA/Ball, CH/Check.

F-VALVE TYPE
F/Flange, L/Lugged, W/Wafer, B/Butt Weld, S/Special

1-PRESSURE
1/10k(150#), 2/20k(300#), 3/30k(450#), 4/40k(600#), 6/60k(900#), 9/90k(1500#), etc...

D-SIZE
Standard -- 2"~24"
A/2", B/2.5",C/3", D/4", E/5", F/6", G/8", H/10", J/12", K/14", L/16", M/18", N/20", O/24", P/28", Q/32", R/36", S/40", T/44", U/48". etc ... Others is a marking of additionally dependable by the buyer.

N-TEMPERATURE
1/100℃, 2/200℃, 3/300℃, 5/500℃ , 7/700℃, 9/900℃
N/20 (normal temp')
Low temp is a marking of additionally dependable by the buyer.

S-FLUID
S/Steam, W/Water, O/Oil, G/Gas, B/Brine,C/Chemical

C-BODY MATERIAL
D : CARBON STEEL
E : HIGH TEMP ALLOY STEEL
F : LOW TEMP ALLOY STEEL
S : STAINLEN STEEL
Others is a marking of additionally dependable by the buyer.

DISC MATERIAL
S : 304, 316SS
F : A217-CA15
W : A216-WCB
Others is a marking of additionally dependable by the buyer.

SEAT MATERIAL
M : 304SS, 316SS
H : HF STELLITE
F : FULL STELLITE
Others is a marking of additionally dependable by the buyer.

W-OPERATOR
L/Hand wheel
W/Worm gear
P/Pneumatic actuator
H/Hydraulic actuator
E/Electric actuator

CAST STEEL GATE VALVES

BOLTED BONNET

YOKE SLEEVE

The upper portion of the Yoke Sleeve is hexagonally tapered to fix the handwheel. The standard material of the Yoke Sleeve is Nodular Ni-resist D2 with over 1150°C(2100°F) dissolution point in accordance with API Std. specifications.

BOLTING

The body-bonnet bolts are manufactured in accordance with API Std. 600 specifications. The nuts also strictly conform with ANSI B1.1 The stud-bolt nuts, hexagonal, rigid and hot-forged, bear material notation as well as do the bolt nuts made according to ANSI B18.2.2

BONNET

The bonnet and valve body have the same wall thickness.
The body-bonnet flange drilling is spot-faced to exactly meet stud-bolt nuts. The bonnet back seat bushing guarantees packing replacement even when the valve is fully opened. The stem packing dimensions of the stuffing box are in accordance with API specifications.

STEM

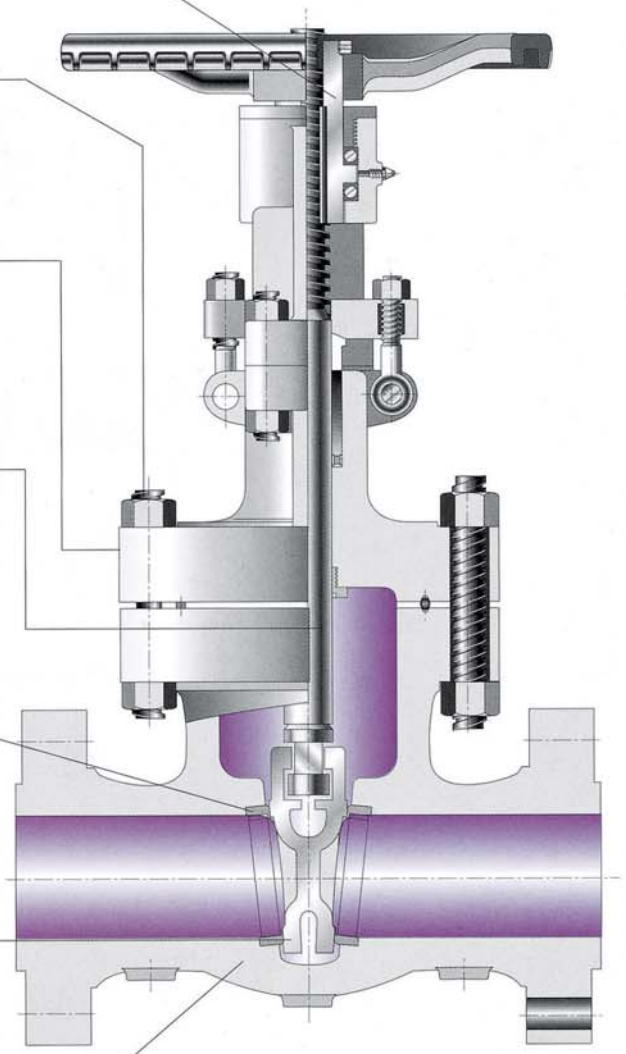
The machined forged stem comes with a T-shape head, which connects the slot of the wedge. The Spherically shaped contacting surface of the head gives greater strength and durability.
The stem dimensions are in accordance with API Std. 600 Specifications.
The heat treated stem delivers adequate mechanical properties as well as excellent surface haredness. Further, opening/shutting friction is minimized by accurate machining and lapping.

SEAT RING

Bottom seated type seat rings are welded or screwed into the body.
The seating surface is finished by lapping. They are forgings that have been heat treated to delived the best mechanical properties and required hardness. The difference in hardness between seats and wedge is in accordance with API specifications.

FLEXIBLE WEDGE

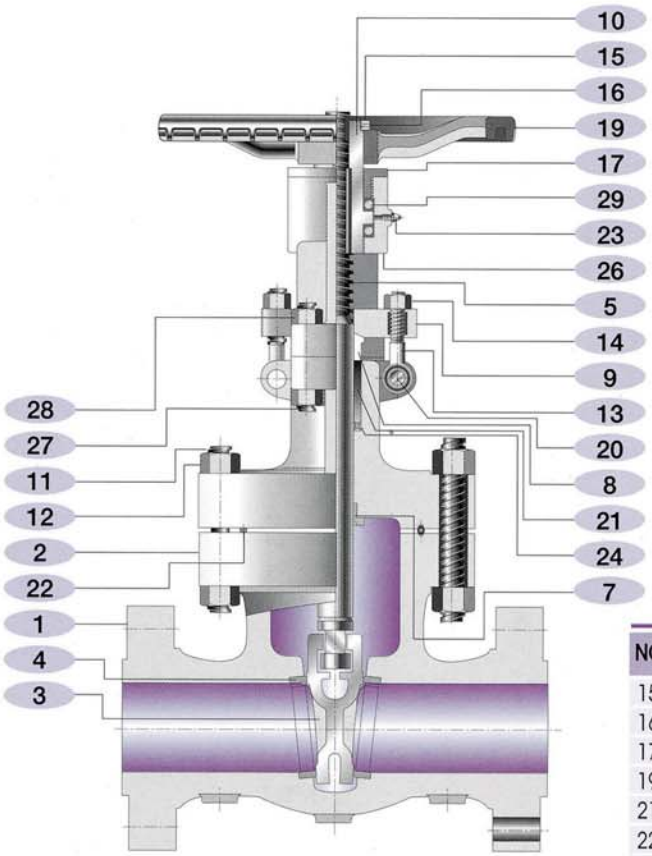
The standard disc of our valves is a one-piece flexible wedge.
Slots are machined on both sides of the wedge to allow it to travel correctly in the integrally cast body guides.
The wedge seating surfaces have been accurately machined, grind and lapped to a mirror finish to prevent leakage and eliminate galling.



BODY

The cast steel body is designed to insure a wall thickness which is greater at any point than the minimum specified by API Std. 600. Special care has been taken with the design of the Class 150 valve body so that the elliptically shaped center section is free from intensified stresses in the critical area.
The body of above Class 300 are made circular in shape as much as possible to minimize distortion even under extreme operationg conditions. Inlet and outlet port dimensions conform with ANSI B16.5 Pipe Fitting.
The welded-in type seat ring is standard to insure interchangeabillity. Except for Class 150, the standard body-bonnet joint is male and female.

CAST STEEL
BOLTED BONNET



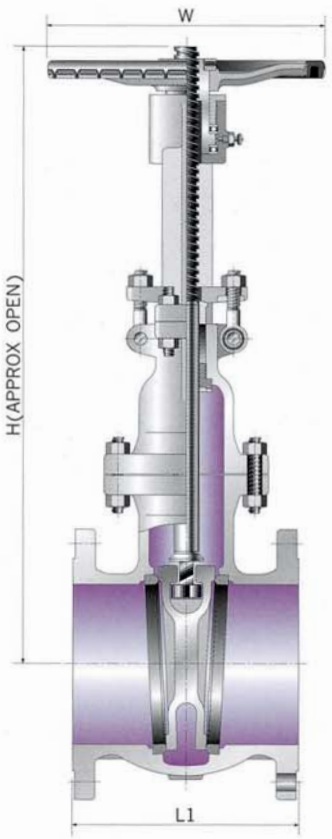
NO	NAME OF PART	ASTM SPECIFICATION	KS SPECIFICATION
15	HANDLE NUT	STEEL	STEEL
16	SET SCREW	STEEL	STEEL
17	SLEEVE GLAND	STEEL	STEEL
19	HANDWHEEL	A395	FCD45
21	PACKING	COMMERCIAL	COMMERCIAL
22	GASKET	COMMERCIAL	COMMERCIAL
23	GREASE NIPPLE	STEEL	STEEL
29	BEARING	COMMERCIAL	COMMERCIAL

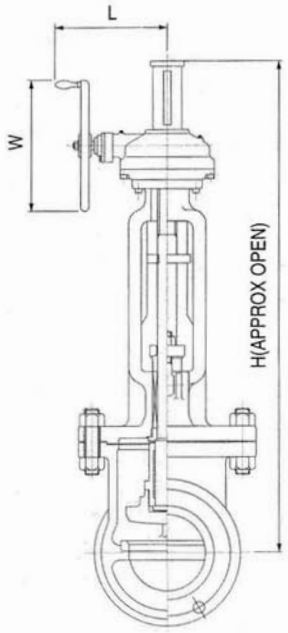
NO	NAME OF PART	ASTM SPECIFICATION						KS SPECIFICATION
		STANDARD	HIGH TEMPERATURE SERVICE				LOW TEMPERATURE SERVICE	STANDARD
1	BODY	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	SCPH 2
2	BONNET	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	SCPH 2
3	*DISC	A217-CA15	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	SSC 1
4	BODY SEAT RING	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A182-F304	STEEL + 13CR
5	STEM	A182-F6a	A182-F6a	A182-F6a	A182-F6a	A182-F6a	A276-304	STS 410
7	BONNET BUSH	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	STS 410
8	PACKING GLAND	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	STS 410
9	GLAND FLANGE	A105	A105	A105	A105	A105	A105	SF 45
10	YOKE SLEEVE	A439-D2C	A439-D2C	A439-D2C	A439-D2C	A439-D2C	A439-D2C	FCD 45
11	BONNET BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A320-L7	SNB 7
12	BONNET NUT	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-4	SM 45C
13	GLAND BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A320-L7	SM 45C
14	GLAND NUT	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-4	SM 45C
20	HINGE PIN	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	SM 45C
24	LANTERN	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	STS 410
26	YOKE	A216-WCB	A216-WC1	A216-WC6	A216-WC9	A216-C5	A352-LCB	SCPH 2
27	YOKE BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A320-L7	SNB 7
28	YOKE NUT	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-4	SM 45C

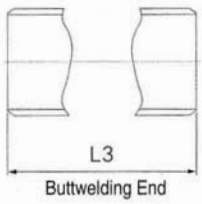
*Note : In case of 8" and larger size, we'll use trim material overlayed one on the same or equivalent material of the Body.

GT KS 10K / ASME 150LB

BOLTED BONNET



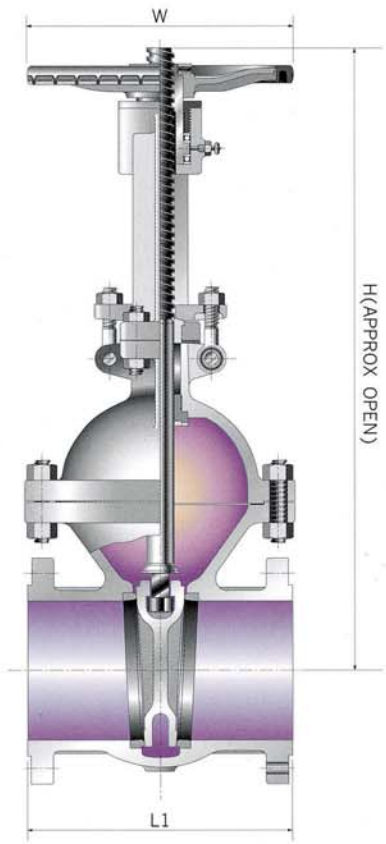


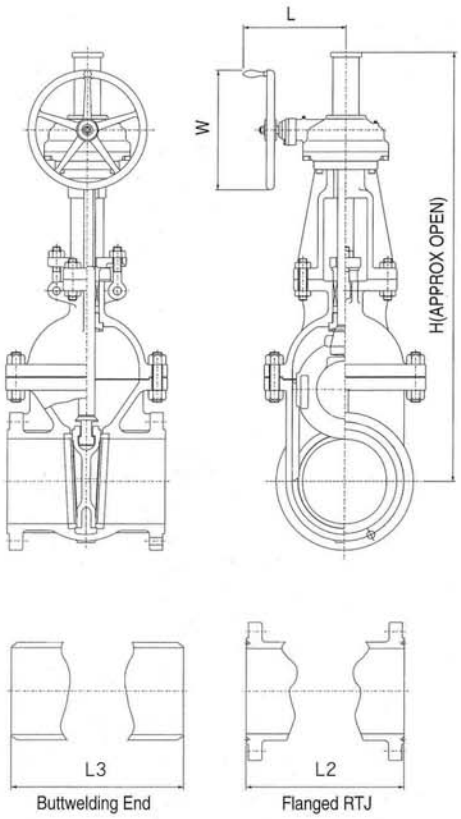


VALVE SIZE	in	2	2.5	3	4	6	8	10	12	14	16	18	20	24	28	30	36	40
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600	700	750	900	1000
L1	in	7.0	7.5	8.0	9.0	10.5	11.5	13.0	14.0	15.0	16.0	17.0	18.0	20.0	24.0	24.0	28.0	30.0
	mm	178	190	203	229	267	292	330	356	381	406	432	457	508	610	610	711	762
L3	in	8.5	9.5	11.12	12.0	15.87	16.5	18.0	19.75	22.5	24.0	26.0	28.0	32.0	36.0	36.0	40.0	42.0
	mm	216	241	283	305	403	419	457	502	572	610	660	711	813	914	914	1016	1067
H	in	14.0	16.3	18.4	22.2	30.0	41.9	50.6	58.3	60.0	68.7	79.1	91.7	109.6	127.4	134.5	161.8	183.9
	mm	356	415	468	565	762	1065	1285	1480	1523	1745	2010	2330	2784	3236	3417	4109	4670
W	in	7.7	7.7	8.5	9.4	11.8	14.0	15.7	17.7	13.8	13.8	13.8	17.7	17.7	22.0	22.0	27.9	31.5
	mm	195	195	215	240	300	355	400	450	350	350	350	450	450	560	560	710	800
L	in	–	–	–	–	–	–	–	–	13.1	13.1	13.1	14.3	14.3	16.3	16.3	18.4	20.7
	mm	–	–	–	–	–	–	–	–	332	332	332	362	362	414	414	468	526
WEIGHT	LB	44.1	55.1	66.2	97.0	154.4	233.7	368.2	526.9	760.7	1080.5	1274.5	1611.9	2280.0	3572.1	4057.2	7497.0	9481.5
	Kg	20	25	30	44	70	106	167	239	345	490	578	731	1034	1620	1840	3400	4300

GT KS 20K / ASME 300LB

BOLTED BONNET

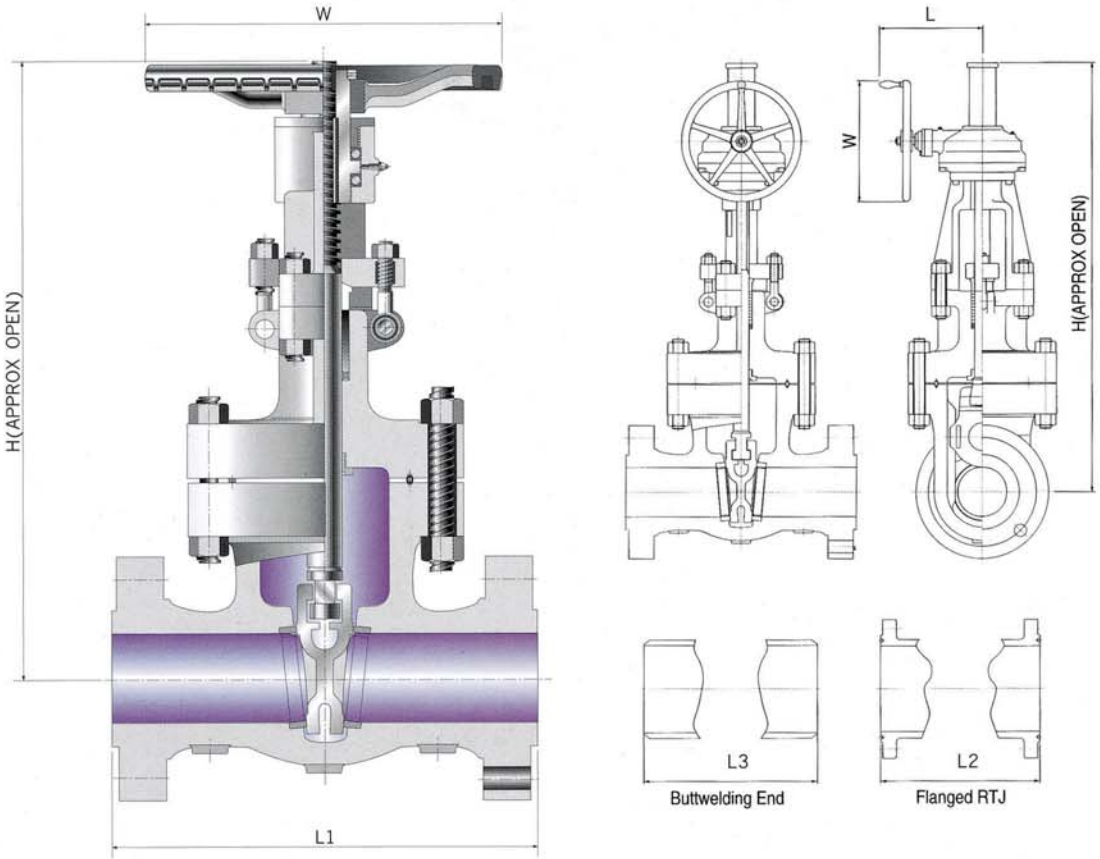




VALVE SIZE	in	2	2.5	3	4	6	8	10	12	14	16	18	20	24	28	30	36	40	42
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600	700	750	900	1000	1050
L1 &L3	in	8.5	9.5	11.12	12.0	15.88	16.5	18.0	19.75	30.0	33.0	36.0	39.0	45.0	53.0	55.0	68.0	76.0	78.0
	mm	216	241	283	305	403	419	457	502	762	838	914	991	1143	1346	1397	1727	1930	1981
L 2	in	9.12	10.12	11.75	12.62	16.5	17.12	18.62	20.37	30.62	33.62	36.62	39.75	45.88	54.0	56.0	69.12	–	–
	mm	232	257	298	321	419	435	473	518	778	854	930	1010	1165	1372	1422	1756	–	–
H	in	16.3	17.5	20.5	23.2	33.3	40.4	48.2	61.4	60.0	68.7	79.1	91.7	109.6	130.0	148.5	169.8	188.6	198.1
	mm	415	445	520	590	845	1025	1225	1560	1523	1745	2010	2330	2784	3302	3772	4312	4791	5032
W	in	7.7	7.7	8.5	9.4	14.0	15.7	17.7	19.7	17.7	17.7	22.0	22.0	27.9	35.4	35.4	30.0	30.0	30.0
	mm	195	195	215	240	355	400	450	500	450	450	560	560	710	900	900	760	760	760
L	in	–	–	–	–	–	–	–	–	14.3	14.3	16.3	16.3	18.4	21.8	21.8	21.8	20.2	20.2
	mm	–	–	–	–	–	–	–	–	362	362	414	414	468	554	554	554	512	512
WEIGHT	LB	52.9	75.0	90.4	143.3	257.9	401.3	782.8	1060.6	1528.1	2094.8	2535.8	3307.5	4961.3	6637.1	8180.6	11002.9	13582.8	14994.0
	Kg	24	34	41	65	117	182	355	481	693	950	1150	1500	2250	3010	3710	4990	6160	6800

GT KS 40K / ASME 600LB · GT KS 63K / ASME 900LB

BOLTED BONNET



■ GT KS 40K / ASME 600LB

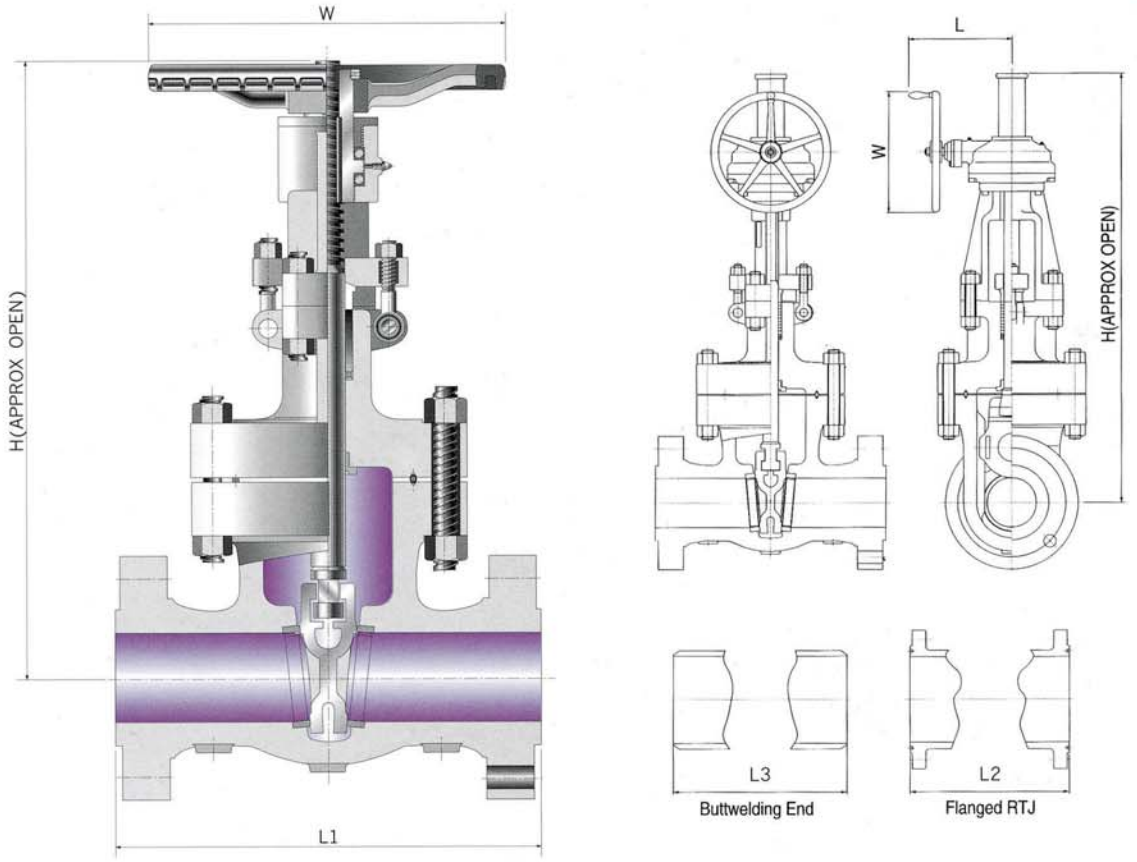
VALVE SIZE		2	2.5	3	4	6	8	10	12	14	16	18	20	24
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600
L1&L3	in	11.5	13.0	14.0	17.0	22.0	26.0	31.0	33.0	35.0	39.0	43.0	47.0	55.0
	mm	292	330	356	432	556	660	787	838	889	991	1092	1194	1397
L2	in	11.62	13.12	14.12	17.12	22.12	26.12	31.12	33.12	35.12	39.12	43.12	47.25	55.38
	mm	295	333	359	435	562	664	791	841	892	994	1095	1200	1406
H	in	18.7	21.6	23.5	26.8	36.6	45.7	53.1	61.8	72.1	82.9	98.0	104.8	116.9
	mm	475	550	598	680	930	1160	1350	1570	1832	2106	2489	2662	2970
W	in	7.7	7.7	9.4	11.8	17.7	17.7	19.7	22.0	22.0	27.9	27.9	31.5	35.4
	mm	195	195	240	300	450	450	500	560	560	710	710	800	900
L	in	–	–	–	–	–	–	–	16.3	16.3	18.4	18.4	20.7	26.4
	mm	–	–	–	–	–	–	–	414	414	468	468	526	670
WEIGHT	LB	16.3	26.3	31.7	55.3	113.4	183.7	294.8	390.0	562.4	639.5	1005.9	1274.8	1780.5
	Kg	36	58	70	122	250	405	650	860	1240	1410	2218	2811	3926

■ GT KS 63K / ASME 900LB

VALVE SIZE		2	2.5	3	4	6	8	10	12	14	16	18	20	24
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600
L1&L3	in	14.5	16.5	15.0	18.0	24.0	29.0	33.0	38.0	40.5	44.5	48.0	52.0	61.0
	mm	368	419	381	457	610	737	838	965	1029	1130	1219	1321	1549
L2	in	14.62	16.62	15.12	18.12	24.12	29.12	33.12	38.12	40.88	44.88	48.5	52.5	61.75
	mm	371	422	384	460	612	740	841	968	1038	1140	1232	1333	1568
H	in	21.2	26.4	26.4	30.8	42.4	55.5	67.7	77.4	74.9	80.7	88.8	110.2	124.0
	mm	539	670	672	782	1076	1411	1720	1965	1902	2051	2256	2800	3150
W	in	11.8	11.8	14.0	15.7	22.0	17.7	22.0	22.0	24.0	24.0	30.0	30.0	24.0
	mm	300	300	355	400	560	450	560	560	610	610	760	760	610
L	in	–	–	–	–	–	14.3	16.3	16.3	20.2	20.2	21.8	21.8	20.2
	mm	–	–	–	–	–	362	414	414	512	512	554	554	512
WEIGHT	LB	181	342	364	384	999	1720	2752	3400	4895.1	6615	8533.4	10716.3	16096.5
	Kg	82	155	165	174	453	780	1248	1542	2220	3000	3870	4860	7300

GT ASME 1500LB · GT ASME 2500LB

BOLTED BONNET



■ GT ASME 1500LB

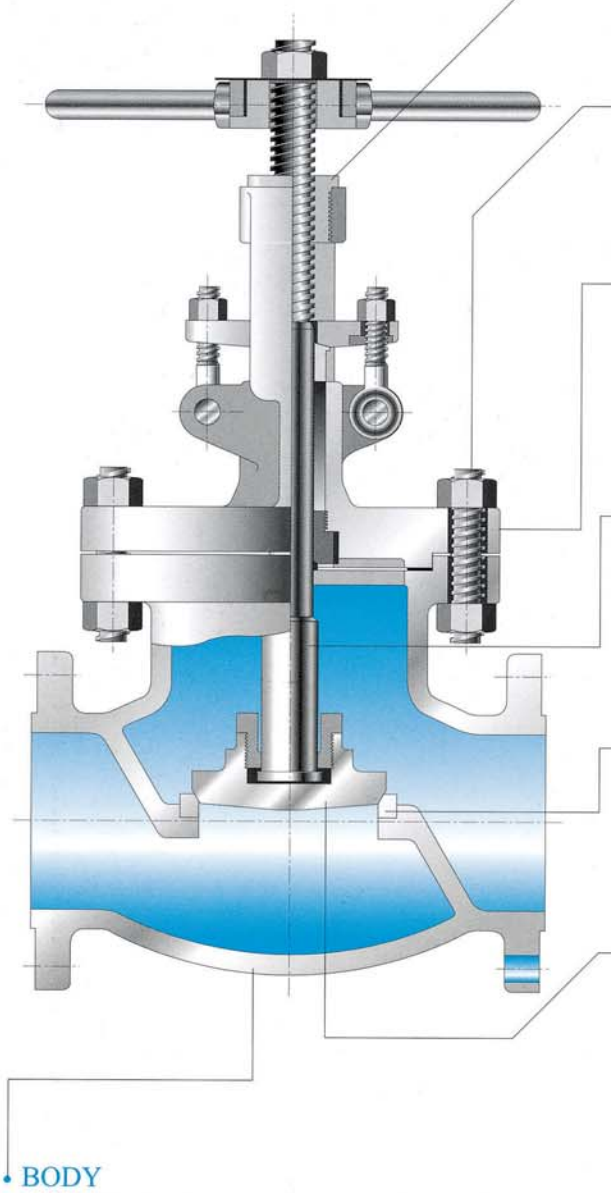
VALVE SIZE	in	2	2.5	3	4	6	8	10	12	14	16
	mm	50	65	80	100	150	200	250	300	350	400
L1&L3	in	14.5	16.5	18.5	21.5	27.75	32.75	39.0	44.5	49.5	54.5
	mm	368	419	470	546	705	832	991	1130	1257	1384
L2	in	14.62	16.62	18.62	21.62	28.0	33.13	39.38	45.12	50.25	55.38
	mm	371	422	473	549	711	841	1000	1146	1276	1406
H	in	21.2	26.4	29.1	30.8	47.1	60.8	66.5	82.3	85.1	97.9
	mm	539	670	738	783	1196	1546	1688	2090	2162	2486
W	in	11.8	11.8	15.7	19.7	13.8	22.0	27.9	27.9	30.0	30.0
	mm	300	300	400	500	350	560	710	710	760	760
L	in	–	–	–	–	13.1	16.3	18.4	18.4	21.8	21.8
	mm	–	–	–	–	332	414	468	468	554	554
WEIGHT	LB	181	341.8	401	573	1360	3175	4412	8414	9073.6	15324.8
	Kg	82	155	182	260	617	1440	2001	3816	4115	6950

■ GT ASME 2500LB

VALVE SIZE	in	2	2.5	3	4	6	8	10	12
	mm	50	65	80	100	150	200	250	300
L1&L3	in	17.75	20.0	22.75	26.5	36.0	40.25	50.0	56.0
	mm	451	508	578	673	914	1022	1270	1422
L2	in	17.87	20.25	23.0	26.88	36.5	40.87	50.88	56.88
	mm	454	514.	584	683	927	1038	1292	1445
H	in	24.4	31.9	31.9	42.2	57.1	63.0	82.5	90.2
	mm	619	809	809	1073	1451	1600	2096	2292
W	in	11.8	17.7	17.7	24.8	24.0	24.0	24.0	30.0
	mm	300	450	450	630	610	610	610	760
L	in	–	–	–	–	17.0	20.2	20.2	21.8
	mm	–	–	–	–	432	512	512	554
WEIGHT RF	lb	184	298	399	1202	3155	4841	9076	14246
	kg	84	135	181	545	1431	2196	4117	6462
WEIGHT BW	lb	115	198	260	974	2579	3968	7540	11905
	kg	52	90	118	442	1170	1800	3420	5400

CAST STEEL GLOBE VALVES

BOLTED BONNET



• YOKE BUSH

The standard material of the Yoke Sleeve is Nodular Ni-resist D2 with over a 1150°C(2100°F)dissolution point in conformity with API Std. Specifications.

• BOLTING

TThe body-bonnet bolts are manufactured in accordance with API Std. 600 specifications. The nuts also strictly conform with ANSI B1.1 The stud-bolt nuts, hexagonal, rigid and hot-forged, bear material notation as well as do the bolt nuts made according to ANSI B18.2.2

• BONNET

The bonnet is integral or separate with yoke and is the same material as the body. The body-bonnet flange drilling is spot-faced to exactly meet stud bolt nuts. The back seat bushing in the bonnet guarantees that the packing can be replaced even when the valve is fully opened. The stem packing dimensions of the stuffing box are in accordance with API specifications.

• STEM

The heat-treated stems of one-piece construction insure adequate mechanical properties and surface hardness.
Friction at the time of opening and shutting is reduced to a minimum friction to accurate machining and lapping.
The round finished surface of the stem head helps to achieve point contact with the inside of the disc housing to eliminate friction.

• SEAT RING

The shoulder seated type seatring is welded or screwed into body. The seating surface is finished by lapping. The seatring is forged and heat-treated to deliver the best mechanical properties and required hardness. The difference in hardness betwwn the seats and disc conforms to API Std. specifications.

• DISC

The disc of our globe valves is a loose disc and can freely revolve around the stem. The prevents friction and galling with the seating surface when the valve is shut. The disc is furnished with a conical seating surface that has been ground and lapped to a mirror finish.
It is of one-piece construction, and forged and heat-treated to deliver the required mechanical properties and hardness.

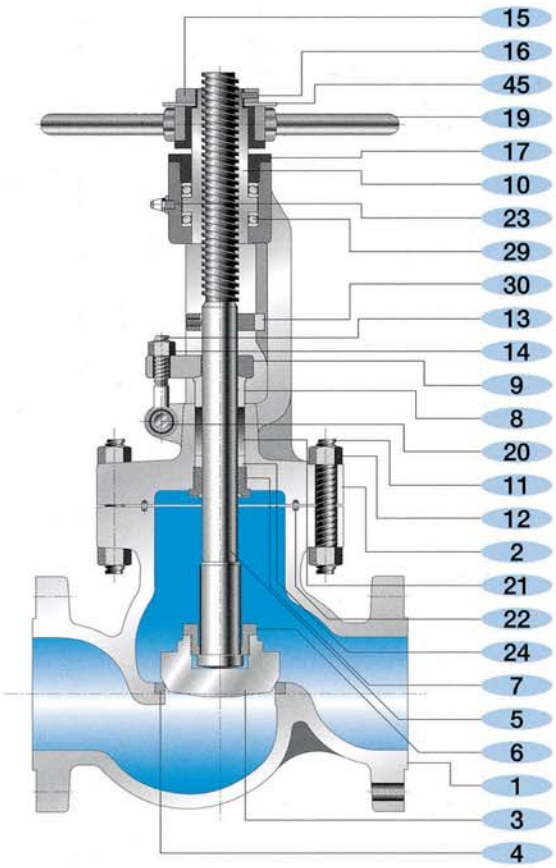
• BODY

The cast steel body is designed to insure a wall thickness which is greater at any point than the minimum specified by API Std. 600. Port and seat passage dimensions conform to ANSI B16.5 Pipe Fitting.

The screw-in type seatring is standard to allow interchangeability.

The standard body-bonnet joint is male-female, and the flange is round for all valves, Accurate machining insures perfact coaxiality of the vale ends and seatring in addition to exact perpendicularity of the body-bonnet flanges.

CAST STEEL
BOLTED BONNET



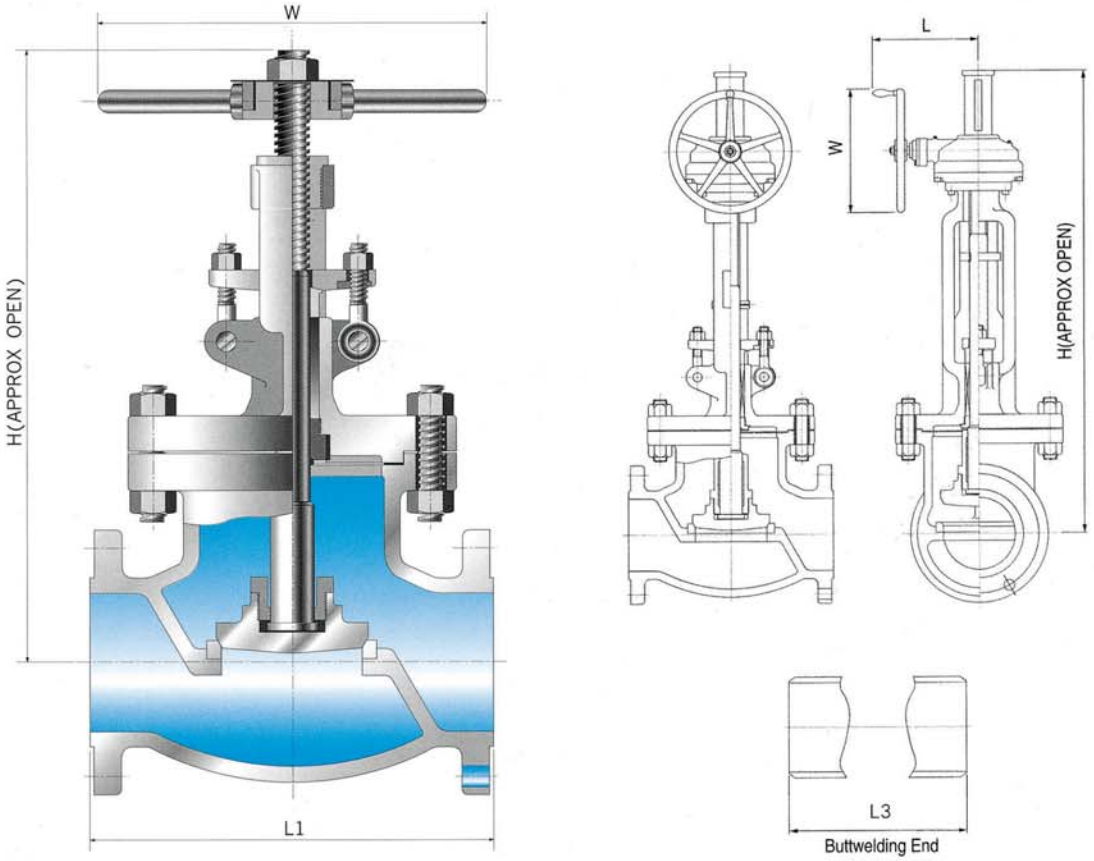
NO	NAME OF PART	ASTM SPECIFICATION	KS SPECIFICATION
15	HANDLE NUT	STEEL	STEEL
16	SET SCREW	STEEL	STEEL
17	SLEEVE GLAND	STEEL	STEEL
19	HANDWHEEL	A395	FCD45
21	PACKING	COMMERCIAL	COMMERCIAL
22	GASKET	COMMERCIAL	COMMERCIAL
23	GREASE NIPPLE	STEEL	STEEL
29	BEARING	COMMERCIAL	COMMERCIAL
30	STOPPER	A283-D	STEEL
45	WASHER	STEEL	STEEL

NO	NAME OF PART	ASTM SPECIFICATION					KS SPECIFICATION
		STANDARD	HIGH TEMPERATURE SERVICE			LOW TEMPERATURE SERVICE	STANDARD
1	BODY	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A352-LCB	SCPH 2
2	BONNET	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A352-LCB	SCPH 2
3	*DISC	A217-CA15	A217-WC1	A217-WC6	A217-WC9	A352-LCB	SSC 1
4	BODY SEAT RING	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A182-F304	STEEL + 13CR
5	STEM	A182-F6a	A182-F6a	A182-F6a	A182-F6a	A182-F304	STS 410
6	DISC GLAND	A217-CA15	A217-CA15	A217-CA15	A217-CA15	A182-F304	SSC 1
7	BONNET BUSH	A276-410	A276-410	A276-410	A276-410	A276-304	STS 410
8	PACKING GLAND	A276-410	A276-410	A276-410	A276-410	A276-304	STS 410
9	GLAND FLANGE	A105	A105	A105	A105	A105	SF 45
10	YOKE SLEEVE	A439-D2C	A439-D2C	A439-D2C	A439-D2C	A439-D2C	FCD 45
11	BONNET BOLT	A193-B7	A193-B7	A193-B16	A193-B16	A320-L7	SNB 7
12	BONNET NUT	A194-2H	A194-2H	A194-4	A194-4	A194-4	SM 45C
13	GLAND BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A320-L7	SM 45C
14	GLAND NUT	A194-2H	A194-2H	A194-2H	A194-2H	A194-4	SM 45C
20	HINGE PIN	A276-410	A276-410	A276-410	A276-410	A276-304	SM 45C
24	LANTERN	A276-410	A276-410	A276-410	A276-410	A276-304	STS 410

*Note : In case of 8" and larger size, we'll use trim material overlayed one on the same or equivalent material of the Body.

GL KS 10K / ASME 150LB · GL KS 20K / ASME 300LB

BOLTED BONNET



■ GL KS 10K / ASME 150LB

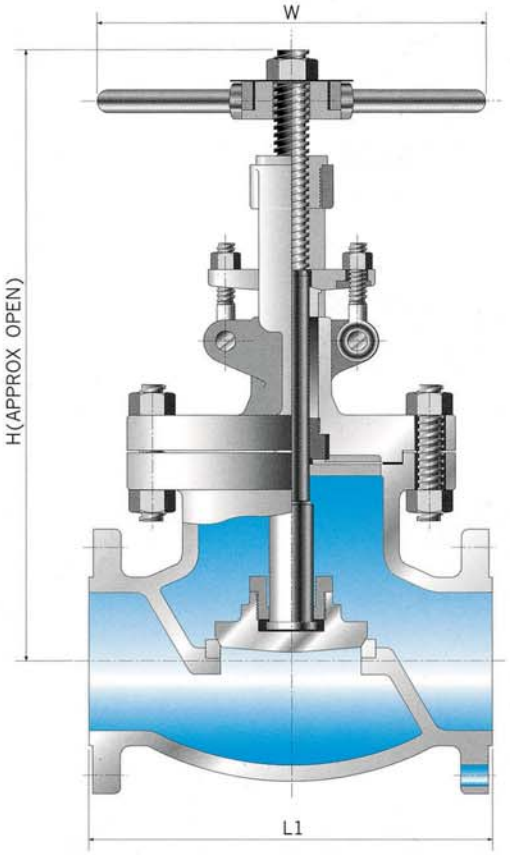
VALVE SIZE		2	2.5	3	4	6	8	10	12	14	16	18	20	24
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600
L1&L3	in	8.0	8.5	9.5	11.5	16.0	19.5	24.5	27.5	31.0	36.0	38.5	38.5	51.0
	mm	203	216	241	292	406	495	622	698	787	914	978	978	1295
H	in	10.8	11.4	12.5	13.7	17.3	22.0	26.4	29.1	54.7	62.6	71.7	80.7	90.6
	mm	275	290	320	350	440	560	670	740	1390	1590	1820	2050	2300
W	in	7.7	7.7	8.5	9.4	11.8	14.0	15.7	17.7	22.0	22.0	24.0	27.6	27.6
	mm	195	195	215	240	300	355	400	450	560	560	610	700	700
L	in	–	–	–	–	–	–	–	–	16.3	16.3	17.0	17.0	17.0
	mm	–	–	–	–	–	–	–	–	414	414	432	432	432
WEIGHT	LB	46.3	59	72.8	116.9	209.5	410.1	524.8	804.8	1364.9	1808.1	2154.3	2712.2	3472.9
	Kg	21	27	33	53	95	186	238	365	619	820	977	1230	1575

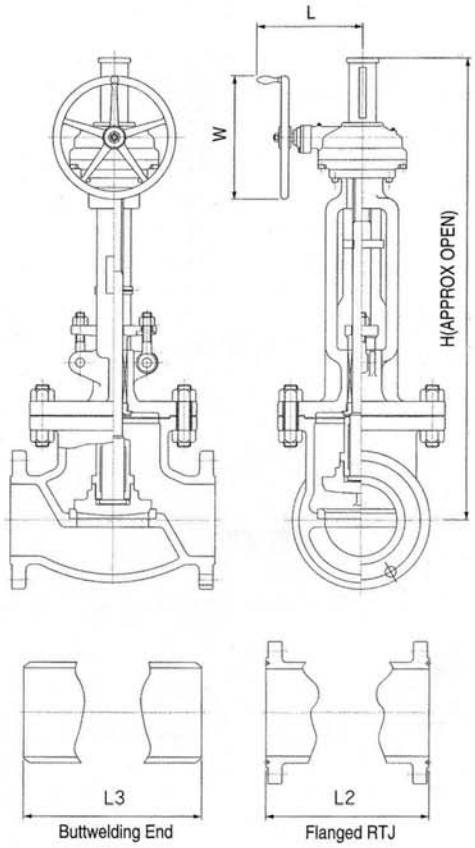
■ GL KS 20K / ASME 300LB

VALVE SIZE		2	2.5	3	4	6	8	10	12	14	16	18	20	24	32
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600	800
L1&L3	in	10.5	11.5	12.5	14.0	17.5	22.0	24.5	28.0	33.0	34	38.5	40	53	62.75
	mm	267	292	318	356	444	559	622	711	838	864	978	1016	1346	1594
L2	in	11.12	12.12	13.12	14.62	18.12	22.62	25.12	28.62	33.6	34.6	38.8	40.6	53.6	63.4
	mm	283	308	333	371	460	575	638	727	854	880	986	1032	1362	1610
H	in	14.4	15.7	16.1	18.9	24.4	29.5	31.5	37.6	54.7	62.6	71.7	80.7	90.6	122.0
	mm	365	400	410	480	620	750	800	955	1390	1590	1820	2050	2300	3100
W	in	7.7	8.5	9.4	10.6	14.0	15.7	17.7	19.7	22.1	27.6	27.6	27.6	31.5	31.5
	mm	195	215	240	270	355	400	450	500	560	700	700	700	800	800
L	in	–	–	–	–	–	–	–	–	16.3	18.4	18.4	18.4	20.7	20.7
	mm	–	–	–	–	–	–	–	–	414	468	468	468	526	526
WEIGHT	LB	61.7	86.0	99.2	189.6	330.8	621.8	809.2	1045.2	1907.3	2529.1	3014.2	3572.1	5159.7	7364.7
	Kg	28	39	45	86	150	282	367	474	865	1147	1367	1620	2340	3340

GL KS 40K / ASME 600LB · GL KS 63K / ASME 900LB

BOLTED BONNET





■ GL KS 40K / ASME 600LB

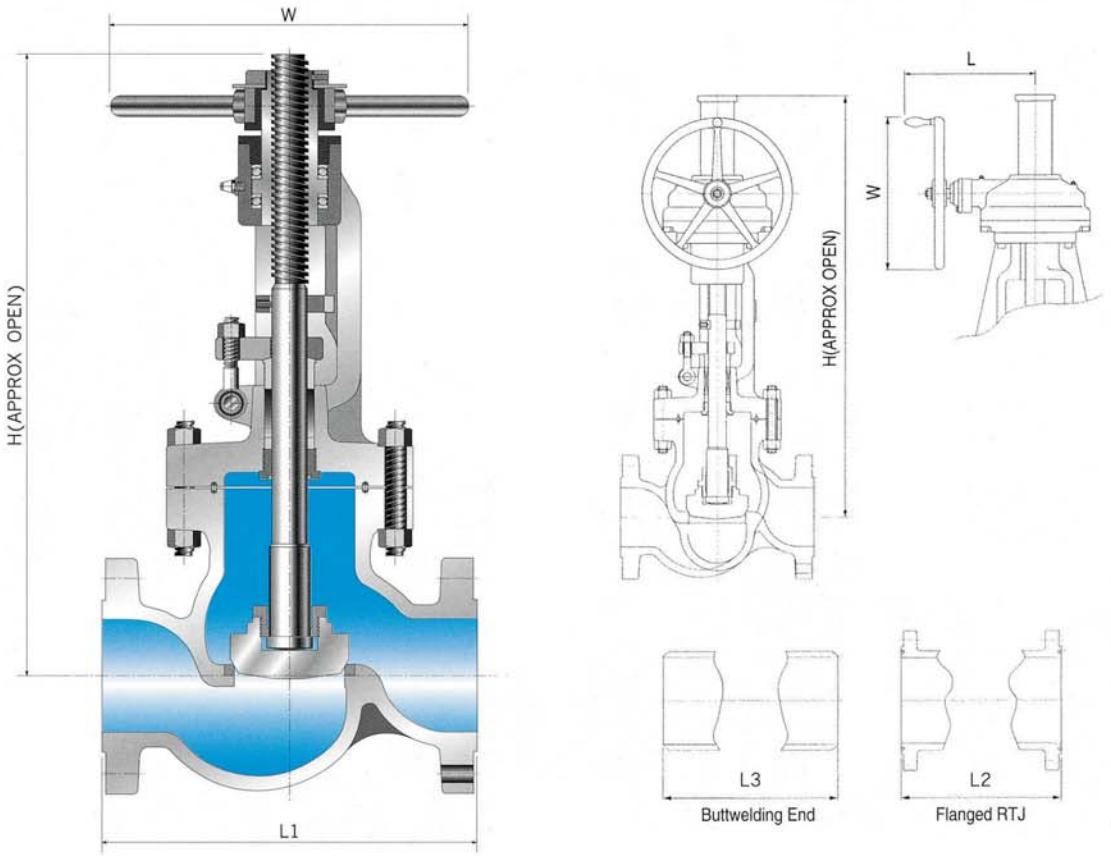
VALVE SIZE											
	in	2	2.5	3	4	6	8	10	12	14	16
	mm	50	65	80	100	150	200	250	300	350	400
L1&L3	in	11.5	13.0	14.0	17.0	22.0	26.0	31.0	33.0	35.0	39.0
	mm	292	330	356	432	559	660	787	818	889	991
L 2	in	11.62	13.12	14.12	17.12	22.12	26.12	31.12	33.12	35.12	39.12
	mm	295	333	359	435	562	664	792	841	892	994
H	in	16.0	19.8	19.9	22.4	29.9	51.8	59.5	69.9	70.9	76.0
	mm	407	502	505	568	759	1315	1511	1775	1800	1930
W	in	7.7	8.5	10.6	11.8	14.0	28.0	31.5	35.4	35.4	35.4
	mm	195	215	270	300	355	710	800	900	900	900
L	in	–	–	–	–	–	18.4	20.7	26.4	26.4	26.4
	mm	–	–	–	–	–	468	526	670	670	670
WEIGHT	LB	114.5	141.1	187.4	330.8	714.4	1234.8	1741.9	2264.5	2932.7	3825.7
	Kg	52	64	85	150	324	560	790	1027	1330	1735

■ GL KS 63K / ASME 900LB

VALVE SIZE										
	in	2	2.5	3	4	6	8	10	12	14
	mm	50	65	80	100	150	200	250	300	350
L1&L3	in	14.5	16.5	15.0	18.0	24.0	29.0	33.0	38.0	40.5
	mm	368	419	381	457	610	737	838	965	1029
L 2	in	14.62	16.62	15.12	18.12	24.12	29.12	33.12	38.12	40.88
	mm	371	422	384	460	613	740	841	968	1038
H	in	27.4	27.4	30.5	33.7	50.7	65.6	63.0	67.1	87.0
	mm	695	695	775	855	1288	1665	1600	1705	2210
W	in	15.7	15.7	15.7	15.7	22.0	31.5	31.5	35.4	35.4
	mm	400	400	400	400	560	800	800	900	900
L	in	–	–	–	–	16.3	20.7	20.7	26.4	26.4
	mm	–	–	–	–	414	526	526	670	670
WEIGHT	LB	271.2	341.8	231.5	441	1101.5	2756.3	4520.3	5843.3	8048.3
	Kg	123	155	105	200	500	1250	2050	2650	3650

GL ASME 1500LB · GL ASME 2500LB

BOLTED BONNET



■ GL ASME 1500LB

VALVE SIZE										
	in	2	2.5	3	4	6	8	10	12	14
	mm	50	65	80	100	150	200	250	300	350
L1&L3	in	14.5	16.5	18.5	21.5	27.75	32.75	39.0	44.5	49.5
	mm	368	419	470	546	705	832	991	1130	1257
L 2	in	14.62	16.62	18.62	21.62	28.0	33.13	39.38	45.12	50.25
	mm	371	422	473	549	711	841	1000	1146	1276
H	in	27.4	27.4	31.5	40.0	53.0	77.2	91.0	105.1	126.0
	mm	695	695	799	1015	1345	1960	2310	2670	3200
W	in	15.7	15.7	19.7	19.7	28.0	28.0	30.0	30.0	30.0
	mm	400	400	500	500	710	710	760	760	760
L	in	–	–	–	–	18.4	18.4	20.2	20.2	22.3
	mm	–	–	–	–	468	468	512	512	567
WEIGHT	lb	271.2	341.8	396.9	749.7	1482	4630.5	7055.0	9702.0	11907.0
	kg	123	155	180	340	627	2100	3200	4400	5400

■ GL ASME 2500LB

VALVE SIZE									
	in	2	2.5	3	4	6	8	10	12
	mm	50	65	80	100	150	200	250	300
L1&L3	in	17.75	20.0	22.75	26.5	36.0	40.25	50.0	56.0
	mm	451	508	578	673	914	1022	1270	1422
L 2	in	17.87	20.25	23.0	26.88	36.5	40.87	50.88	56.88
	mm	454	514.	584	683	927	1038	1292	1445
H	in	28.3	31.5	34.8	50.0	75.0	97.0	100.2	138.0
	mm	720	800	885	1260	1905	2465	2800	3505
W	in	15.7	19.7	19.7	24.0	24.0	30.0	30.0	30.0
	mm	400	500	500	610	610	760	760	760
L	in	–	–	–	20.2	17.0	22.3	22.3	22.3
	mm	–	–	–	512	432	567	567	567
WEIGHT RF	lb	377	595	694	1667	4564	9524	13492	16865
	kg	171	270	315	756	2070	4320	6120	7650
WEIGHT BW	lb	317	476	556	1369	3968	8730	11905	14881
	kg	144	216	252	621	1800	3960	5400	6750

CAST STEEL SWING CHECK VALVES

BOLTED COVER

BOLTING

The body-cover bolting conforms with ANSI B 1.1
The nuts are manufactured to conform with ANSI B18.2.2

COVER

The cover material is identical to the body.
Depending on the valve size and pressure class, either a casting or a forging is used.

HINGE PIN

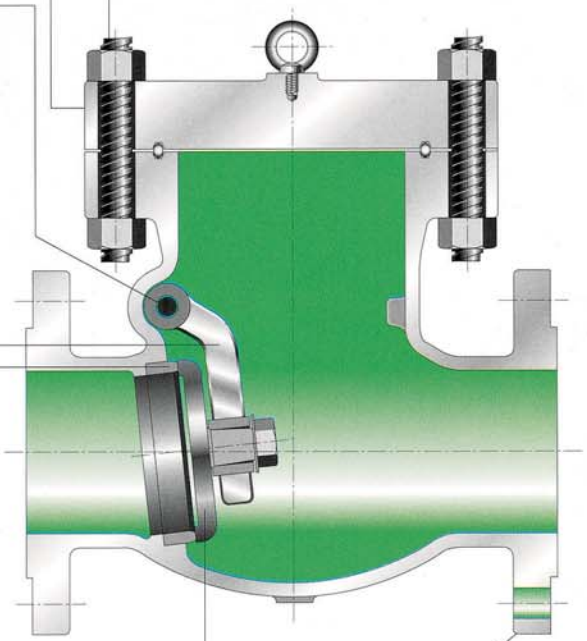
The hinge pin is inserted into the valve and held in position by plug.
The larger size valves are provided with bolted flanges instead of plugs.

ARM

The arm material is identical to the body.
Hinge bushing is provided in the larger valve sizes to minimize friction and eliminate seizing.

SEAT RING

The bottom seated type seat ring is screwed into body. The seating surface is finished by lapping.
The forged seat ring is heat-treated to deliver the best mechanical properties and required hardness.



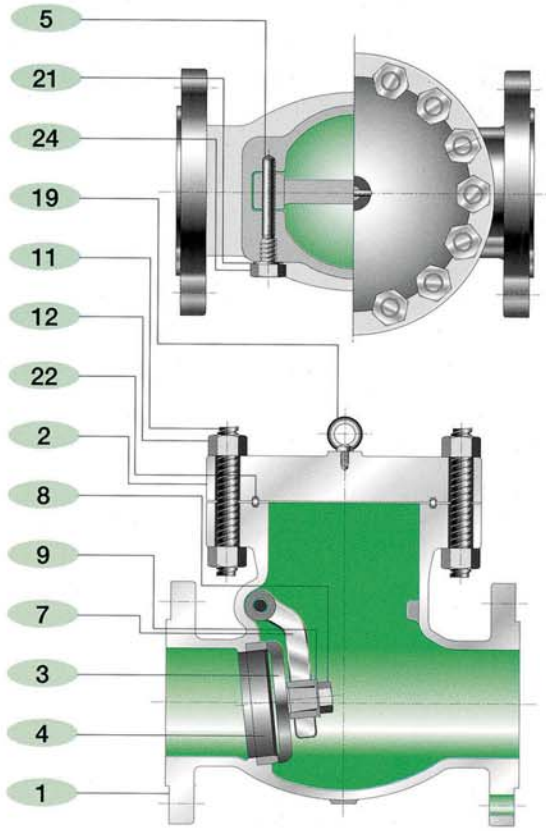
DISC

The disc has a sufficient seating surface area which is ground and lapped to a mirror finish.
It is of one-piece construction and is heat treated to deliver the required mechanical properties and hardness.

BODY

The cast steel body is designed with a wall thickness which is greater at any point than the minimum requirement provided by API Std. 600 or API6D. Port and seat passage dimensions conform to ANSI B16.5 Pipe Fitting. The welded-in type seat ring is standard to allow interchangeability.
The standard body-bonnet joint is male-female, and the flange is round for all valves.

CAST STEEL
BOLTED COVER



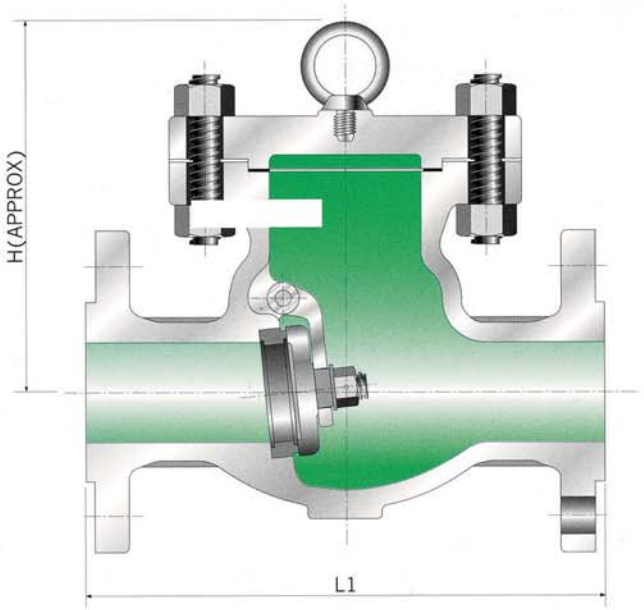
NO	NAME OF PART	ASTM SPECIFICATION	KS SPECIFICATION
8	DISC NUT	AISI 304	SM 45C
9	DISC WASHER	AISI 304	STS 304
19	EYE BOLT	A105	SM 25C
21	PLUG GASKET	COMMERCIAL	COMMERCIAL
22	GASKET	COMMERCIAL	COMMERCIAL
24	PLUG	A105	SCM 440

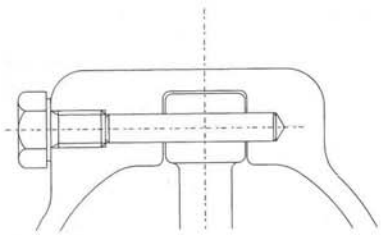
NO	NAME OF PART	ASTM SPECIFICATION				KS SPECIFICATION
		STANDARD	HIGH TEMPERATURE SERVICE			LOW TEMPERATURE SERVICE	STANDARD
1	BODY	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A352-LCB	SCPH 2
2	COVER	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A352-LCB	SCPH 2
3	*DISC	A217-CA15	A217-WC1	A217-WC6	A217-WC9	A352-LCB	SSC 1
4	BODY SEAT RING	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A182-F304	STEEL + 13CR
5	HINGE PIN	A276-410	A276-410	A276-410	A276-410	A276-304	STS 410
7	ARM	A216-WCB	A216-WC1	A216-WC6	A216-WC9	A352-LCB	SCPH 2
11	BONNET BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A320-L7	SNB 7
12	BONNET	A194-2H	A194-2H	A194-2H	A194-2H	A194-4	SM 45C

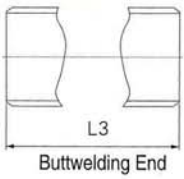
*Note : In case of 8" and larger size, we'll use trim material overlayed one on the same or equivalent material of the Body.

SW/CH KS 10K / ASME 150LB · SW/CH KS 20K / ASME 300LB

BOLTED COVER







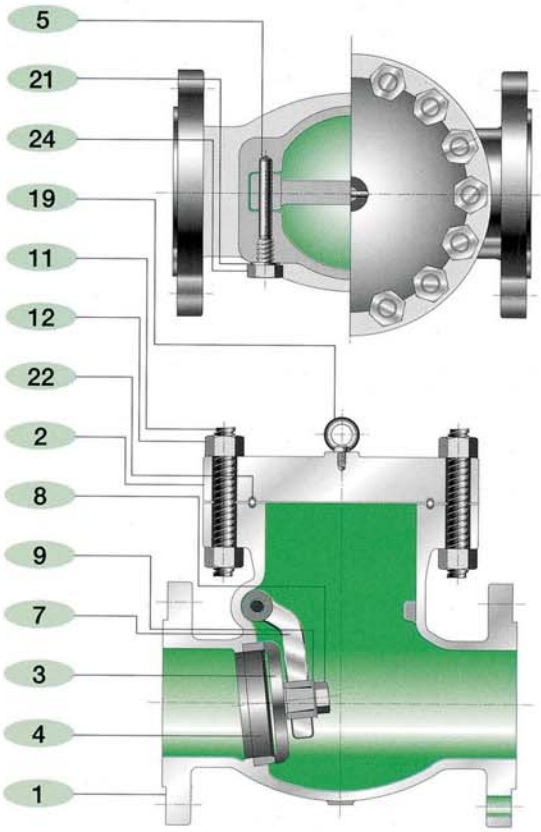
■ SW/CH KS 10K / ASME 150LB

VALVE SIZE	in	2	2.5	3	4	6	8	10	12	14	16	18	20	24	28	30
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600	700	750
L1&L3	in	8.0	8.5	9.5	11.5	16.0	19.5	24.5	27.5	310	36.0	38.5	38.5	51.0	57.0	60.0
	mm	203	216	241	292	356	495	622	698	787	86.4	978	978	1295	1448	1524
H	in	6.1	6.7	7.3	7.9	10.0	12.0	13.6	15.0	18.1	21.5	25.6	26.4	35.4	40.0	45.2
	mm	155	170	185	200	255	305	345	380	460	545	650	670	900	1016	1149
WEIGHT	LB	33.1	48.5	59.5	90.4	176.4	313.1	390.3	639.5	862.2	1016.5	1411.2	1719.9	3285.5	4520.3	6392.3
	Kg	15	22	27	41	80	142	177	290	391	461	640	780	1490	2050	2899

■ SW/CH KS 20K / ASME 300LB

VALVE SIZE	in	2	2.5	3	4	6	8	10	12	14	16	18	20	24	28
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600	700
L1&L3	in	10.5	11.5	12.5	14.0	17.5	21.0	24.5	28.0	33.0	34.0	38.5	40.0	53.0	59.0
	mm	267	292	318	356	444	533	622	711	838	864	978	1016	1346	1499
L2	in	11.12	12.12	13.12	14.62	18.12	21.62	25.12	28.62	33.62	34.62	39.12	40.75	53.88	60.0
	mm	283	308	333	371	460	549	638	727	854	880	994	1035	1368	1524
H	in	6.9	7.5	8.1	8.7	125.8	14.5	18.6	20.9	22.8	27.4	31.4	30.6	39.6	45.2
	mm	175	190	205	220	326	368	473	530	580	695	797	776	1007	1149
WEIGHT	LB	41.9	66.2	77.2	119.1	282.4	463.1	590.9	915	1503.8	1647.1	2756.3	3307.5	4917.2	6504.8
	Kg	19	30	35	54	128	210	268	415	682	747	1250	1500	2230	2950

CAST STEEL
BOLTED COVER



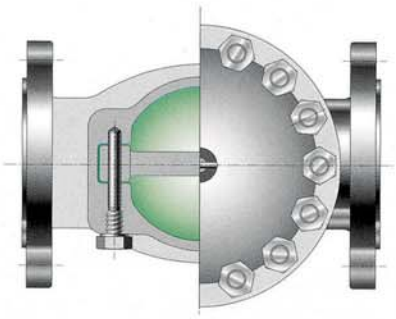
NO	NAME OF PART	ASTM SPECIFICATION	KS SPECIFICATION
8	DISC NUT	AISI 304	SM 45C
9	DISC WASHER	AISI 304	STS 304
19	EYE BOLT	A105	SM 25C
21	PLUG GASKET	COMMERCIAL	COMMERCIAL
22	GASKET	COMMERCIAL	COMMERCIAL
24	PLUG	A105	SCM 440

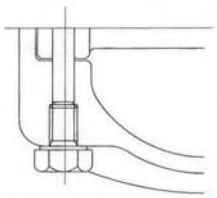
NO	NAME OF PART	ASTM SPECIFICATION					KS SPECIFICATION
		STANDARD	HIGH TEMPERATURE SERVICE			LOW TEMPERATURE SERVICE	STANDARD
1	BODY	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A352-LCB	SCPH 2
2	COVER	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A352-LCB	SCPH 2
3	*DISC	A217-CA15	A217-WC1	A217-WC6	A217-WC9	A352-LCB	SSC 1
4	BODY SEAT RING	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A182-F304	STEEL + 13CR
5	HINGE PIN	A276-410	A276-410	A276-410	A276-410	A276-304	STS 410
7	ARM	A216-WCB	A216-WC1	A216-WC6	A216-WC9	A352-LCB	SCPH 2
11	BONNET BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A320-L7	SNB 7
12	BONNET	A194-2H	A194-2H	A194-2H	A194-2H	A194-4	SM 45C

*Note : In case of 8" and larger size, we'll use trim material overlayed one on the same or equivalent material of the Body.

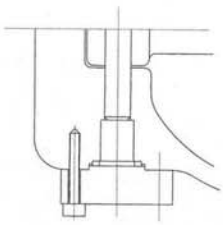
SW/CH ASME 1500LB · SW/CH ASME 2500LB

BOLTED COVER

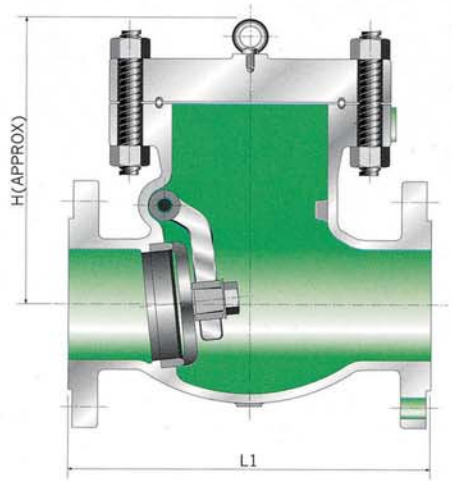


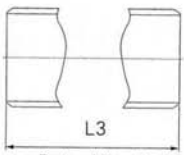


8″ & Under

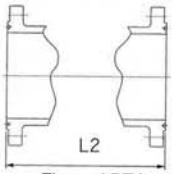


10″ & Lager





Buttwelding End



Flanged RTJ

■ SW / CH ASME 1500LB

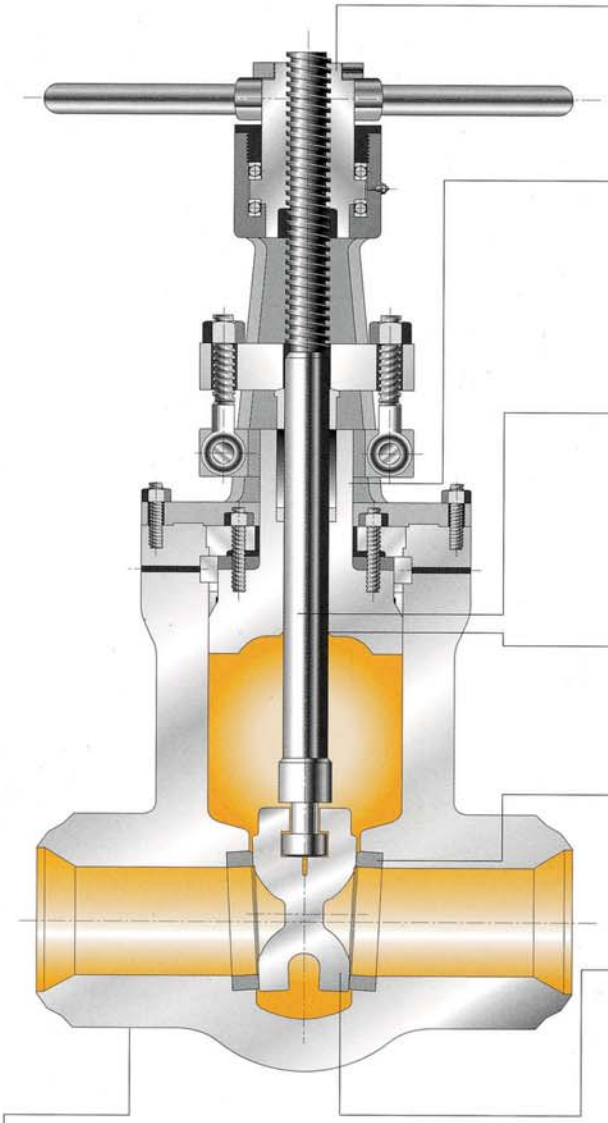
VALVE SIZE	in	2	2.5	3	4	6	8	10	12	14
	mm	50	65	80	100	150	200	250	300	350
L1&L3	in	14.5	16.5	18.5	21.5	27.75	32.75	39.0	44.5	49.5
	mm	368	419	470	546	705	832	991	1130	1257
L 2	in	14.62	16.62	18.62	21.62	28.0	33.13	39.38	45.12	50.25
	mm	371	422	473	549	711	841	1000	1146	1276
H	in	13.1	13.7	15.3	16.5	23.1	26.8	29.8	39.7	40.8
	mm	333	349	389	419	587	680	756	1008	1035
WEIGHT	LB	271.2	341.8	396.9	749.7	1482	4630.5	7055.0	9702.0	11907.0
	Kg	123	155	180	340	627	2100	3200	4400	5400

■ SW / CH ASME 2500LB

VALVE SIZE	in	2	2.5	3	4	6	8	10	12	14	16
	mm	50	65	80	100	150	200	250	300	350	400
L1&L3	in	17.75	20.0	22.75	26.5	36.0	40.25	50.0	56.0	62.0	68.0
	mm	451	508	673	673	914	1022	1270	1422	–	–
L 2	in	17.87	20.25	26.88	26.88	36.5	40.87	50.88	56.88	–	–
	mm	454	514	683	683	927	1038	1292	1445	–	–
H	in	16.4	16.5	18.9	18.9	20.1	28.0	33.5	39.4	47.2	51.1
	mm	416	419	479	479	511	711	851	1000	1200	1299
WEIGHT RF	lb	298	476	694	1290	2877	5060	7837	11310	–	–
	kg	135	216	315	585	1305	2295	3555	5130	–	–
WEIGHT BW	lb	238	387	556	1071	2381	4365	6250	9028	12302	16075
	kg	108	176	252	486	1080	1980	2835	4095	5580	7290

CAST STEEL GATE VALVES

PRESSURE SEAL BONNET



YOKE SLEEVE

The upper portion of the Yoke Sleeve is hexagonally tapered to fix the handwheel. The standard material of the Yoke Sleeve is Nodular Ni-resist D2 with over a 1150°C(2100°F)dissolution point in accordance with API Std. Specifications.

BONNET

The bonnet is of a steel forging identical to the body to insure high reliability. The bonnet has a perfect body-bonnet seal and both ease of dismantling and reassembly are ensured. The bodies and bonnets of the valve are machined by special purpose machines to achieve perfect coaxiality and eliminate any misalignment which may damage the stems.

STEM

The machined forged stem comes with a T-shape head, which connects the slot of the wedge. The contacting surface of the head is spherically shaped, thereby giving it greater strength and durability. It is heat treated to give it adequate mechanical properties and surface hardness. Accurate machining and lapping insure minimized friction during opening and shutting.

BACK SEAT

All of our valves are provided with positive backseat, and packing replacement can be done with the valve fully open.
The conical seat and the guide are integrally stellite faced.

SEAT RING

The Stellite 6 surface of the seat ring is integrally applied to the body by means of welding in all valve sizes.
Lapping applied to the seating surface ensures perfect mating surface ensures perfect mating with the wedge surfaces.

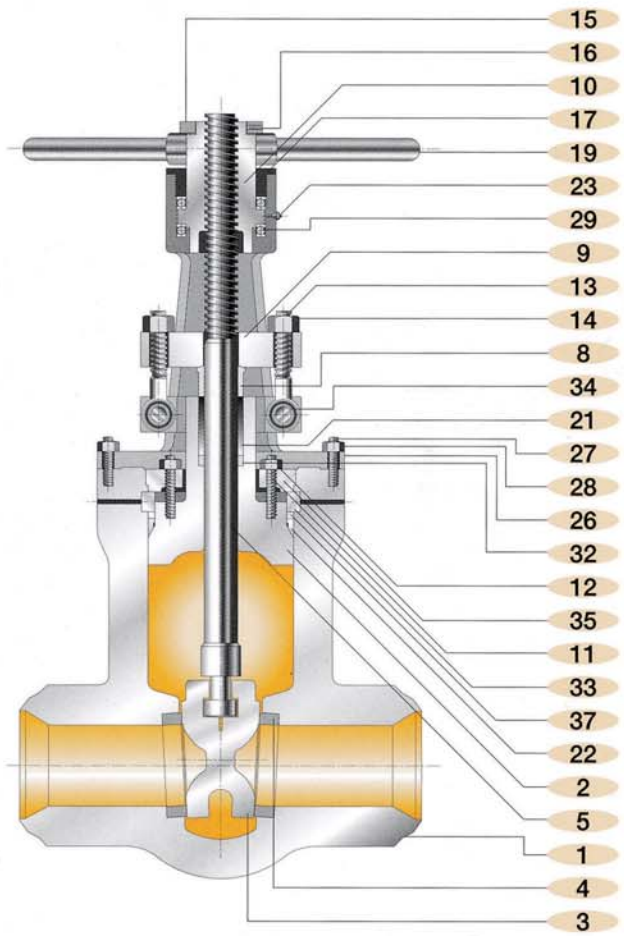
FLEXIBLE WEDGE

The flexible wedge designed to absorb thermally-induced body distortion, thereby making it ideal for high temperature steam or water supply piping. A Stellite 6 layer is applied to the seating surface, and this deposit is subjected to a special heat treatment to secure required hardness and soundness.
The lapped finish then insures perfect mating with the seats.

BODY

The valve body is cylindrically shaped to prevent distortion or undue stress during extreme working conditions. In addition, adequate padding helps to achieve a sound cast structure in critical area. The wall thickness is greater than, or in accordance with API, ANSI and ASME requirements. The contact surfaces ensure that a minimum specific pressure is achieved. The area contacting the pressure seal gasket has a stainless steel 18/8 inlay to eliminate corrosion or wire drawing and to insure easy dismantling at all times. The close tolerances of the inside diameter of this area are attained by accurate machining and honing finish.

CAST STEEL
PRESSURE SEAL BONNET



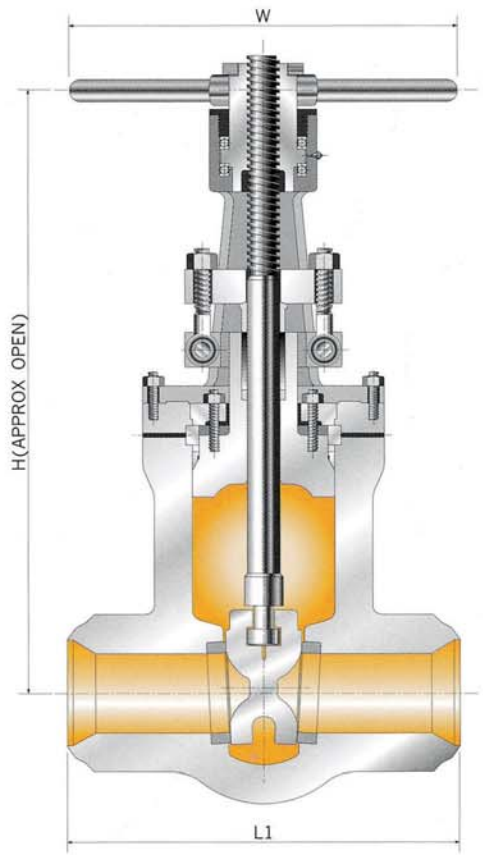
NO	NAME OF PART	ASTM SPECIFICATION
15	HANDLE NUT	STEEL
16	SET SCREW	STEEL
17	SLEEVE GLAND	STEEL
19	HANDWHEEL	A395
21	PACKING	COMMERCIAL
22	GASKET	COMMERCIAL
23	GREASE NIPPLE	STEEL
29	BEARING	COMMERCIAL

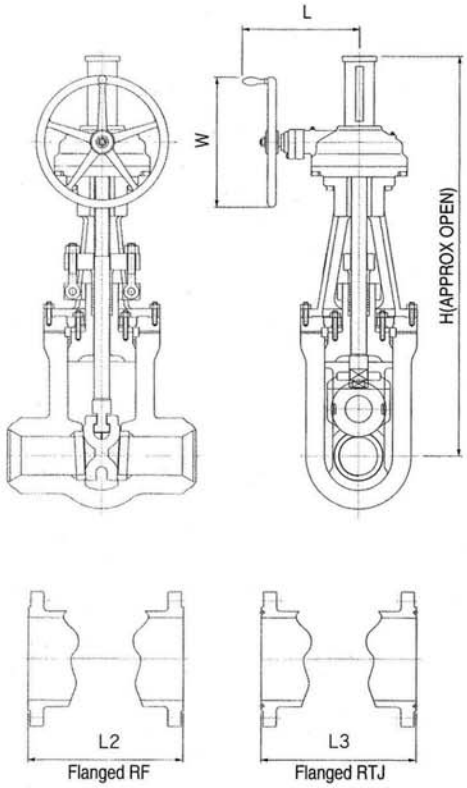
NO	NAME OF PART	ASTM SPECIFICATION						
		STANDARD	HIGH TEMPERATURE SERVICE				LOW TEMPERATURE SERVICE	
1	BODY	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
2	BONNET	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
3	*DISC	A217-CA15	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
4	BODY SEAT RING	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A182-F304	A182-F304
5	STEM	A182-F6a	A182-F6a	A182-F6a	A182-F6a	A182-F6a	A182-F304	A182-F304
8	PACKING GLAND	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
9	GLAND FLANGE	A105	A105	A105	A105	A105	A105	A105
10	YOKE SLEEVE	A439-D2C	A439-D2C	A439-D2C	A439-D2C	A439-D2C	A439-D2C	A439-D2C
11	BONNET BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A320-L7	A320-L7
12	BONNET NUT	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-4	A194-4
13	GLAND BOLT	A193-B7	A193-B7	A194-B7	A194-B7	A194-B7	A320-L7	A320-L7
14	GLAND NUT	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-4	A194-4
26	YOKE	A216-WCB	A216-WC1	A216-WC6	A216-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
27	YOKE BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A320-L7	A320-L7
28	YOKE NUT	A194-2H	A194-2H	A194-4	A194-4	A194-4	A194-4	A194-4
32	PACKING WASHER	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
33	RETAINER	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
34	HINGE CLAMP	A216-WCB	A216-WC1	A216-WC6	A216-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
35	BONNET CLAMP	A216-WCB	A216-WC1	A216-WC6	A216-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
37	GASKET SPACER	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304

*Note : In case of 6″ and larger size, we'll use trim material overlayed one on the same or equivalent material of the Body.

GT ASME 600LB · GT ASME 900LB

PRESSURE SEAL BONNET





■ GT ASME 600LB

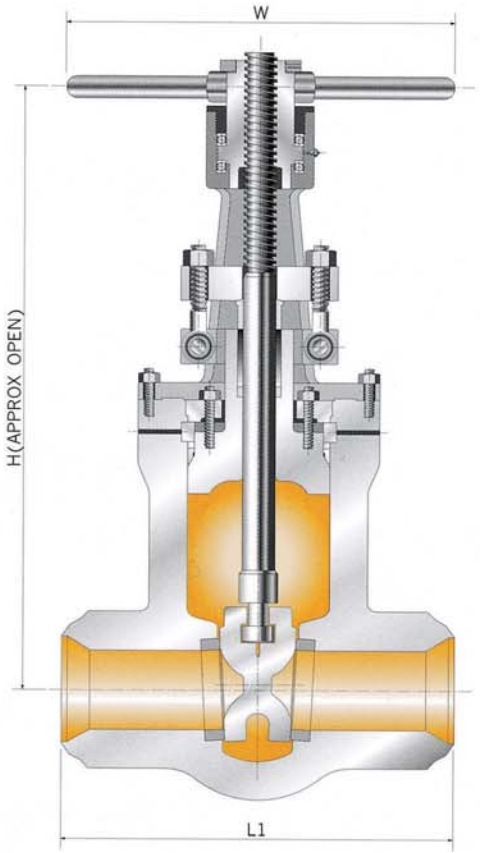
VALVE SIZE		2	2.5	3	4	6	8	10	12	14	16	18	20	24
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600
L1	in	7.0	8.5	10.0	12.0	18.0	23.0	28.0	32.0	35.0	39.0	43.0	47	55.0
	mm	178	216	254	305	457	584	711	813	889	991	1092	1194	1397
L2	in	11.5	13.0	14.0	17.0	22.0	26.0	31.0	33.0	35.0	39.0	43.0	47	55.0
	mm	292	330	356	432	556	660	787	838	889	991	1092	1194	1397
L3	in	11.62	13.12	14.12	17.12	22.12	26.12	31.12	33.12	35.12	39.12	43.12	47.25	55.38
	mm	295	333	359	435	562	664	791	841	892	994	1095	1200	1406
H	in	23.2	24.8	26.3	36.0	42.5	49.9	59.5	70.5	73.1	85.1	88.6	97.2	118.1
	mm	590	629	667	914	1080	1267	1511	1791	1857	2162	2251	2470	3000
W	in	7.9	9.8	9.8	11.8	19.7	22.0	27.2	35.8	24.0	24.0	24.0	24.0	30.0
	mm	200	250	250	300	500	560	690	610	610	610	610	610	760
L	in	–	–	–	–	–	–	–	17.0	17.0	20.2	20.2	20.2	21.8
	mm	–	–	–	–	–	–	–	432	432	512	512	512	554
WEIGHT	LB	16.3	26.3	31.7	55.3	113.4	183.7	294.8	390.0	562.4	639.5	1005.9	1274.8	1780.5
	Kg	36	58	70	122	250	405	650	860	1240	1410	2218	2811	3926

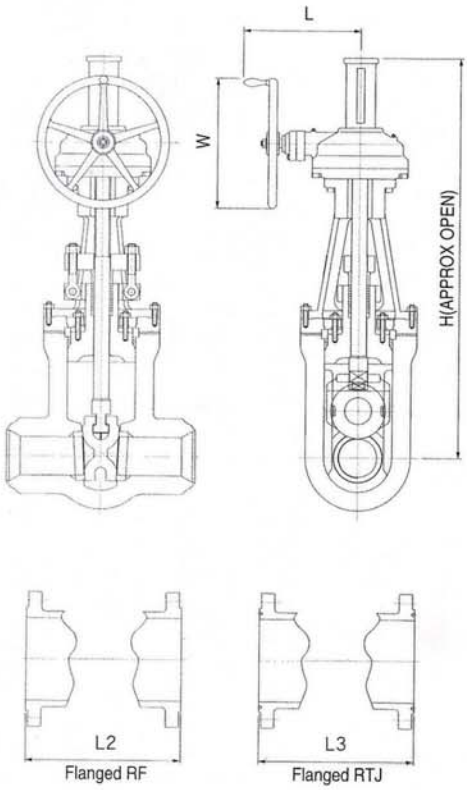
■ GT ASME 900LB

VALVE SIZE		2	2.5	3	4	6	8	10	12	14	16	18	20	24
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600
L1	in	8.5	10.0	12.0	14.0	20.0	26.0	31.0	36.0	39.0	43.0	46.5	50.5	59.5
	mm	216	254	305	356	508	660	787	914	991	1092	1181	1283	1511
L2	in	14.5	16.5	15.0	18.0	24.0	29.0	33.0	38.0	40.5	44.5	48.0	52.0	61.0
	mm	368	419	381	457	610	737	838	965	1029	1130	1219	1321	1549
L3	in	14.62	16.62	15.12	18.12	24.12	29.12	33.12	38.12	40.88	44.88	48.5	52.5	61.75
	mm	371	422	384	460	612	740	841	968	1038	1140	1232	1333	1568
H	in	23.4	29.6	29.8	34.0	39.9	50.2	60.7	70.1	79.8	89.0	97.2	108.3	127.6
	mm	594	753	756	864	1013	1276	1543	1781	2026	2261	2470	2750	3242
W	in	11.8	17.7	17.7	19.7	22.0	18.1	24.0	24.0	24.0	24.0	29.9	29.9	24.0
	mm	300	450	450	500	560	460	610	610	610	610	760	760	610
L	in	–	–	–	–	–	16.8	17.0	20.2	20.2	20.2	21.8	21.8	20.1
	mm	–	–	–	–	–	427	432	512	512	512	554	554	512
WEIGHT	LB	132.3	207.3	224.9	330.8	617.4	1455.3	2116.8	2976.8	3748.5	5292	7320.6	9702.0	14927.9
	Kg	60	94	102	150	280	660	960	1350	1700	2400	3320	4400	6770

GT ASME 1500LB · GT ASME 2500LB

PRESSURE SEAL BONNET





■ GT ASME 1500LB

VALVE SIZE												
	in	2	2.5	3	4	6	8	10	12	14	16
	mm	50	65	80	100	150	200	250	300	350	400
L 1	in	8.5	10.0	12.0	16.0	22.0	28.0	34.0	39.0	42.0	47.0
	mm	216	254	305	406	559	711	864	991	1067	1194
L 2	in	14.5	16.5	18.5	21.5	27.75	32.75	39.0	44.5	49.5	54.5
	mm	368	419	470	546	705	832	991	1130	1257	1384
L 3	in	14.62	16.62	18.62	21.62	28.0	33.13	39.38	45.12	50.25	55.38
	mm	371	422	473	549	711	841	1000	1146	1276	1406
H	in	23.4	29.6	29.6	34.0	48.0	51.6	64.8	77.8	87.2	91.8
	mm	594	753	753	864	1219	1311	1645	1975	2216	2331
W	in	11.8	17.7	17.7	19.7	24.0	24.0	24.0	24.0	29.9	29.9
	mm	300	450	450	500	610	610	610	610	760	760
L	in	–	–	–	–	17.0	17.0	20.2	20.0	21.8	21.8
	mm	–	–	–	–	432	432	512	512	554	554
WEIGHT	LB	132.3	207.3	264.6	458.6	1058.4	2006.6	3109.1	4586.4	5755.1	7933
	Kg	60	94	120	208	480	910	1410	2080	2610	3600

■ GT ASME 2500LB

VALVE SIZE													
	in	2	2.5	3	4	6	8	10	12	14	16	18
	mm	50	65	80	100	150	200	250	300	350	400	450
L 1	in	11.0	13.0	14.5	18.0	24.0	30.0	36.0	41.0	44.0	49.0	55.0
	mm	279	330	368	457	610	762	914	1041	1118	1245	1397
L 2	in	17.75	20.0	22.75	26.50	36.0	40.25	50.0	56.0	–	–	–
	mm	451	508	578	673	914	1022	1270	1422	–	–	–
L 3	in	17.87	20.25	23.0	26.88	36.5	40.87	50.88	56.88	–	–	–
	mm	454	514	584	683	927	1038	1292	1445	–	–	–
H	in	23.4	29.6	29.6	34.3	47.3	57.1	63.4	82.5	90.2	97.2	116.1
	mm	594	753	753	870	1201	1451	1610	2096	2291	2470	2950
W	in	14.0	17.7	19.7	23.6	24.0	24.0	24.0	29.9	29.9	24.0	24.0
	mm	355	450	500	600	610	610	610	760	760	610	610
L	in	–	–	–	–	17.0	20.2	20.2	21.8	21.8	20.2	20.2
	mm	–	–	–	–	432	512	512	554	554	512	512
WEIGHT RF	lb	169	268	327	689	1607	2619	4710	6786	–	–	–
	kg	77	122	149	312	729	1188	2137	3078	–	–	–
WEIGHT BW	lb	99	179	188	377	1032	1468	3175	5952	6746	8333	9921
	kg	45	81	86	171	468	666	1440	2700	3060	3780	4500

CAST STEEL GLOBE VALVES

PRESSURE SEAL BONNET

YOKE SLEEVE

The standard material of the Yoke Sleeve is Nodular Ni-resist D2 with over 1150°C(2100F) dissolution point in conformity with API Std. specifications.

BONNET

The bonnet is of a steel forging identical to the body to insure high reliability. The bonnet has a perfect body-bonnet seal and both ease of dismantling and reassembly are ensured. The body and bonnet of our valves are carefully machined to achieve perfect coaxiality and eliminate any misalignment which may cause damaged stems.

STEM

The stem, of one-piece construction, is heat treated to secure the adequate mechanical properties and surface, hardness.
Accurate machining and grinding insure that there is minimized friction during valve opening/shutting. The round head of the stem gives a point contact with the inside of the disc housing and thus prevents galling.

BACK SEAT

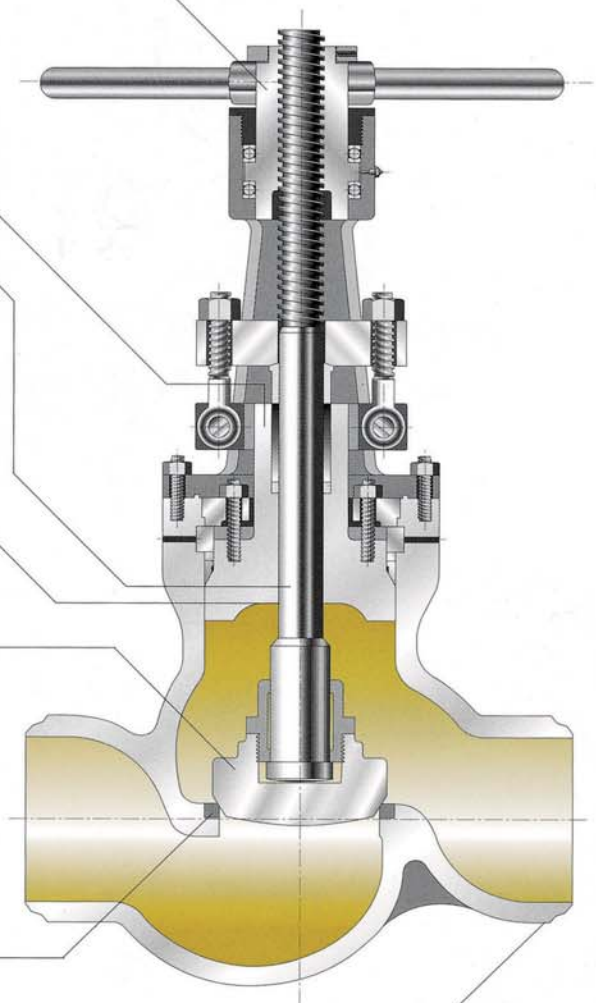
All of our valves are equipped with a backseat to allow packing replacement with the valve fully opened. The conical shape contact seat in the bonnet assembly in integrally stellite faced.

DISC

The disc of our globes is a loose disc which freely revolves around the stem, thereby preventing friction and galling with the seating surface when the valve is shut. The outside diameter of the disc is accurately finished and cylindrical on shape to travel along the body guides. A stellite 6 layer is applied to the conical seating surface of the disc. The deposit Undergoes a special heat treatment to secure the required hardness and soundness. In addition, the lapped finish insures a perfect mating with the seats.

SEAT

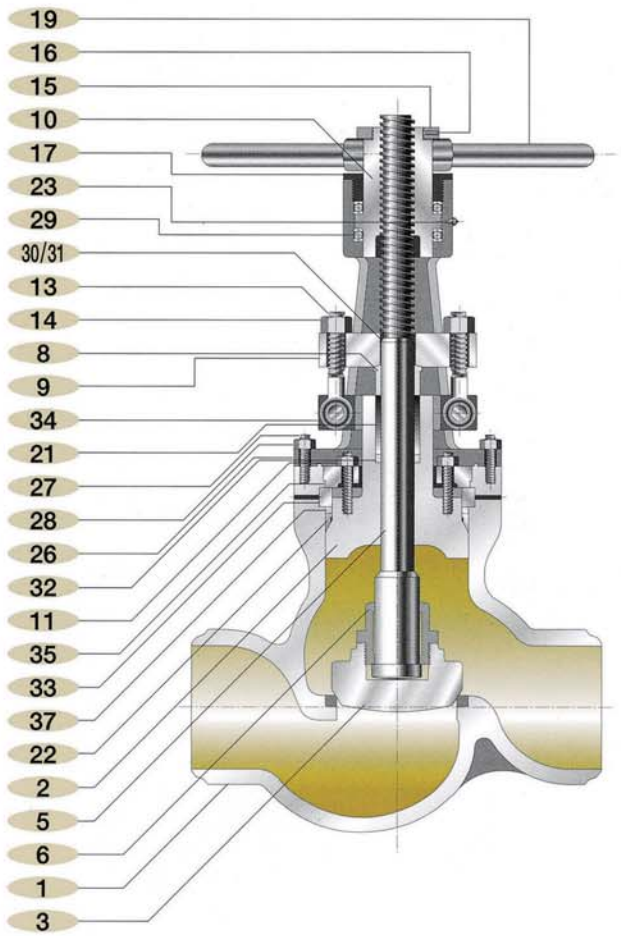
The Stellite 6 seating surface is intergrally applied to the body by means of welding in all valve sizes. Perfect mating of the disc surfaces is achieved by lapping applied to the seating surface.



BODY

The cylindrically shaped valve body prevents distortion or undue stress undue stress under extreme working conditions. In addition, adequate padding ensures a sound cast structure in the critical areas. The wall thickness is greater than, or in accordance with API, ANSI and ASME requirements. The area contacting the pressure seal gasket has a stainless steel 18/8 inlay to eliminate corrosion or wire drawing. The close tolerances of the inside diameter of this area are attained by accurate machining and honing finish.

CAST STEEL
PRESSURE SEAL BONNET



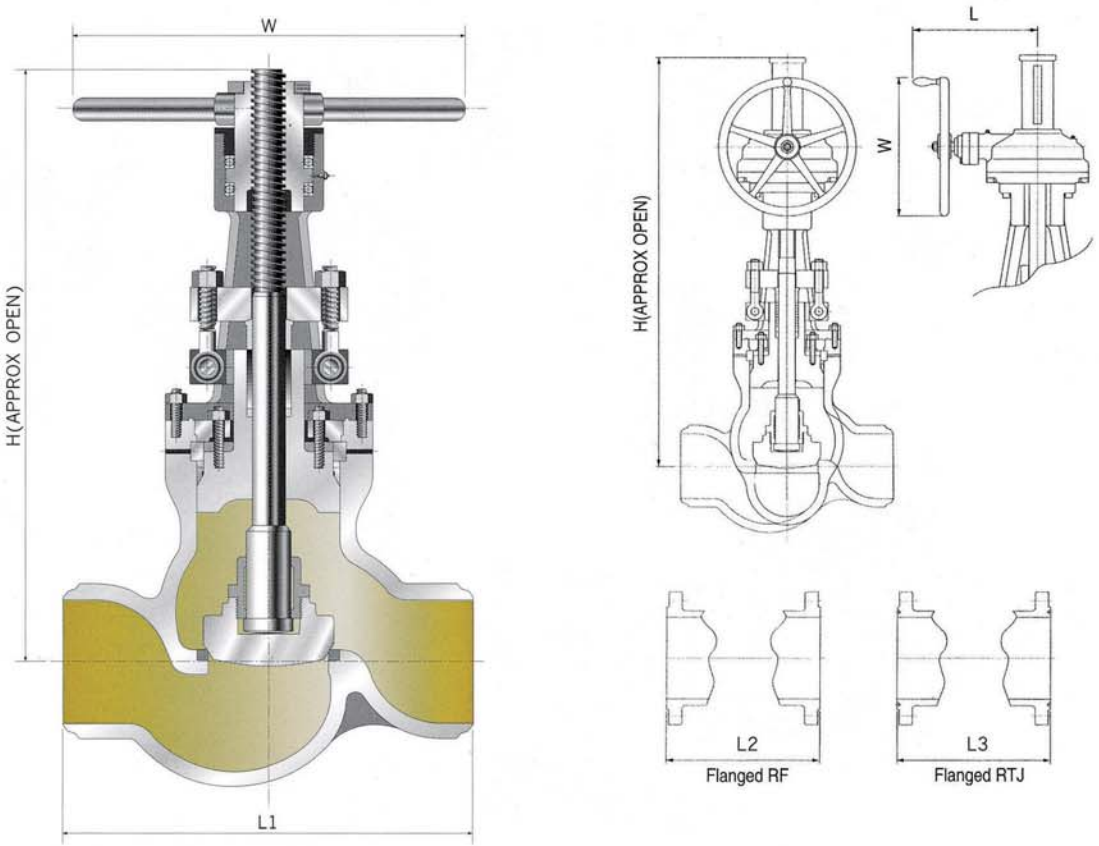
NO	NAME OF PART	ASTM SPECIFICATION
15	HANDLE NUT	STEEL
16	SET SCREW	STEEL
19	HANDWHEEL	A395
21	PACKING	COMMERCIAL
22	GASKET	COMMERCIAL
30	STOPPER	A283-D

NO	NAME OF PART	ASTM SPECIFICATION						
		STANDARD	HIGH TEMPERATURE SERVICE				LOW TEMPERATURE SERVICE	
1	BODY	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
2	BONNET	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
3	*DISC	A217-CA15	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
5	STEM	A182-F6a	A182-F6a	A182-F6a	A182-F6a	A182-F6a	A182-F304	A182-F304
6	DISC GLAND	A217-CA15	A217-CA15	A217-CA15	A217-CA15	A217-CA15	A182-F304	A182-F304
8	PACKING GLAND	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
9	GLAND FLANGE	A105	A105	A105	A105	A105	A105	A105
10	YOKE SLEEVE	A439-D2C	A439-D2C	A439-D2C	A439-D2C	A439-D2C	A439-D2C	A439-D2C
11	BONNET FLANGE BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A320-L7	A320-L7
13	GLAND BOLT	A193-B7	A193-B7	A194-B7	A194-B7	A194-B7	A320-L7	A320-L7
14	GLAND NUT	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-4	A194-4
26	YOKE	A216-WCB	A216-WC1	A216-WC6	A216-WC9	A216-C5	A352-LCB	A352-LC1/LC2/LC3
27	YOKE BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A320-L7	A320-L7
28	YOKE NUT	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-4	A194-4
31	STOPPER PIN	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
32	PACKING WASHER	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
33	RETAINER	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
34	HINGE CLAMP	A216-WCB	A216-WC1	A216-WC6	A216-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
35	BONNET CLAMP	A216-WCB	A216-WC1	A216-WC6	A216-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
37	GASKET SPACER	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304

*Note : In case of 6″ and larger size, we'll use trim material overlayed one on the same or equivalent material of the Body.

GL ASME 600LB · GL ASME 900LB

PRESSURE SEAL BONNET



■ GL ASME 600LB

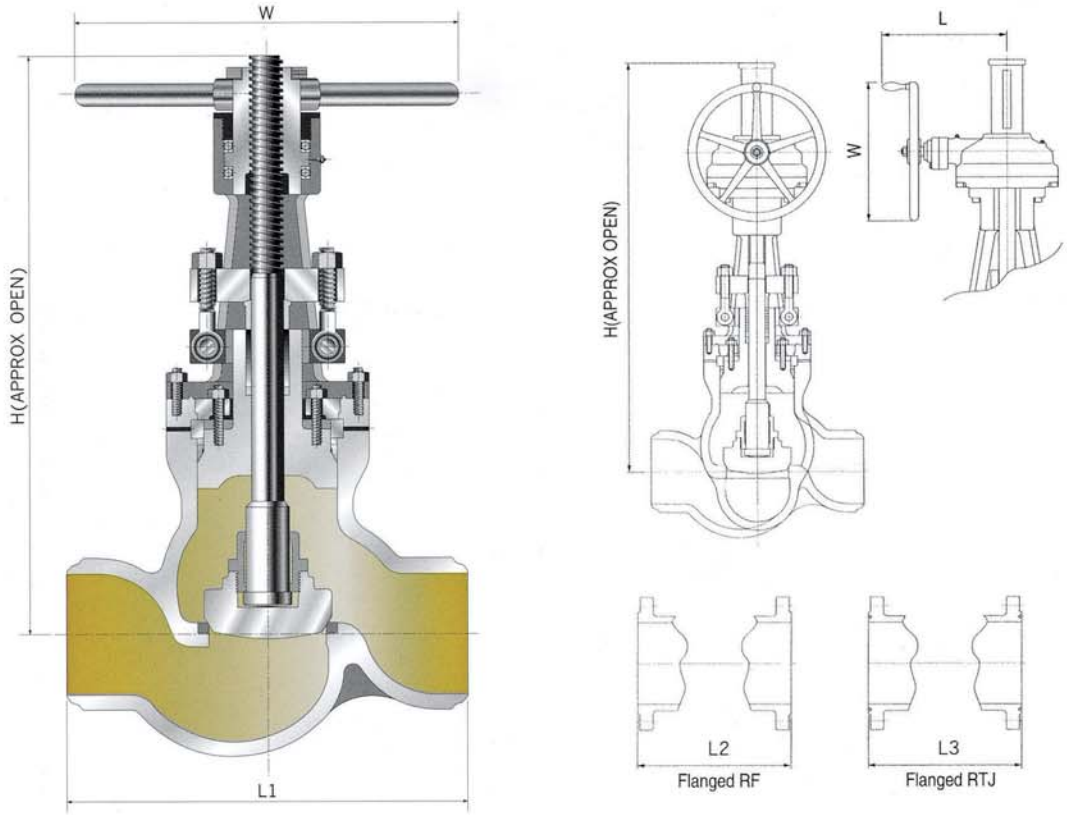
VALVE SIZE		2	2.5	3	4	6	8	10	12	14	16
	in	50	65	80	100	150	200	250	300	350	400
L1	in	7.0	8.5	10.0	12.0	18.0	23.0	28.0	32.0	35.0	39.0
	mm	178	216	254	305	457	584	711	813	889	991
L2	in	11.5	13.0	14.0	17.0	22.0	26.0	31.0	33.0	35.0	39.0
	mm	292	330	356	432	559	660	787	818	889	991
L3	in	11.62	13.12	14.12	17.12	22.12	26.12	31.12	33.12	35.12	39.12
	mm	295	333	359	435	562	664	792	841	892	994
H	in	21.7	24.8	26.8	29.5	453	49.2	55.1	61.0	70.9	85.0
	mm	550	630	680	750	1150	1250	1400	1550	1800	2160
W	in	9.8	11.8	11.8	17.7	23.6	18.1	24.0	24.0	24.0	29.9
	mm	250	300	300	450	600	460	610	610	610	760
L	in	–	–	–	–	–	20.2	17.0	20.2	20.2	22.3
	mm	–	–	–	–	–	512	432	512	512	567
WEIGHT	LB	99.2	121.2	187.4	297.7	672.5	1367.1	2888.6	4189.5	5997.6	6945.8
	Kg	45	55	85	135	305	620	1310	1900	2720	3150

■ GL ASME 900LB

VALVE SIZE		2	2.5	3	4	6	8	10	12	14	16
	in	50	65	80	100	150	200	250	300	350	400
L1	in	8.5	10.0	12.0	14.0	20.0	26.0	31.0	36.0	39.0	43.0
	mm	216	254	305	356	508	660	787	914	991	1092
L2	in	14.5	16.5	15.0	18.0	24.0	29.0	33.0	38.0	40.5	44.5
	mm	368	419	381	457	610	737	838	965	1029	1130
L3	in	14.62	16.62	15.12	18.12	24.12	29.12	33.12	38.12	4088	44.88
	mm	371	422	384	460	613	740	841	968	1038	1140
H	in	24.4	25.3	28.4	33.5	48.2	53.1	61.0	68.9	78.7	90.9
	mm	619	641	721	850	1225	1350	1550	1750	2000	2310
W	in	15.7	15.7	15.7	19.7	24.0	24.0	24.0	24.0	29.9	29.9
	mm	400	400	400	500	610	610	610	610	760	760
L	in	–	–	–	–	20.2	17.0	20.2	20.2	22.3	22.3
	mm	–	–	–	–	512	432	512	512	567	567
WEIGHT	LB	176.4	242.6	231.5	374.9	926.1	2205.0	3792.6	5071.5	7386.8	8820.0
	Kg	80	110	105	170	420	1000	1720	2300	3350	4000

GL ASME 1500LB · GL ASME 2500LB

PRESSURE SEAL BONNET



■ GL ASME 1500LB

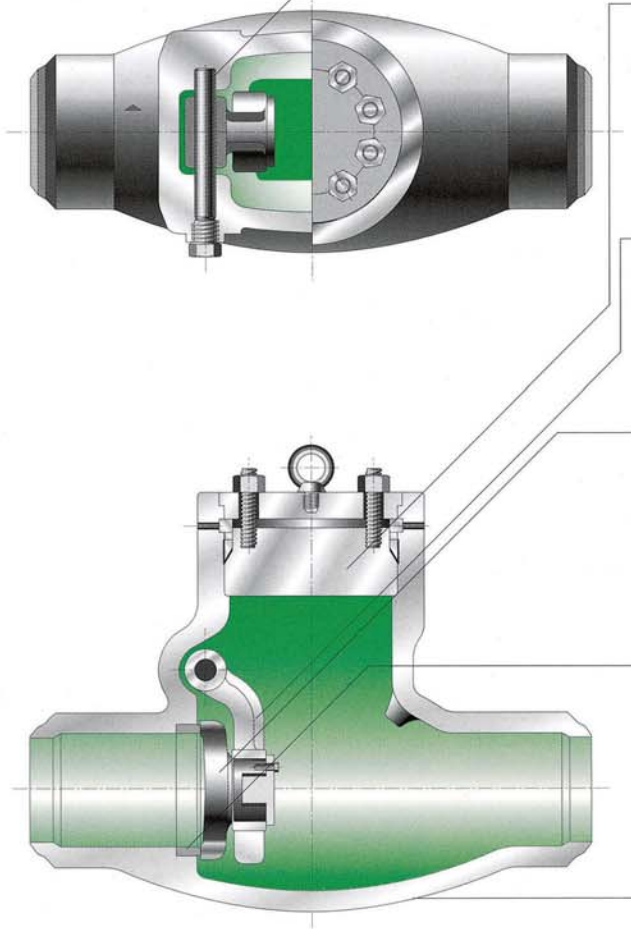
VALVE SIZE		2	2.5	3	4	6	8	10	12	14
	mm	50	65	80	100	150	200	250	300	350
L 1	in	8.5	10.0	12.0	16.0	22.0	28.0	34.0	39.0	42.0
	mm	216	254	305	406	559	711	864	991	1067
L 2	in	14.5	16.5	18.5	21.5	27.75	32.75	39.0	44.5	49.5
	mm	368	419	470	546	705	832	991	1130	1257
L 3	in	14.62	16.62	18.62	21.62	28.0	33.13	39.38	45.12	50.25
	mm	371	422	473	549	711	841	1000	1146	1276
H	in	24.4	25.2	32.9	33.7	48.4	70.9	78.7	91.0	105.9
	mm	619	641	835	857	1230	1800	2000	2311	2691
W	in	15.7	15.7	19.7	19.7	24.0	24.0	29.9	29.9	29.9
	mm	400	400	500	500	610	610	760	760	760
L	in	–	–	–	–	20.2	20.2	20.2	20.2	22.3
	mm	–	–	–	–	512	512	512	512	567
WEIGHT	LB	176.4	242.6	299.9	496.1	1433.3	3704.4	5909.4	7497	9481.5
	Kg	80	110	136	225	650	1680	2680	3400	4300

■ GL ASME 2500LB

VALVE SIZE		2	2.5	3	4	6	8	10	12
	mm	50	65	80	100	150	200	250	300
L 1	in	11.0	13.0	14.5	18.0	24.0	30.0	36.0	41.0
	mm	279	330	368	457	610	762	914	1041
L 2	in	17.75	20.0	22.75	26.50	36.0	40.25	50.0	56.0
	mm	451	508	578	673	914	1022	1270	1422
L 3	in	17.87	20.25	23.0	26.88	36.5	40.87	50.88	56.88
	mm	454	514	584	683	927	1038	1292	1445
H	in	24.3	30.7	31.5	51.2	53.9	85.0	100.0	106.0
	mm	616	781	800	1300	1370	2160	2540	2692
W	in	15.7	19.7	19.7	24.0	24.0	29.9	29.9	29.9
	mm	400	500	500	610	610	760	760	760
L	in	–	–	–	20.2	17.0	22.3	22.3	22.3
	mm	–	–	–	512	432	567	567	567
WEIGHT RF	lb	198	308	417	992	2480	4762	6548	8333
	kg	90	140	189	450	1125	2160	2970	3780
WEIGHT BW	lb	139	218	126	315	855	1800	2250	2970
	kg	63	278	694	1885	3968	4960	6548	

CAST STEEL SWING CHECK VALVES

PRESSURE SEAL COVER



• HINGE PIN

The hinge pin is inserted into the valve body to achieve pressure seal construction.

• COVER

The cover material is a steel forging identical to the body to insure high dependability.

The cover construction has a perfect body-cover tightness and ease of dismantling and reassembly are ensured.

• ARM

The arm is of a steel material identical to the body.

Larger sized valves are provided with a hinge bushing to reduce friction and to prevent galling.

• DISC

The disc has a sufficient seating surface area which is ground and lapped to a mirror finish.

It is of one-piece construction and is heat treated to deliver the required mechanical properties and hardness.

• SEAT RING

The Stellite 6 surface of the seat ring is integrally applied to the body by means of welding in all valve sizes.

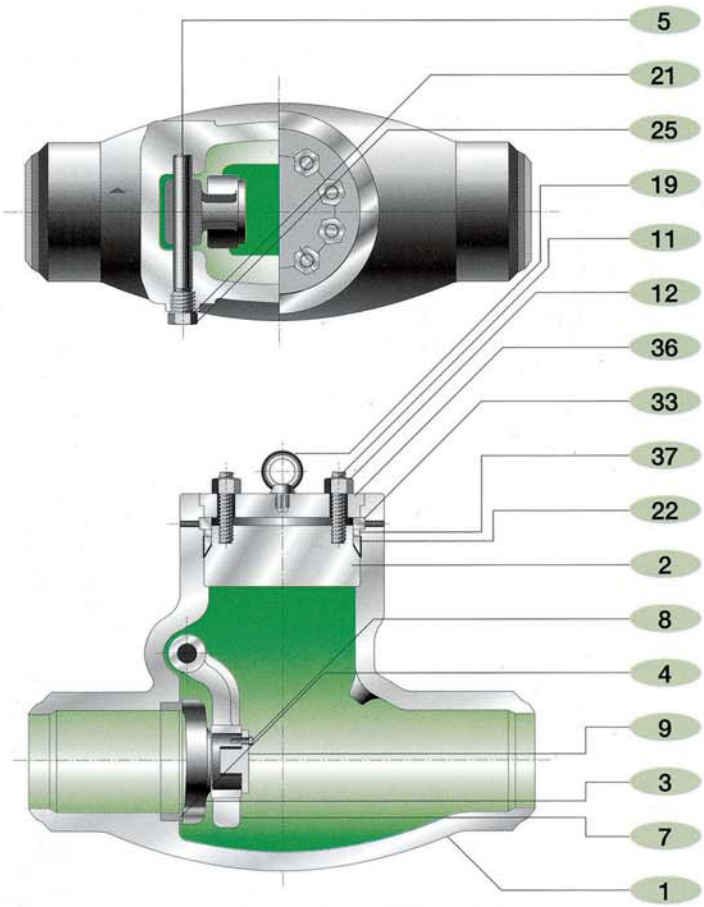
Perfect mating with the DISC surfaces attained by a lapping finish applied to the seating.

• BODY

The cylindrically shaped valve body prevents distortion or undue stress under extreme working conditions. Padding is also provided to achieve a sound cast structure in the critical areas. The wall thickness is greater than, or in accordance with, API,ANSI and ASME requirements. The area contacting the pressure seal gasket has a stainless steel 18/8 inlay to eliminate corrosion or wire drawing.

The close tolerances of the inside diameter of this area are attained by accurate machining and honing finish.

CAST STEEL
PRESSURE SEAL COVER



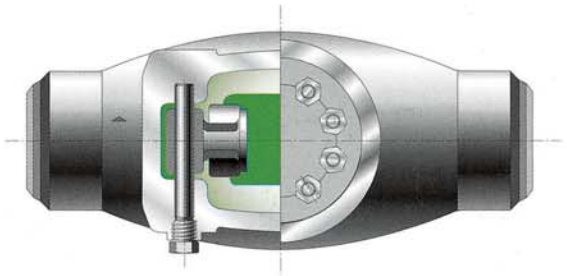
NO	NAME OF PART	ASTM SPECIFICATION
8	SET BOLT	AISI 304
9	DISC COVER	AISI 304
19	EYE BOLT	A 105
21	PLUG GASKET	COMMERCIAL
22	GASKET	COMMERCIAL

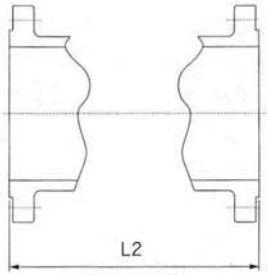
NO	NAME OF PART	ASTM SPECIFICATION						
		STANDARD	HIGH TEMPERATURE SERVICE				LOW TEMPERATURE SERVICE	
1	BODY	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
2	COVER	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
3	*DISC	A217-CA15	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
4	BODY SEAT RING	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A105+HARD FACE	A182-F304	A182-F304
5	HINGE PIN	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
7	ARM	A216-WCB	A217-WC1	A216-WC6	A217-WC9	A216-C5	A352-LCB	A352-LC1/LC2/LC3
11	BONNET BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A320-L7	A320-L7
12	BONNET NUT	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-4	A194-4
25	PLUG	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-4	A194-4
33	RETAINER	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
36	BONNET CLAMP	A216-WCB	A216-WC1	A216-WC6	A216-WC9	A217-C5	A352-LCB	A352-LC1/LC2/LC3
37	GASKET SPACER	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304

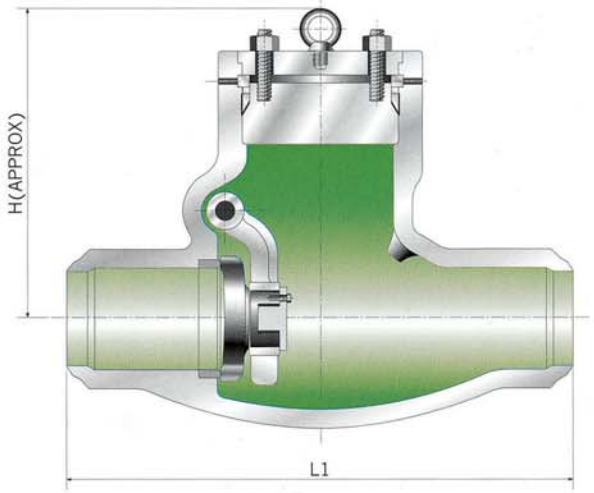
*Note : In case of 6" and larger size, we'll use trim material overlayed one on the same or equivalent material of the Body.

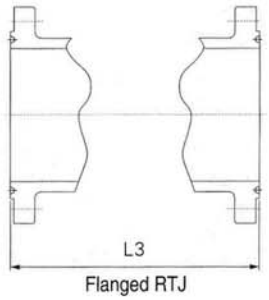
SW/CH ASME 600LB · SW/CH ASME 900LB

PRESSURE SEAL COVER









■ SW / CH ASME 600LB

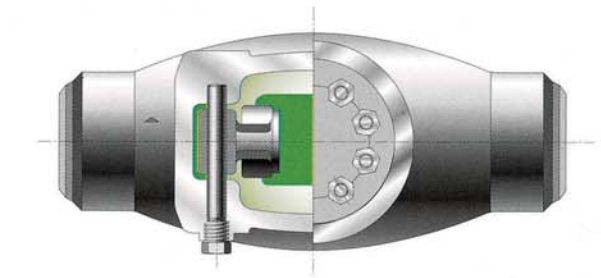
VALVE SIZE														
	in	2	2.5	3	4	6	8	10	12	14	16	18	20	24
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600
L1	in	7.0	8.5	10.0	12.0	18.0	23.0	28.0	32.0	35.0	39.0	43.0	47.0	55.0
	mm	178	216	254	305	457	584	711	813	889	991	1092	1194	1397
L2	in	11.5	13.0	14.0	17.0	22.0	26.0	31.0	33.0	35.0	39.0	43.0	47.0	55.0
	mm	292	330	356	432	559	660	787	838	889	991	1092	1194	1397
L3	in	11.62	13.12	14.12	17.12	22.12	26.12	31.12	33.12	35.12	39.12	43.12	47.25	55.38
	mm	295	333	359	435	562	664	791	841	892	994	1095	1200	1407
H	in	9.5	10.4	10.6	12.5	15.7	23.1	23.9	27.4	29.5	28.7	28.7	32.2	37.4
	mm	241	264	270	318	400	587	606	695	749	730	730	819	949
WEIGHT	LB	59.5	77.2	99.2	187.4	419.0	771.8	1102.5	1477.4	1940.4	2535.8	3263.4	4145.4	5733
	Kg	27	35	45	85	190	350	500	670	880	1150	1480	1880	2600

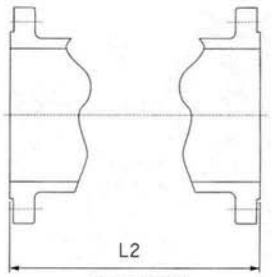
■ SW / CH ASME 900LB

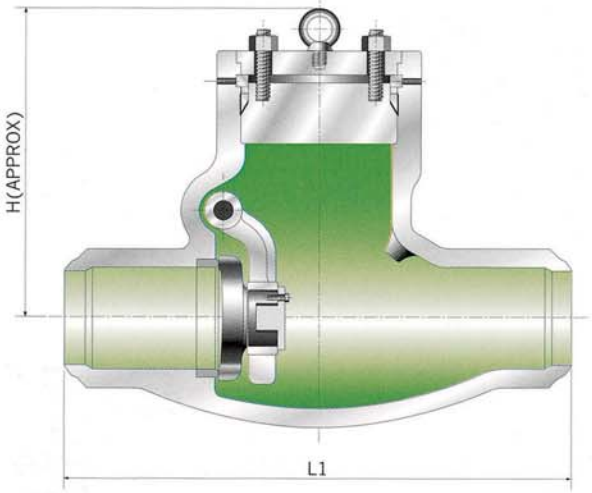
VALVE SIZE											
	in	2	2.5	3	4	6	8	10	12	14	16
	mm	50	65	80	100	150	200	250	300	350	400
L1	in	8.5	10.0	12.0	14.0	20.0	26.0	31.0	36.0	39.0	43.0
	mm	216	254	305	356	508	660	787	914	991	1092
L2	in	14.5	16.5	15.0	18.0	24.0	29.0	33.0	38.0	40.5	44.5
	mm	368	419	381	457	610	737	838	965	1029	1130
L3	in	14.62	16.62	15.12	18.12	24.12	29.12	33.12	38.12	40.88	44.88
	mm	371	422	384	460	613	740	841	968	1038	1140
H	in	9.5	10.4	10.6	12.5	15.7	23.1	23.9	27.4	29.5	28.7
	mm	241	264	270	318	400	587	606	695	749	730
WEIGHT	LB	88.2	121.3	114.7	231.5	507.2	1256.9	1874.3	2866.5	3417.8	3638.3
	Kg	40	55	52	105	230	570	880	1300	1550	1650

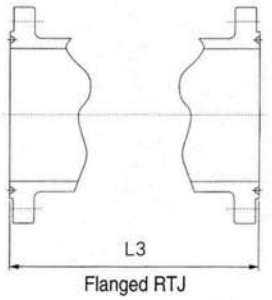
SW/CH ASME 1500LB · SW/CH ASME 2500LB

PRESSURE SEAL COVER









■ SW/CH ASME 1500LB

VALVE SIZE										
	in	2	2.5	3	4	6	8	10	12	14
	mm	50	65	80	100	150	200	250	300	350
L1	in	8.5	10.0	12.0	16.0	22.0	28.0	34.0	39.0	42.0
	mm	216	254	305	406	559	711	864	991	1067
L2	in	14.5	16.5	18.5	21.5	27.75	32.75	39.0	44.5	49.5
	mm	368	419	470	546	705	832	991	1130	1257
L3	in	14.62	16.62	18.62	21.62	28.0	33.13	39.38	45.12	50.25
	mm	371	422	473	549	711	841	1000	1146	1276
H	in	9.5	10.4	10.6	12.5	15.7	18.9	23.3	25.4	28.0
	mm	241	264	270	318	400	479	591	645	711
WEIGHT	LB	88.2	121.3	220.5	308.7	882.0	1345.1	2315.3	3417.8	4630.5
	Kg	40	55	100	140	400	610	1050	1550	2100

■ SW/CH ASME 2500LB

VALVE SIZE												
	in	2	2.5	3	4	6	8	10	12	14	16	18
	mm	50	65	80	100	150	200	250	300	350	400	450
L1	in	11.0	13	14.5	18.0	24.0	30.0	36.0	41.0	44.0	49.0	55.0
	mm	279	330	368	457	610	762	964	1041	1118	1245	1397
L2	in	17.75	20.0	22.75	26.5	36.0	40.25	50.0	56.0	62.0	68.0	–
	mm	451	508	578	673	914	1022	1270	1422	1575	1727	–
L3	in	17.87	20.25	23.0	26.88	36.5	40.87	50.88	56.88	–	–	–
	mm	454	514	584	683	927	1038	1292	1445	–	–	–
H	in	9.6	10.4	10.6	12.5	15.7	22.0	24.8	27.5	33.9	35.4	39.4
	mm	245	264	270	318	400	559	629	699	860	899	1000
WEIGHT RF	lb	169	234	308	565	1488	2679	4266	5952	8294	10040	14842
	kg	77	106	140	257	675	1215	1935	2700	3762	4554	6732
WEIGHT BW	lb	99	139	169	327	913	1786	2579	3571	4861	6349	8036
	kg	45	63	77	149	414	810	1170	1620	2205	2880	3645

CONFORMANCE STANDARDS

HAWKS VALVES CONFORM TO THE FOLLOWING STANDARDS AS APPLICABLE TO CUSTOMER REQUIREMENTS.

API Spec 6D Latest Edition	: API Specification for Pipeline Valves
API Standard 598 Latest Edition	: Valve Inspection and Test
API Standard 600 Latest Edition	: Steel Gate Valves, Flanged and Butt-welding Ends
API Standard 603 Latest Edition	: Class 150, Cast Corrosion-Resistant Flanged-End Gate Valves
API Standard 605 Latest Edition	: Large-Diameter Carbon Steel Flanges
ANSI B16.5 Latest Edition	: Steel Pipe Flanges and Flanged Fittings
ANSI B16.10 Latest Edition	: Face-to-Face and End-to-End Dimensions of Ferrous Valves
ANSI B16.25 Latest Edition	: Butt-welding Ends
ANSI B16.34 Latest Edition	: Valves-Flanged, Threaded, And Welding End
MSS Standard Practice SP-6 Latest Edition	: Standard Finishes for Contact Faces of Pipe Flanges and Connecting-End Flanges of Valves and Fittings
MSS Standard Practice SP-25 Latest Edition	: Standard Marking System for Valves, Fittings, Flanges and Unions
MSS Standard Practice SP-44 Latest Edition	: Steel Pipe Line Flanges
MSS Standard Practice SP-45 Latest Edition	: By-Pass and Drain Connection Standard
BS 1414 Latest Edition	: Steel wedge gate valves(flange and butt-welding ends)
BS 1868 Latest Edition	: Steel check valves(flange and butt-welding ends)
BS 1873 Latest Edition	: Steel globe and globe stop and check valves(flange and butt-welding ends)
BS 5352 Latest Edition	: Steel wedge gate, globe and check valves(50mm & smaller)
BS 6364 Latest Edition	: Valve for cryogenic service
JIS B2003 Latest Edition	: General Rules for Inspection of Valves
JIS B2201 Latest Edition	: Pressure Ratings for Ferrous Material Pipe Flanges
JIS B2203 Latest Edition	: Tolerances for Pipe Flanges
JIS B2210 Latest Edition	: Basic Dimensions of Ferrous Material Pipe Flanges
JIS B2071 Latest Edition	: 10kgf/㎠ Cast Steel Flanged Globe Valves
JIS B2073 Latest Edition	: 10kgf/㎠ Cast Steel Flanged Gate Valves(Outside Screw Type)
JIS B2074 Latest Edition	: 10kgf/㎠ Cast Steel Flanged Swing Check Valves
JIS B2081 Latest Edition	: 20kgf/㎠ Cast Steel Flanged Globe Valves
JIS B2083 Latest Edition	: 20kgf/㎠ Cast Steel Flanged Gate Valves(Outside Screw Type)
JIS B2084 Latest Edition	: 20kgf/㎠ Cast Steel Flanged Swing Check Valves
JPI 7S-15 Latest Edition	: Steel Pipe Flanges for The Petroleum Industry
JPI 7S-23 Latest Edition	: Ring Joint Gaskets and Grooves for Petroleum Industry
JPI 7S-24 Latest Edition	: Standard Marking System for valves
JPI 7S-39 Latest Edition	: Valve Inspection and Test
JPI 7S-46 Latest Edition	: Cast Steel Flanged Valves for the Petroleum Industry(Class 150,300)
JPI 7S-47 Latest Edition	: Cast Steel Valves for the Petroleum Industry, Flanged or Butt-welding Ends (Class600 to 2500)
API	: American Petroleum Institute
ANSI	: American National Standards Institute
ASTM	: American Society for Testing and Materials
ASME	: American Society of Mechanical Engineers
ASS	: Manufacturers Standardization society of the Valve and Fitting Industry
BS	: British Standards Institution
JIS	: Japanese Industrial Standards
JPI	: Japan Petroleum Institute
NACE	: National Association of corrosion Engineers
AWS	: American welding Society

VALVE WALL THICKNESS

(API 603 ANSI B16.34)

• LIGHT WALL

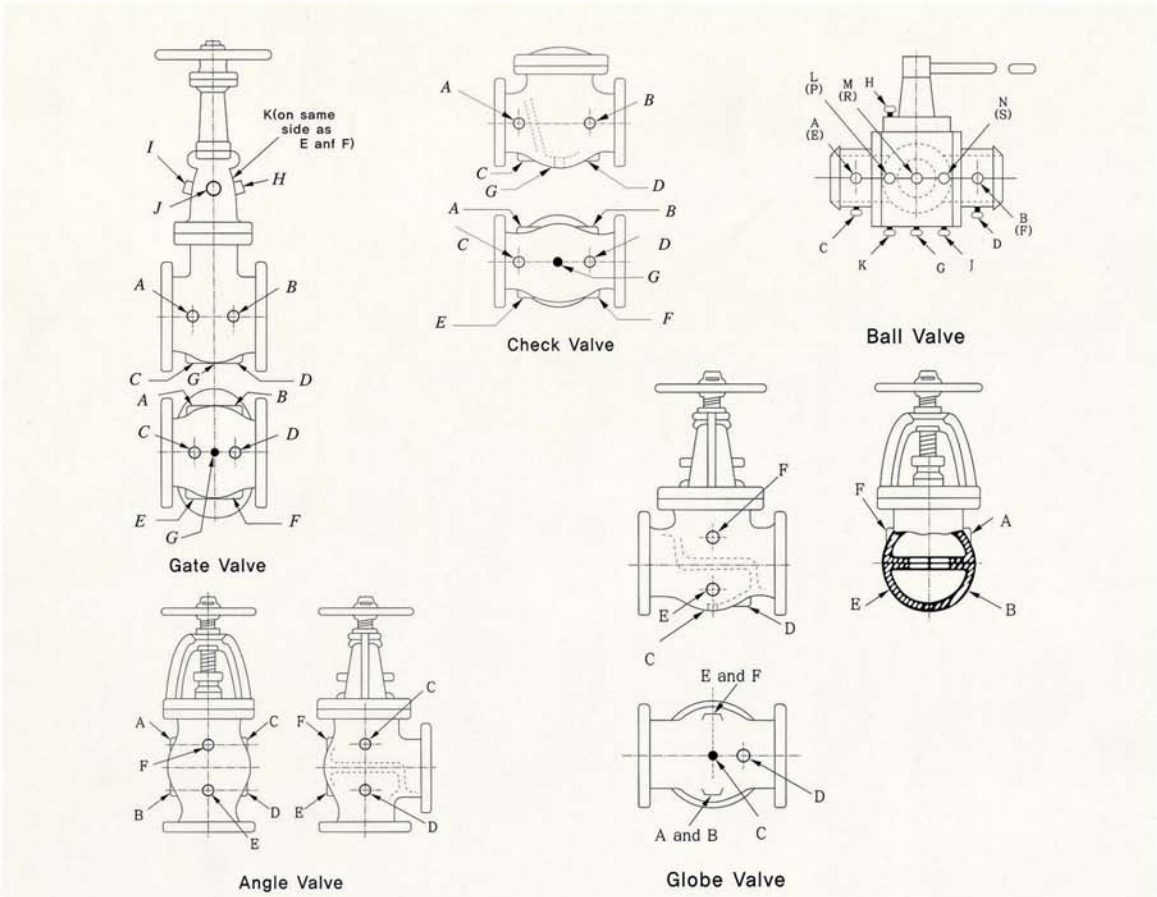
NOMINAL SIZE		RATINGS											
		150#		300#		600#		900#		1500#		2500#	
		INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM
½	15	0.11	3.0	0.12	3.1	0.13	3.4	0.16	4.1	0.19	4.8	0.25	6.3
¾	20	0.12	3.1	0.15	3.8	0.16	4.1	0.18	4.6	0.23	5.8	0.29	7.4
1	25	0.16	4.1	0.19	4.8	0.19	4.8	0.22	5.6	0.26	6.6	0.35	8.9
1¼	32	0.19	4.8	0.19	4.8	0.19	4.8	0.25	6.4	0.31	7.8	0.44	11.2
1½	40	0.19	4.8	0.19	4.8	0.22	5.6	0.28	7.1	0.38	9.6	0.50	12.7
2	50	0.22	5.6	0.25	6.4	0.25	6.4	0.31	7.9	0.44	11.2	0.62	15.8
2½	65	0.22	5.6	0.25	6.4	0.28	7.1	0.34	8.6	0.50	12.7	0.75	19.0
3	80	0.22	5.6	0.28	7.1	0.31	7.9	0.41	10.4	0.62	15.7	0.88	22.4
4	100	0.25	6.4	0.31	7.8	0.38	9.6	0.50	12.7	0.75	19.0	1.09	27.7
5	125	0.28	7.1	0.38	9.6	0.44	11.2	0.59	15.0	0.91	23.1	1.34	34.0
6	150	0.28	7.1	0.38	9.6	0.50	12.7	0.72	18.3	1.09	27.7	1.59	40.4
8	200	0.31	8.1	0.44	11.2	0.62	15.8	0.88	22.4	1.41	35.8	2.06	52.3
10	250	0.34	8.6	0.50	12.7	0.75	19.0	1.06	26.9	1.72	43.7	2.59	65.8
12	300	0.38	9.6	0.56	14.2	0.91	23.1	1.25	31.8	2.00	50.8	3.03	77.0
14	350	0.41	10.4	0.62	15.8	0.97	24.6	1.38	35.0	2.19	55.6	3.34	84.8
16	400	0.44	11.2	0.69	17.5	1.09	27.7	1.56	39.6	2.50	63.5	3.81	96.8
18	450	0.47	11.9	0.75	19.0	1.22	31.0	1.75	44.4	2.81	71.4	4.27	108.5
20	500	0.50	12.7	0.81	20.6	1.34	34.0	1.91	48.5	3.12	79.2	4.69	119.1
24	600	0.57	14.5	0.94	23.9	1.59	40.4	2.28	57.9	3.72	94.5	5.72	145.3

(API 600)

• HEAVY WALL

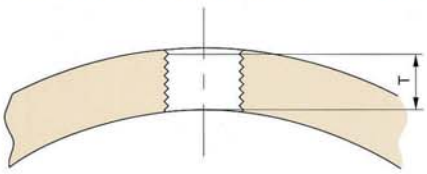
NOMINAL SIZE		RATINGS											
		150#		300#		600#		900#		1500#		2500#	
		INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM
½	15	-	-	-	-	-	-	-	-	-	-	-	-
¾	20	-	-	-	-	-	-	-	-	-	-	-	-
1	25	0.25	6.4	0.25	6.4	0.31	7.9	0.50	12.7	0.50	12.7	0.59	15.0
1¼	32	0.25	6.4	0.25	6.4	0.34	8.6	0.56	14.2	0.56	14.2	0.69	17.5
1½	40	0.25	6.4	0.31	7.9	0.37	9.4	0.59	15.0	0.59	15.0	0.75	19.1
2	50	0.34	8.6	0.38	9.7	0.44	11.2	0.75	19.1	0.75	19.1	0.88	22.4
2½	65	0.38	9.7	0.44	11.2	0.47	11.9	0.88	22.4	0.88	22.4	1.00	25.4
3	80	0.41	10.4	0.47	11.9	0.50	12.7	0.75	19.1	0.94	23.9	1.19	30.2
4	100	0.44	11.2	0.50	12.7	0.63	16.0	0.84	21.3	1.13	28.7	1.41	35.8
5	125	-	-	-	-	-	-	-	-	-	-	-	-
6	150	0.47	11.9	0.63	16.0	0.75	19.1	1.03	26.2	1.50	38.1	1.91	48.5
8	200	0.50	12.7	0.69	17.5	1.00	25.4	1.25	31.8	1.88	47.8	2.44	62.0
10	250	0.56	14.2	0.75	19.1	1.13	28.7	1.44	36.6	2.25	57.2	2.66	67.6
12	300	0.63	16.0	0.81	20.6	1.25	31.8	1.66	42.2	2.63	66.8	3.41	86.6
14	350	0.66	16.8	0.88	22.4	1.38	35.1	1.81	46.0	2.75	69.9	-	-
16	400	0.69	17.5	0.94	23.9	1.50	38.1	2.06	52.3	3.13	79.5	-	-
18	450	0.72	18.3	1.00	25.4	1.63	41.4	2.25	57.2	3.50	88.9	-	-
20	500	0.75	19.1	1.06	26.9	1.75	44.5	2.50	63.5	3.88	98.6	-	-
24	600	0.81	20.6	1.19	30.2	2.00	50.8	2.88	73.2	4.50	114.3	-	-

Auxiliary Connection to ANSI B16.34



GENERAL NOTE
The above sketches represent valves with symmertrical shapes Sketches are iliustrative only and do not imply design.

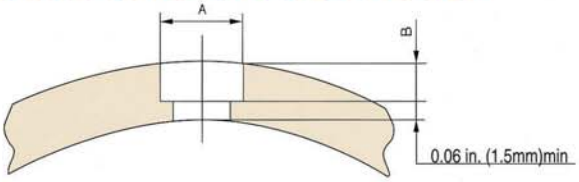
METHOD OF DESIGNATING LOSATION OF AUXILIARY CONNECTIONS WHEN SPECIFED



Conn Size NPS	3/8	1/2	3/4	1	11/4	11/2	2
Lengtn of Thread. T.[Note(1)]							
in	0.41	0.53	0.55	0.68	0.71	0.72	0.76
mm	11	14	14	18	18	19	20

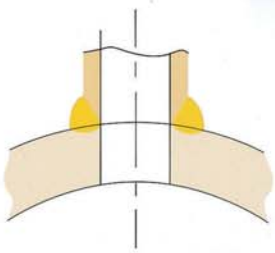
NOTE :
(1)In no case shall the effective length, T, be less than shown in table above These lengths are equal to the effective theard lengths of American Nationsl Exlernal Pipe Threads(Ans1821)

THREAD LENGTH FOR AUXILIARY CONNECTIONS

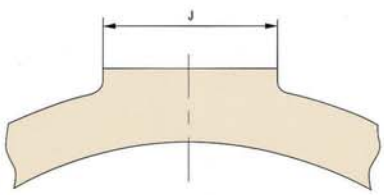


Conn, Size, NPS	3/8	1/2	3/4	1	11/4	11/2	2
Min. Dia of Socket, A							
in	0.690	0.855	1.065	1.330	1.675	1.915	2.406
mm	17.5	22	27	34	43	49	61
Min. Dia of Socket, B							
in	0.19	0.19	0.25	0.25	0.25	0.25	0.31
mm	5	5	6.5	6.5	6.5	6.5	8

SOCKET WELDING FOR AUXILIARY CONNECTIONS



BUTTWELDING FOR AUXILIARY CONNECTIONS



Conn Size NPS	3/8	1/2	3/4	1	11/4	11/2	2
Lengtn of Thread. T.[Note(1)]							
in	0.41	0.53	0.55	0.68	0.71	0.72	0.76
mm	11	14	14	18	18	19	20

BOSSES FOR AUXILIARY CONNECTIONS

JIS-ASTM Material Comparison List

UNS DESIGNATION	GRADE	BAR		CASTING		FORGING	
		JIS	ASTM	JIS	ASTM	JIS	ASTM
		G 4303	A276	G 5121	A 351	G 3214	A 182
	AUSTENITIC STEELS						
S20910	22Cr-12Ni5Mn-2Mo-Cb-V-N-0.04C		XM-19		CG6MMN		F XM-19
S21800	17Cr-8.5Mo-8Mn-4Si-N-0.08C		—		CF102MnN		
S21904	20Cr-6.5Ni-9Mn-N-0.08C		XM-11				F XM-11
S24000	18Cr-3Ni-13Mn-N-0.06C		XM-29				
S24100	18Cr-1.5Ni-13Mn-N-0.1C		XM-28				
JIS	17Cr-7Ni-0.1C		SUS 301				
S30200	18Cr-8Ni-0.1C	SUS 302	302	SCS 12	(A743 CF-20)		(A473 302)
JIS	18Cr-8Ni-0.06C	SUS 304		SCS 13		SUS F 304	
S30400	18Cr-8Ni-0.06C	SUS 304	304	SCS 13A	CF8, 8A	SUS F 304	F304
JIS	18Cr-9Ni-Lo, C	SUS 304L		SCS 19		SUS F 304L	
S30403	18Cr-9Ni-Lo, C	SUS 304L	304L	SC519A	CF3, 3A	SUS F 304L	F304L
S30409	18Cr-8Ni-0.07C		(A479 304H)		CF10	SUS F 304H	F304H
S30430	18Cr-9Ni-3.5Cu-0.06C	SUS XM7	XM-7				
S30451	18Cr-8Nii-0.15N-0.06C	SUS 304N1	304N				F304N
S30452	18Cr-8Ni-0.25N-0.06C	SUS 304N2	XM-21				
S30453	18Cr-9Ni-0.15N-0Lo, C	SUS 304LN	304LN				F304LN
—	18Cr-13Ni-0.06C	SUS 305J1					
S30600	18Cr-15Ni-4Si-0.009C						F46
S30800	20Cr-11Ni-0.06C		308		(A743 CG12)		(A473 308)
S30815	20Cr-10Ni-1.5Si-N-Ce-0.08C		—				F45
S30880	21Cr-10Ni-2Mn-Si-0.06C		ER308				
S30900	22Cr-12Ni-0.1C		309	SCS 17	CH20		(A473 309)
S30908	22Cr-12Ni-0.06C	SUS 309S	309S		CH8		(A473 309S)
S30909	22Cr-12Ni-0.07C				CH10		(A336 F 309H)
S30940	22Cr-12Ni-Cb-0.06C		309Cb				
S31000	25Cr-20Ni-0.1C		310	SCS 18	CK20	SUS F 310	F310
S31008	25Cr-20Ni-0.06C	SUS 310S	310S				(A473 310S)
S31040	25Cr-20Ni-Cb-0.06C		310Cb				
S31254	20Cr-18Ni-6.5Mo-N-Cu-0.01C		—		CK3MCuN		F44
S31400	25Cr-20Ni-2Si-0.15C		314				(A473 314)
JIS	18Cr-12Ni-2.5Mo-0.06C	SUS 316		SCS 14		SUS F 316	
S31600	18Cr-12Ni-2.5Mo-0.06C	SUS 316	316	SCS 14A	CF8M	SUS F 316	F316
JIS	18Cr-12Ni-2.5Mo-Lo, C	SUS 316L		SCS 16		SUS F 316L	
S31603	18Cr-12Ni-2.5Mo-Lo, C	SUS 316L	316L	SCS 16A	CF3M, 3MA	SUS F 316L	F316L
S31609	18Cr-12Ni-2.5Mo-0.07C		(A479 316H)		CF10M	SUS F 316H	F316H
S31635	18Cr-12Ni-2.5Mo-Ti-0.06C		316Ti				
S31640	18Cr-13Ni-2Mo-Cb-0.06C		316Cb	SCS 22	CF10MC		
S31651	18Cr-12Ni-2.5Mo-0.15N-0.06C	SUS 316N	316N				F316N
S31653	18Cr-12Ni-2.5Mo-0.15N-Lo, C	SUS 316LN	316LN		(A743 CF-3MN)		F316LN
S31654	18Cr-12Ni-2.5Mo-0.2N-Lo, C		—		(A-743 CF-3MN)		
JIS	18Cr-12Ni-2Mo-2Cu-0.06C	SUS 316J1		BCS 15			
JIS	18Cr-12Ni-2Mo-2Cu-Lo, C	SUS 316J1L		SCS 20			
S31700	18Cr-12Ni-3.5Mo-0.06C	SUS 317	317		CG8M		F317
S31703	18Cr-12Ni-3.5Mo-Lo, C	SUS 317L					F317L
S31725	18Cr-16Ni-5Mo-Lo, C	SUS 317L	—				
S32100	18Cr-9Ni-Ti-0.06C	SUS 321	321			SUS F 321	F321
S32109	18Cr-9Ni-Ti-0.07C		(A479 321H)			SUS F 321H	F321H
S33100	8Cr-20Ni-1Si-Mn-0.15C						F10
S34700	18Cr-9Ni-Cb-0.06C	SUS 347	347	SCS 21	CF8C	SUS F 347	F347
S34709	18Cr-9Ni-Cb-0.07C		(A479 347H)			SUS F 347H	F347H
S34800	18Cr-9Ni-Cb-0.06C		318				F348
JIS	18Cr-13Ni-4Si-0.06C	SUS XM15J1					
—	20Cr-24Ni-3Mo-2Cu-3Si-0.05C				(A743 CN-7MS)		
—	20Cr-29Ni-2.5Mo-3.5Cu-0.05C			SCS 23	CN7M		
—	20Cr-33Ni-Min-Si-Cb-0.01C				CT15C		
—	21Cr-24Ni-5Mo-Lo, C				(A743 CN-3M)		
—	25Cr-20Ni-0.3C				HK30		
—	25Cr-20Ni-0.4C				HK40		
	FERRITIC-AUSTENTIC STEELS						
S31100	25Cr-6Ni-0.04C		XM-26				
S31200	25Cr-6Ni-2Mo-N-Lo, C						F50
S31803	23Cr-6Ni-3Mo-N-Lo, C		—	SCS10			F51
—	25Cr-5Ni-2Mo-3Cu-0.02C				CD4MCu		
S32900	25Cr-4.5Ni-2Mo-0.06C	SUS 329J1		SCS11			

SPECIAL ALLOY STEEL

TAPE OF STEEL	GRADE	BAR		CASTING		FORGING	
		JIS	ASTM	JIS	ASTM	JIS	ASTM
Carpenter 20	Cr-Ni-Fe-Mo-Cu-Cb						
Alloy 20Cb-3	35Ni-20Cr-2.5Mo-39Fe-35Cu-Cb-0.05C		B 473 NO8020				B 462 NO8020
CN7M, SCS 23	29Ni-20Cr-2.5Mo-45Fe-35Cu-0.05C			G 5121 SCS 23	A 351 CN7N		
CN-7MS	24Ni-19Cr-2.5Mo-49Fe-2Cu-3Si-0.05C				A 743 CM-7MS		
Carpenter 20 Mod	Ni-Fe-Cr-Mo						
Alloy 20 Mod	26Ni-22Cr-5Mo-47Fe-Ti-0.03C		B 621 NO8320				B 621 NO8320
CN-3M	25Ni-21Cr-5Mo-49Fe-Lo, C				A 743 CM-3M		
Nickel	Ni						
Alloy 200	99Ni-0.1C	H 4562 NNCB	B 160 NO2200				B 160 NO2200
Alloy 201	99Ni-0.01C	H 4562 NLCB	B 160 NO2201				B 160 NO2201
CZ-100	97Ni-0.8C				A 494 CZ-100		
Duranickel 301	95Ni-4.5A1-Ti-0.2C	H 4562 NDB					
Monel	Ni-Cu						
Alloy 400	69Ni-31Cu-0.2C(Si<0.5) (S<0.024)	H4553 NCuB	B 164 NO4400				B 164 NO4400
Alloy 405	69Ni-31Cu-0.2C(Si<0.5) (S:0025-0.06)		B 164 NO4405				B 164 NO4405
M-35-1	70Ni-30Cu-0.25C(Si<1.25)				A 494 M-351		
M-35-2	70Ni-30Cu-0.25C(Si<2.00)				A 494 M-35-2		
N-30H	67Ni-31Cu-3Si-0.2C				A 494 M-30H		
M-25S	66Ni-30Cu-4Si-0.15C				A 494 M-25S		
M-30C	66Ni-30Cu-1.5Si-2Cb-0.2C				A 494 M-30C		
Inconel	Ni-Cr-Fe(NI-Cr-Mo-Cb)						
Alloy 600	77Ni-15Cr-8Fe-0.1C	G 4901 NCF 600	B 166 NO6600				B 564 NO6600
CY 40	77Ni-15Cr-(8Fe)-0.3C				A 494 CY-40		
Alloy 625	65Ni-22Cr-9Mo-4Cb-0.08C		B 446 NO6625				B 564 NO6625
CW-6MC	65Ni-22Cr-9Mo-4Cb-0.04C				A 494 CW-6MC		
Inconel 601	61Ni-23Cr-14Mo-1.5A1-0.08C	G 4901 NCF 601					
Inconel 690	62Ni-23Cr-9Fe-0.03C	B166 NO6690					
Inconel X-750	73Ni-16Cr-7Fe-1Cb-2.5Ti-A1-0.06C	G 4901 NCF 750	B 637 NO7750				B 637 NO7750
Inconel 751	73Ni-16Cr-7Fe-1Ni-2.5Ti-A1-0.08C	G 4901 NCF 751					
CY5SnBiM	76Ni-13Cr-3Mo-4Bi-4Sn-0.03C				A 494 CY5SnSim		
Incoloy	NiFe-Cr(Ni-Fe-Cr-Mo-Cu)						
Alloy 800	33Ni-21Cr-46Fe-A1-Ti-0.08C	G 4901 NCF 800	B 408 NO8800				B 564 NO8800
Alloy 800H	33Ni-21Cr-46Fe-A1-Ti-0.075C	G 4901 NCF 800H	B 406 NO8810				B 564 NO8810
Alloy 825	42Ni-22Cr-3Mo-30Fe-2Cu-1Ti-0.03C	G 4901 NCF 825	B 425 NO8825				B 425 NO8825
Hastelloy B	Ni-Mo						
Alloy B	67Ni-28Mo-5Fe-V-0.03C		B 335 N10001				B 335 N10001
A-12MV	67Ni-28Mo-5Fe-V-0.1C				A 494 N-12MV		
Alloy B-2	72Ni-28Mo-0.01C		B 335 N10665				B 335 N10665
N-7M	68Ni-32Mo-0.05C				A 494 N-7M		
Hastelloy C	Ni-Mo-Cr						
Alloy C-276	58Ni-16Cr-16Mo-6Fe-4W-0.005C		B 574 N10276				B 335 N10276
CW-12MW	58Ni-16Cr-16Mo-6Fe-4W-V-0.01C				A 494 CW-12MW		
Alloy C-4	68Ni-16Cr-16Mo-0.008C		B 574 NO6455				B 574 NO6455
CW-2M	68Ni-16Cr-16Mo-0.01C				A 494 CW-2M		
Alloy C-22	58Ni-21Cr-14Mo-4Fe-3W-0.008C		B 574 NO6022				B 574 NO6022
CW-6M	62Ni-19Cr-19Mo-0.05C				A 494 CW-6M		
Hastelloy G	Ni-Cr-Fe-Mo-Cu						
Alloy G	46Ni-22Cr-6.5Mo-20Fe-.5Mn-2Cu-0.03C		B 581 NO6007				B 581 NO6007
Alloy G-2	50Ni-25Cr-6Mo-17Fe-1Cu-1Ti-Lo, C		B 581 NO6975				B 581 NO6975
Alloy G-30	44Ni-30Cr-5Mo-15Fe-2Cu-1Cb-3W-Lo, C		B 581 NO6030				B 581 NO6030
Alloy G-3	49Ni-22Cr-7Mo-20Fe-2Cu-0.008C		B 581 NO6985				B 581 NO6985
Hastelloy N	Ni-Mo-Cr-Fe						
Alloy N	76Ni-7Cr-17Mo-0.06C		B 573 N10003				B 573 N10003
Hastelloy X	Ni-Cr-Mo-Fe						
Alloy X	48Ni-22Cr-9Mo-19Fe-1.5Co-W-0.1C		B 572 NO6002				B 572 NO6002
Js 700	Ni-Fe-Cr-9Mo-Cb						
Alloy 700	25Ni-21Cr-4.5Mo-49Fe-Cb-0.02C		B 581 NO8700				B 672 NO8700
CN-3M	25Ni-21Cr-5Mo-49Fe-Lo, C				A 743 CN-3M		
904L	Ni-Fe-Cr-Mo-Cu-Lo, C						
Alloy 904L	26Ni-21Cr-4.5Mo-47Fe-1.5Cu-0.01C		B 649 NO8904				B 649 NO8904
RA-330	Ni-Fe-Cr-Si						
Alloy 330	36Ni-19Cr-44Mo-1Si-0.06C		B 511 NO8330				B 511 NO8330
Nimonic 80A	Ni-Cr						
Nimonic 80A	76Ni-20Cr-2Ti-1.5A1-0.08C	G 4901 NCF 80A	B 637 NO7080				B 637 NO7080
IN-102	Ni-Cr-Fe-Cb-Mo-W						
IN-102	68Ni-15Cr-3Mo-7Fe-3Cb-3W-A1-Ti-Mg-B-Zr-0.06C		B 518 NO6102				
Affcorr	Ni-Cr-Mo-W						
ffcorr	55Ni-31Cr-10.5Mo-2.5W-Cb--0.1C		B 756 NO6110				B 564 NO6110
RA-333	Ni-Cr-Mo-Co-W-Fa-Si						
Alloy 333	46Ni-26Cr-3Mo-19Fe-3Co-3W-0.08C		B 719 NO6333				
AL-6X	Cr-Ni-Mo-Fe						
AL-6X	25Ni-21Cr-6.5Mo-47Fe-Lo, C		B 691 NO8366				
CN-3M	25Ni-21Cr-5Mo-49Fe-Lo, C						
AL-6XN	25Ni-21Cr-6.5Mo-47Fe-0.2N-o, C		B 691 NO8367				B 462 NO8357

ENGINEERING DATA

Chemical & Physical Properties

CASTING MATERIALS
CHEMICAL PROERTIES

	Carbon Steel	CA-15	High Temp.	High Temp.	HIGH	TEMP	304-S.S.	316-S.S.	HASTEL LOY-B	HASTEL LOY-C	304-L.S.S.	316L-S.S.	Low Temp	NICKEL	INCONEL	MONEL	A-20
ASTM Std	A-216	A-217	A-217	A-217	A-217	A-217	A-351	A-351	A-494	A-494	A-351	A-351	A-352	A-494	A-494	A-494	A-351
Grade	WCB	CA-48	WC6	WC9	C-5	C-12	CF8	CF8M	N-12M-1	CW-12M-1	CF3	CF3M	LCB	CZ-100	CY-40	M-35	CN-7M
C% MaX.	0.30	0.15	0.20	0.18	0.20	0.20	0.08	0.08	0.12	0.12	0.03	0.03	0.30	1.0	0.4	0.35	0.07
Min%	1.00 MAX.	1.00	0.05-0.08	0.40-0.70	0.40-0.70	0.35-0.65	1.50	1.50	1.00	1.0	1.50	1.50	1.00	1.5	1.5	1.5	1.5
P% MAX.	0.04	0.040	0.04	0.04	0.040	0.040	0.04	0.04	0.040	0.040	0.04	0.04	0.05	0.03	0.03	0.03	0.04
S% MAX.	0.045	0.040	0.045	0.045	0.045	0.045	0.04	0.04	0.030	0.030	0.04	0.04	0.06	0.03	0.03	0.03	0.04
Ni%	0.50	1.00	-	-	-	-	8.00	9.00	Balance	Balance	8.00-12.0	9.00-13.0	-	95.0 Min	Balance	Balance	27.5-30.5
Cr%	0.40	11.5-14.0	1.00-1.50	2.00-2.75	4.0-6.50	8.00-10.00	18.0-21.0	18.0-21.0	1.00	15.7-17.5	17.0-21.0	17.0-21.0	-	-	14-17.0	-	19.22
Mo%	0.25	-	0.45-0.65	0.90-1.20	0.45-0.65	0.90-1.20	-	2.00-3.00	26.0-30.0	16-18.0	-	2.00-3.00	-	-	-	-	2-3
Cu	0.0	-	-	-	-	-	-	-	-	0	-	-	-	1.25	-	26-33	3.4
Si	0.30	1.50	0.60	0.60	0.75	1.00	2.00	2.00	1.00	1.0	2.0	1.50	0.60	2.0	3.0	1.25	1.5
Fe	-	-	-	-	-	-	-	-4.0-6.0	4.5-6.0	-	-	-	-	3.0	11.0	3.5	-
V	-	-	-	-	-	-	-	-	0.20-0.60	0.2-0.4	-	-	-	-	-	-	-

PHYSICAL PROPERTIES

Tensile Strength Min. Kis	70	90-115	70	70	90-115	90-115	70	70	76	70	70	65	72	50	70	65	62
Mpa	485	621-493	485	485	621-793	621-793	485	185	525	485	485	450	495	345	485	450	425
Yield point Min. Kis	30	65	40	40	60	60	28	30	40	30	30	35	40	18	28	25	25
Mpa	205	448	275	275	414	414	195	205	275	205	205	240	275	125	195	170	170
Elongation in 2 inch (50mm) %Min	22	18	20	20	18	18	35	30	6	35	30	20	40	10.0	30.0	25.0	35.0
Reduction ot Area % min	35	30	35	35	35	35	-	-	-	-	-	35	-	-	-	-	-

WROUGHT MATERIALS
CHEMICAL PROERTIES

	11-13% Cr	Ductile	Carbon Steel	B-8F	321-S.S	304L-S.S	316L-S.S	304-L-S.S	316L-S.S	Hard Facing	Bolts	Nuts
ASTM Std	A-182	A-439	ASTM	A-320	A-182	A-182	A-182	A-182	A-182	KLS	A-193	A194
Grade	F6a	D2C	A-105	B-8F	F-321	F-304	F-316	F-304L	F-316L	HF-6R	B7	2H
C% MaX.	0.15	0.29	0.22-0.35	0.15	0.08	0.08	0.08	0.035	0.035	11.05	0.38-0.48	0.40
Si% MAX.	1.00	100.3.00	0.35	1.00	1.00	1.00	1.00	1.00	1.00	1.11	0.15-0.35	-
Min% MAX.	1.00	1.80-2.40	0.60-1.05	2.00	2.00	2.00	2.00	2.00	2.00	-	0.75-1.00	-
P% MAX.	0.04	0.08	0.04	0.20	0.030	0.04	0.04	0.040	0.040	-	0.04	0.04
S% MAX.	0.03	-	0.05	0.150-0.350	0.030	0.03	0.03	0.030	0.030	-	0.04	0.05
Ni%	0.05	21.0-24.0	-	8.00-10.00	9.00-12.00	8.0-11.0	10.0-14.0	8.00-13.00	10.00-15.00	-	-	-
Cr%	11.5-14.5	0.05	-	17.00-19.00	17.00Min	18.0-20.0	16.0-18.0	18.00-20.00	16.00-18.00	28.3	0.80-1.10	-
Mo%	-	-	-	-	-	-	2.00-3.00	-	2.00-3.00	-	0.15-0.25	-
Ti%	-	-	-	-	C%×5-0.60	-	-	-	-	-	-	-
Fi%	Bal	-	-	-	-	-	-	-	-	0.30	Bal	Bal
W%	-	-	-	-	-	-	-	-	-	4.20	-	-
Co%	-	-	-	-	-	-	-	-	-	Bal	-	-

PHYSICAL PROPERTIES

Tensile Strength Min. Kis	85	58	70	75	75	75	75	70	70	-	125	175
Mpa	586	400	483	517	517	517	517	483	483	-	862	-
Yield point Min. Kis	55	28	35	30	30	30	30	25	25	-	105	-
Mpa	379	193	248	207	207	207	207	172	172	-	724	-
Elongation in 2 inch (50mm) %Min	18	20	22	35	45	30	30	30	30	-	16	-
Reduction ot Area % min	35	45	30	50	50	50	50	50	50	-	50	-

Memo