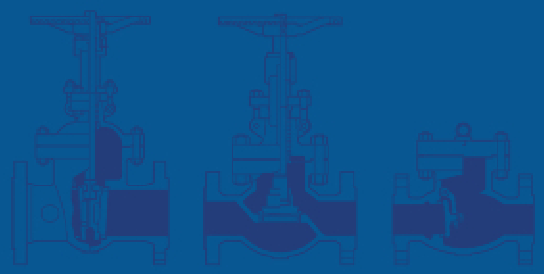

FLANGED & BUTTWELDING VALVES
CAST CARBON, ALLOY STEEL VALVES
STAINLESS STEEL VALVES

API 6D API 600

HAN KOOK VALVE Co., LTD
30, GOLDEN ROOT-RO 129BEON-GIL, JUCHON-MYEON, GIMHAE-SI, GYEONGNAM, KOREA
tel. 82-55-338-0966 fax. 82-55-338-0969, 82-55-338-0970
web. http://www.hkvalve.net e-mail. hkvalve@hkvalve.net

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2016.06 1K PRINTED IN KOREA

FLANGED & BUTTWELDING VALVES
CAST CARBON, ALLOY STEEL VALVES
STAINLESS STEEL VALVES

HANKOOK VALVE CO., LTD.

한국밸브주식회사

API 6D API 600

NO. HK012

GATE 300LB 64 Inch 34Ton Production. (Kwaite SABIYA PJT)

about us

HK valve, which is the company pursuing harmony between person and person, humans and nature.

This is Hankook Valve Co. Ltd., which is an enterprise pursuant of harmony of humans and nature as well as innovative one leading the world. We pursue harmonized management.

As initial of HK of our company name means kai key in Greek connecting harmony of Humans and nature, we at HK are committed to our contributions to humans and sustainable development through fulfillment of corporate and social responsibility. As such, we will continuously seek to learn in step with such development for harmony of humans and nature, and steadily improve our competitive edges.

We are now realizing No. 1 managemant and innovative management stunning the world. Along the way, we are committed as a representing brand of Korea leading the world. Based on that commitment, we are not settling for the present position and are continually rendering our best effort to prepare next stage and advance forward. HK, firmly built on the Frontier Spirit and Challenging as such, is anticipating a brighter future.

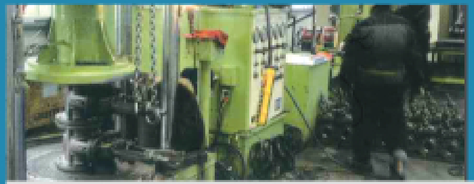
CNC 1.

CNC 2.

MCT

BORING MACHINE

LATHE



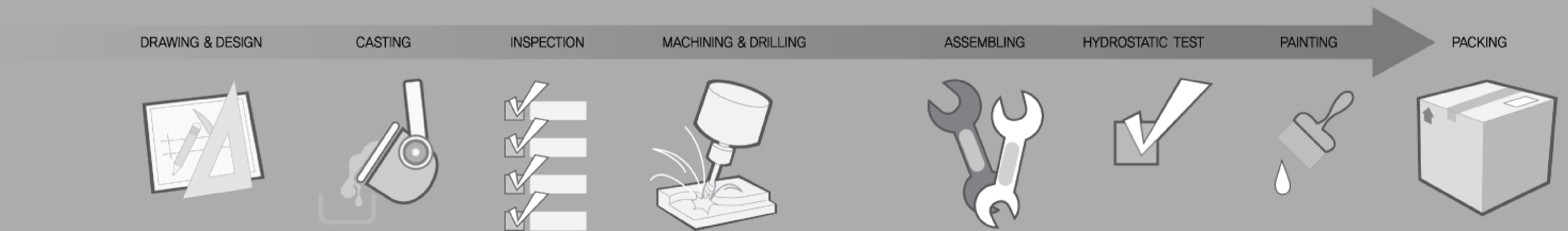
PRESSURE TEST M/C

We pursue value-oriented management based on harmony of humans along with nature earth. Shaking away from profit-oriented business pattern, we will seek our best to become a righteous enterprise to people all over the world who contact and come across us. We will suggest a new paradigm of harmony-oriented business by our steady pursuance to the cause and fulfillment of radical innovation in order to be a global leader amid rapidly changing business environment.

We look forward to your kind support and cooperation for our growth and implementation of our unique business style.

J.Y.Lee / President

manufacturing process



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history

1970	AUG. 1978	OEM PRODUCING OF HYUNDAI VALVE IND. CO., LTD.
1980	JUL. 01. 1985	ESTABLISHED AT 23-3 NAKMIN-DONG, DONGRAE-KU, PUSAN NAMED HAE KANG (VALVE) PRECISION CO.
	MAR. 1988	CHANGED THE NAME OF COMPANY TO HANKOOK VALVE GRANTED BY THE KOREAN GOVERNMENT AUTHORITIES AS KS (KOREAN INDUSTRIAL STANDARD) MARKED MANUFACTURER FOR CAST VALVE
1990	MAY. 1990	INSTALLED & STARTED COMMERCIAL PRODUCTION OF STAINLESS STEEL VALVES
	MAR. 1991	MOVED TO 622, SAMGYE-DONG, KIMHAE, KYUNGNAM
	JUL. 1994	LICENSED TO PRODUCE VALVE UNDER API(AMERICAN PETROLEUM INSTITUTE) 6D AND QI
	JUN. 1997	APPROVED AS CASTING VALVE MANUFACTURER FOR ISO 9002 BY ABS
	JUN. 1998	APPROVED AS CASTING VALVE MANUFACTURER FOR ISO 9001 BY QCB
	DEC. 1998	TURNED INTO LIMITED COMPANY
2000	JUN. 2001	MERGER WITH KOREA SPECIAL VALVE CO., LTD. AND MOVED TO 30-11, SUNJI-RI, JUCHON-MYUN, GIMHAE, KYUNGNAM, KOREA
	NOV. 2004	INCREASED CAPITAL
	NOV. 2005	AWARDED FOR OUTSTANDING EXPORT PERFORMANCE AS 3 MILLIAN USD
	NOV. 2006	AWARDED FOR OUTSTANDING EXPORT PERFORMANCE AS 5 MILLIAN USD
	APR. 2008	APPROVED AS CASTING VALVE MANUFACTURER FOR ISO 14001 BY SGS
	DEC. 2008	CERTIFIED AS VENTURE-COMPANY & INNO-BIZ COMPANY
2010	FEB. 2011	EXTENSION OF 2 BUILDINGS FOR WARE HOUSE
	APR. 2011	CERTIFIED AS PARTS AND MATERIALS MANUFACTURERS
	OCT. 2011	ESTABLISHMENT OF CORPORATE R&D CENTER
	OCT. 2012	EXTENDED AND MOVED TO PRESENT LOCATION IN GOLDEN ROOT INDUSTRIAL COMPLEX
2012	NOV. 2012	AWARDED FOR OUTSTANDING EXPORT PERFORMANCE AS 10 MILLIAN USD

certificate


Certificate of Authority to use the Official API Monogram

American Petroleum Institute


Certificate of Authority to use the Official API Monogram

American Petroleum Institute


DOOSAN

2015년도 우수 협력사

The Supplier of the Year

한국밸브 주식회사 HAN KOOK VALVE CO.,LTD

귀사는 두산중공업의 협력사로서 혁신활동을 통하여 우수한 품질의 제품을 적기에 공급하여 당사의 GLOBAL 경쟁력 강화에 기여하였으므로 2015년 우수협력사로 선정하여 본 인증서를 드립니다.

In recognition of total business performance, you are classified as The Supplier of the Year 2015.

2016. 3.

두산중공업

대표이사 부회장 정 지 택

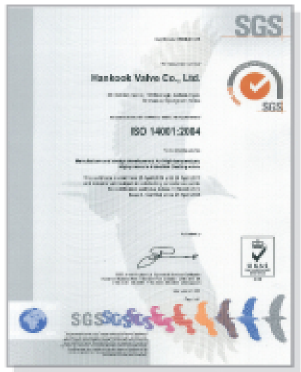

제 품 인 증 서

한국표준협회장


SGS

Hankook Valve Co.,Ltd.

ISO 9001:2008


SGS

Hankook Valve Co., Ltd.

ISO 14001:2004


SGS

Hankook Valve Co., Ltd.

OHSAS 18001:2007


기자재공급자 등록증


CERTIFICATE

HAN KOOK VALVE CO., LTD.

INTERNATIONAL QUALITY CROWN AWARD LONDON 2012

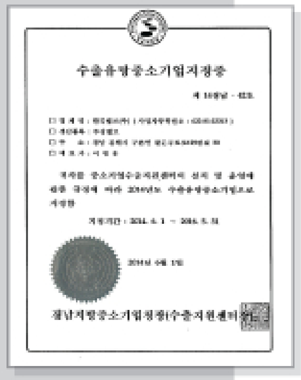

기업부설연구소 인정서

한국산업기술진흥협회장

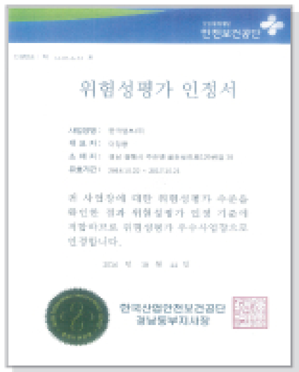

경영혁신형 중소기업(MAIN-BIZ) 확인서

2015 년 11 월 25 일

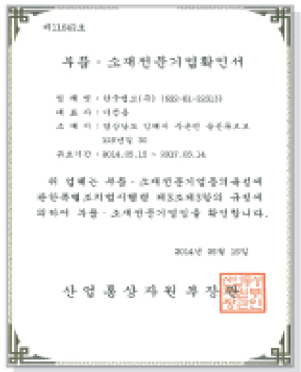
중 소 기 업 청 장


수출유망중소기업지정증

경남지방중소기업청장(수출지원센터장)


위험성평가 인정서

한국산업안전보건공단 경남동부지사장


부품·소재전문기업확인서

산 업 통 상 자 원 부 장 관


표 창 장

FIGURE NUMBER CODING

FIGURE NUMBER CODING CHART example / FIGURE NUMBER AIBA – AH
GATE VALVE CLASS 150, BOLTED BONNET, OS & Y, RAISED FACE 13%CR HANDWHEEL.

B	CONSN TYPE
B	BB
P	PSB

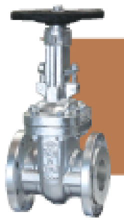
A	VALVE TYPE
A	GATE
B	GLOBE
C	SWING CHECK

I	PRESSURE
1	CLASS 150
2	CLASS 300
3	CLASS 600
4	CLASS 900
5	CLASS 1500
6	CLASS 2500
7	10K
8	20K
9	30K
10	40K
11	63K

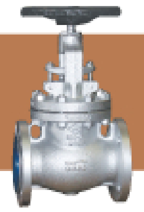
B	FLAT FACE
A	FLAT FACE
B	RASISED FACE
C	LARGE MALE
D	SMALL MALE
E	LARGE FEMALE
F	SMALL FEMALE
G	LARGE TONGUE
H	SMALL TONGUE
J	LARGE GROOVE
K	SMALL GROOVE
L	RTJ
M	BUTTWELDING ENDS

A	BODY MATERIAL		
A	A216-WCB	N	A352–LCB
B	A351-CF8	P	A217-C5
C	A351-CF8M	Q	A217-C12
D	A351-CF3	R	SCPH-2
E	A351-CF3M	S	SCS-13
F	A351-CN7M	T	SCS-14
G	A217-WC1	U	SCS-16
H	A217-WC6	V	SCS-19
J	A217-WC9	W	SCPL 1
K	A352-LCC	X	SCPL 21
L	A352-LC2	Y	SCPL 31
M	A352-LC3		

GATE VALVE



GLOBE VALVE



SWING CHECK VALVE

A	TRIM MATERIAL		
A	13% CR	E	316L
B	304	F	317
C	316	G	HF
D	304L	H	FULL

H	OPREATION		
H	HANDWHEEL	P	PNEUMATIC
C	CHAIN	E	ELECTRIC
G	GEAR	L	LEVER

MAIN PRODUCTION ITEMS

GATE VALVES

ASME		150	300	600	900	1500	2500
	BB	2″-76″	2″-64″	2″-48″	2½″-24″	2½″-24″	-
	PB	-	-	-	2½″-24″	2½″-24″	2½″-24″

KS	10K	20K	30K	40K	63K
	50-1050A	50-1050A	50-1050A	50-600A	50-400A

GLOBE VALVES

ASME		150	300	600	900	1500	2500
	BB	2″-24″	2″-32″	2″-16″	2″-16″	2″-14″	-
	PB	-	-	-	2″-14″	2″-14″	2″-14″

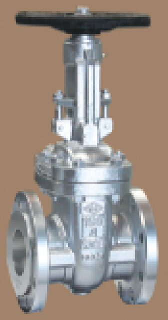
KS	10K	20K	30K	40K	63K
	50-600A	50-800A	50-800A	50-350A	50-350A

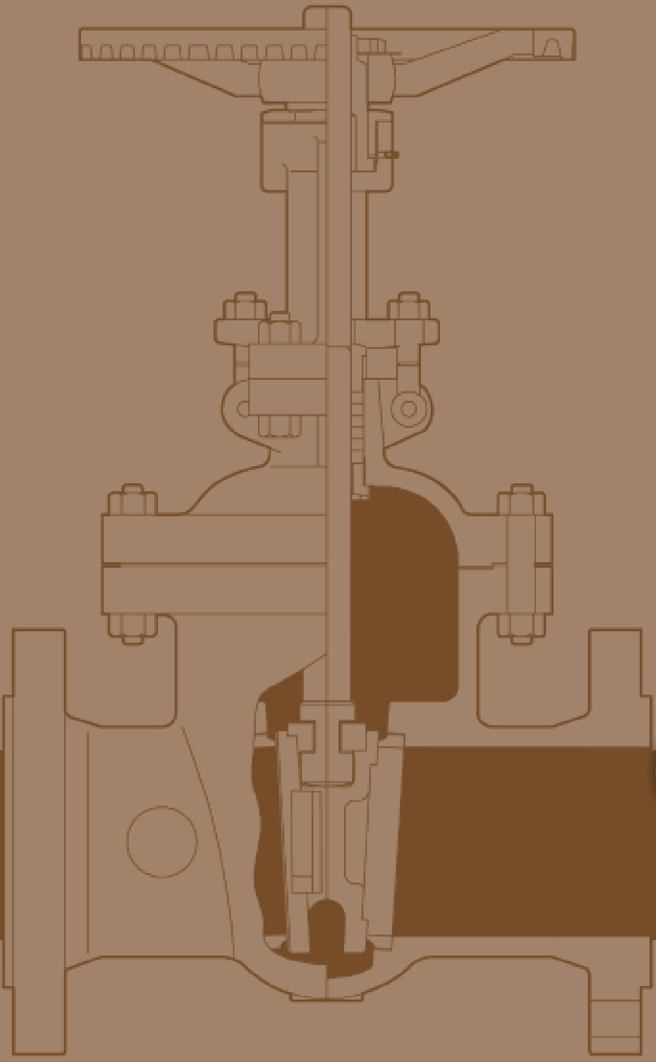
CHECK VALVES

ASME		150	300	600	900	1500	2500
	BB	2″-36″	2″-28″	2″-24″	2½″-16″	2½″-14″	-
	PB	-	-	-	2″-24″	2″-20″	2″-16″

KS	10K	20K	30K	40K	63K
	50-900A	50-700A	50-700A	50-600A	50-600A

Other Valves not listed here can also be manufactured depending on the customer's requirements.



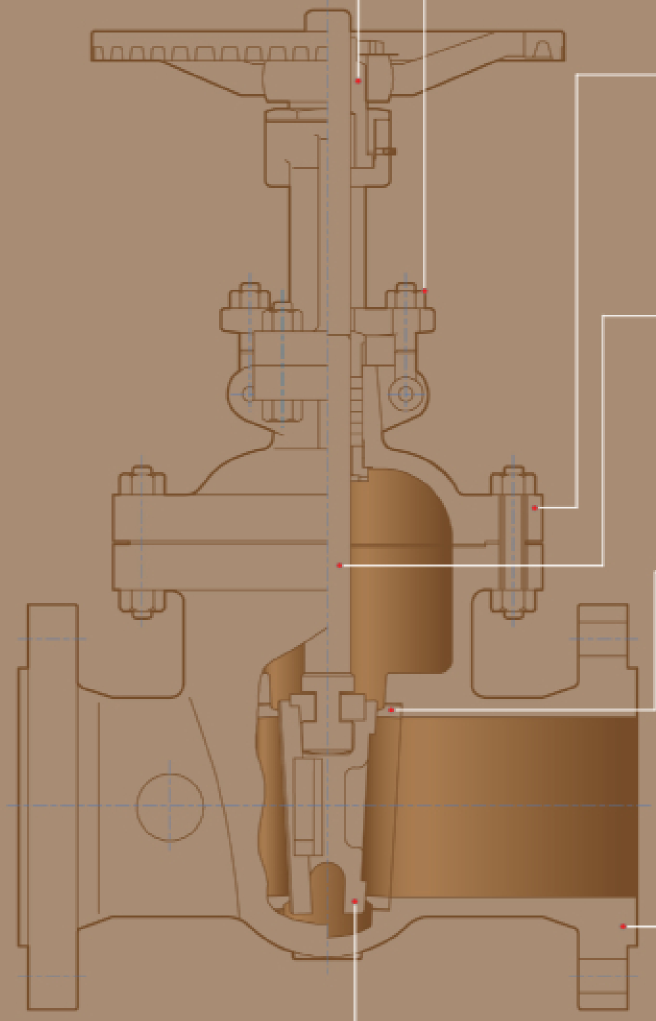


GATE VALVES

BOLTED BONNET

CAST CARBON STEEL

GATE VALVES BOLTED BONNET



STEM NUT

The upper portion of the Yoke Sleeve is hexagonally tapered to fix handwheel. The standard material of the Yoke Sleeve is Nodular Ni-resist D2 with over 1150℃(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 B 1.1 The stud-bolt nuts, hexagonal, rigid and hot-forged, bear material notation as well as do the bolt nuts made according to ANSI B 18.2.2

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 The stem dimensions are in accordance with API Std. 600 specifications.
The heat treated stem delivers adequate mechanical properties as well as excellent surface hardness. 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 deliven the best mechanical properties and required hardness. The difference is hardness between seats and wedge is in accordance with API specifications.

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. 60000. 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 operating conditions. Inlet and outlet port dimensions conform with ANSI B 16.5 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.

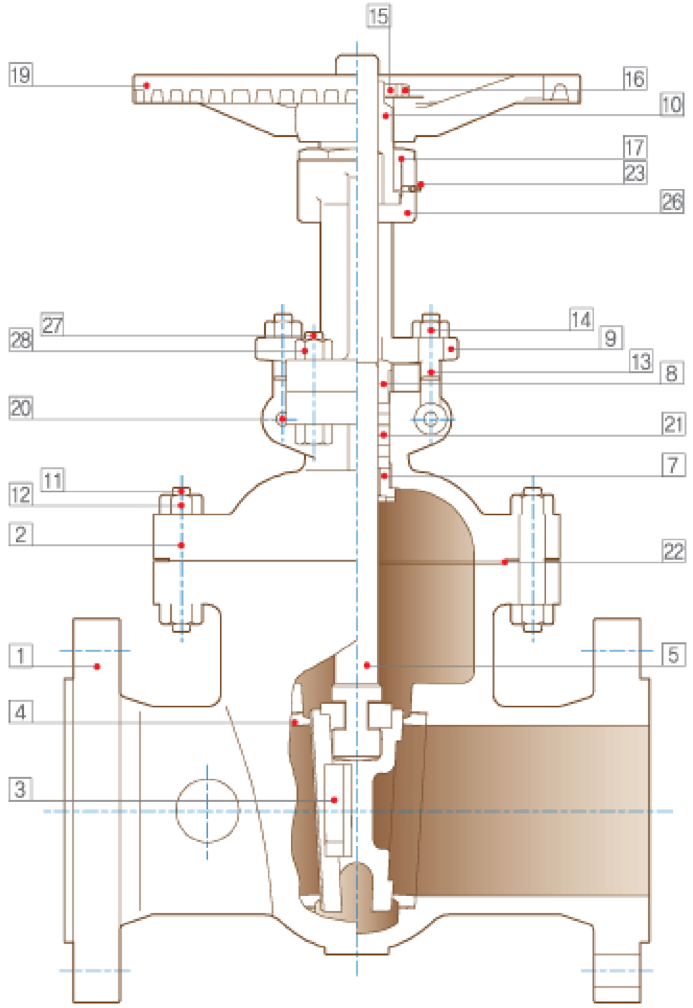
FLEXIBLE WEDGE

The standard disc of our valves is a one-piece flexible wedge. Slots are machined in 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.

NO	NAME OF PART	ASTM SPECIFICATION						KS SPEC
		STANDARD	HIGH TEMPERATURE SERVICE				LOW TEMPERATURE SERVICE	STANDARD
1	BODY	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	SCPH2
2	BONNET	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	SCPH2
3	⋆DISC	A217-CA15	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	SSC1
4	BODY SEAT RING	C/S1020+HF	A182-F1	A182-F11	A182-F22	A182-F5a	A182-F304	STEEL+HF
5	STEM	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	STS410
7	BONNET BUSH	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	STS410
8	PACKING GLAND	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	STS410
9	GLAND FLANGE	A105/A283-D	A105/A283-D	A105/A283-D	A105/A283-D	A105/A283-D	A105/A283-D	SF45
10	STEM NUT	A439-D2	A439-D2	A439-D2	A439-D2	A439-D2	A439-D2	FCD
11	BONNET BOLT	A193-B7	A193-B7	A193-B7	A193-B16	A193-B16	A320-L7	SNB7
12	BONNET NUT	A194-2H	A194-2H	A194-2H	A194-4	A194-4	A194-4	SM45C
13	GLAND BOLT	A307B	A307B	A307B	A307B	A307B	A307B	SM45C
14	GLAND NUT	A307B	A307B	A307B	A307B	A307B	A307B	SM45C
20	HINGE PIN	A108-1020	A108-1020	A108-1020	A108-1020	A108-1020	A108-1020	SM45C
26	YOKE	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB	SCPH2
27	YOKE BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	SNB7
28	YOKE NUT	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	SM45C

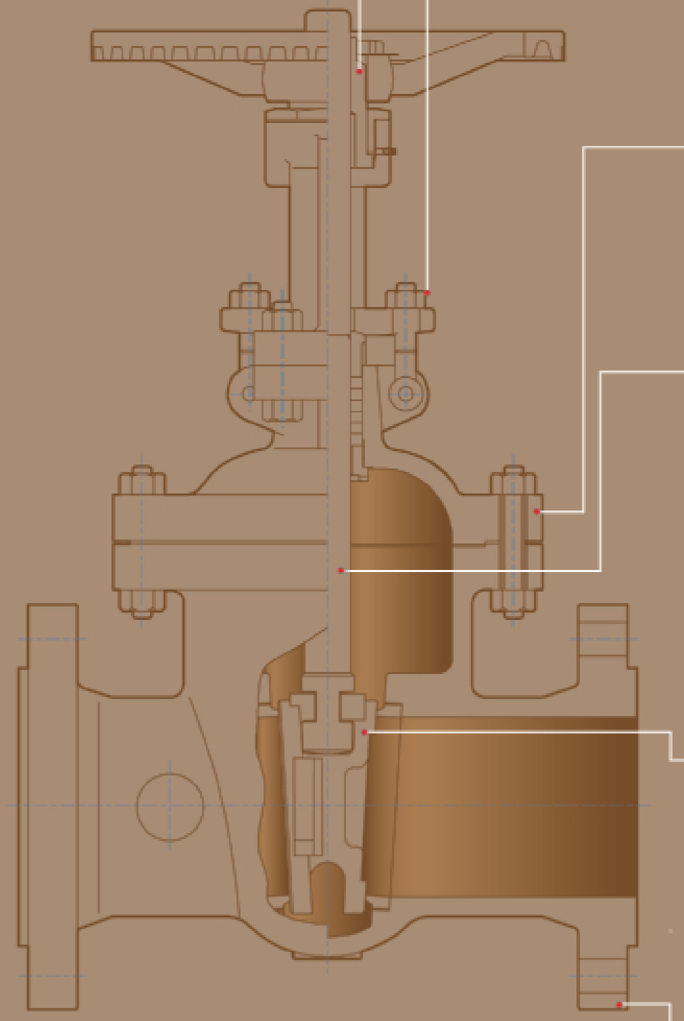
NO	NAME OF PART	ASTM SPECIFICATION
15	**HANDLE NUT**	A 307.B+ZN PLATED
16	**SET SCREW**	A 307.B
17	**SLEEVE GLAND**	STEEL
19	**HANDLEWHEEL**	A395
21	**PACKING**	SEE PAGE 63
22	**GASKET**	SEE PAGE 63
23	**GREASE NIPPLE**	B16

⋆ Note 1. In case of 12" and larger size, we'll use trim material overlayed one on the same or equivalent material of the Body.



CAST STAINLESS STEEL

GATE VALVES BOLTED BONNET



STEM NUT

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

BOLTING

Bonnet studs and nuts are manufactured from alloy or stainless steel to the relevant ASTM standard.

BONNET

The bonnet is in stainless steel. It is machined to accept the yoke sleeve and incorporates a stuffing box dimension in accordance with the API standard.

STEM

The stem is part of the trim. A stem is provided with a T-head. A ground backseat is provided to endure perfectly tight seal to the stuffing box when the valve is fully open.

The stem is ground to minimize friction and prevent damage to gland packing. The threading is trapezoidal ACME type. Dimensions comply with the applicable Standard.

WEDGE

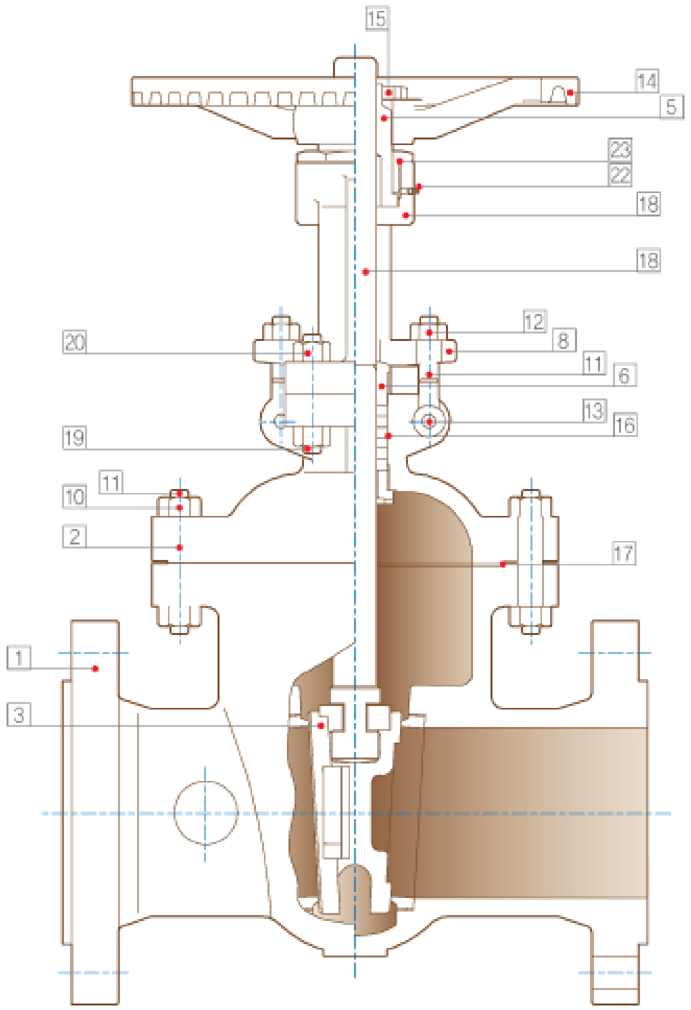
The wedge is part of the trim. It is normally supplied as flexible. It is connected to the stem by means of a T-joint. The guides on each side of the wedge are casted for proper alignment with the body guides. Special attention is given to the seating surface, which are ground and lapped to insure a perfectly tight seal.

BODY

The body is in cast stainless steel and is carefully designed in all its details. The basic dimension, i.e.wall thickness, face to face and flanges comply with the relevant API and ANSI standards. The sealing surfaces for connection to the bonnet are flat finish in the 150lb Class, recessed in the 300lb Class or may be ring joint in the 150lb Class in the 600lb Class and above. bosses may be provided for drain taps or by-pass piping

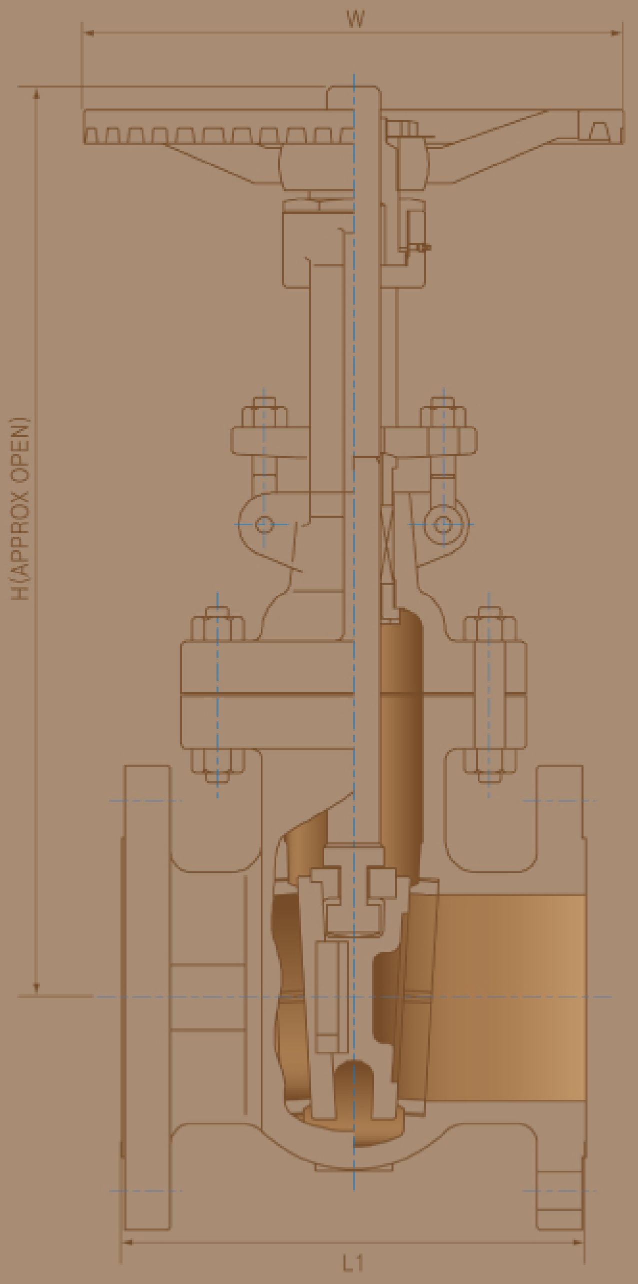
NO	NAME OF PART	ASTM SPECIFICATION				
		CORROSION SERVICE				REMARKS
1	BODY	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M	
2	BONNET	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M	
3	DISC	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M	
4	STEM	A276-304	A276-316	A276-304L	A276-316L	
5	STEM NUT	A439-D2	A439-D2	A439-D2	A439-D2	
6	PACKING GLAND	A276-304	A276-316	A276-316L	A276-316L	
8	GLAND FLANGE	A351-CF8/A240-304	A351-CF8/A240-304	A351-CF8/A240-304	A351-CF8/A240-304	
9	BONNET BOLT	A193-B8	A193-B8	A193-B8	A193-B8	
10	BONNET NUT	A194-8	A194-8	A194-8	A194-8	
11	GLAND BOLT	A193-B8	A193-B8	A193-B8	A193-B8	
12	GLAND NUT	A194-8	A194-8	A194-8	A194-8	
13	HINGE PIN	A276-304	A276-304	A276-304	A276-304	
14	HAND WHEEL	A395	A395	A395	A395	
15	HAND WHEEL NUT	A307-B+ZN PLATED	A307-B+ZN PLATED	A307-B+ZN PLATED	A307-B+ZN PLATED	
16	PACKING	COMMERCIAL	COMMERCIAL	COMMERCIAL	COMMERCIAL	NOTE 1
17	GASKET	COMMERCIAL	COMMERCIAL	COMMERCIAL	COMMERCIAL	NOTE 1
18	YOKE	A351-CF8	A351-CF8/CF8M	A351-CF8/CF3	A351-CF8/CF3M	
19	YOKE BOLT	A193-B8	A193-B8	A193-B8	A193-B8	
20	YOKE NUT	A194-8	A194-8	A194-8	A194-8	
21	SET SCREW	A307-B	A307-B	A307-B	A307-B	
22	GREASE NIPPLE	B16	B16	B16	B16	
23	SLEEVE GLAND	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M	

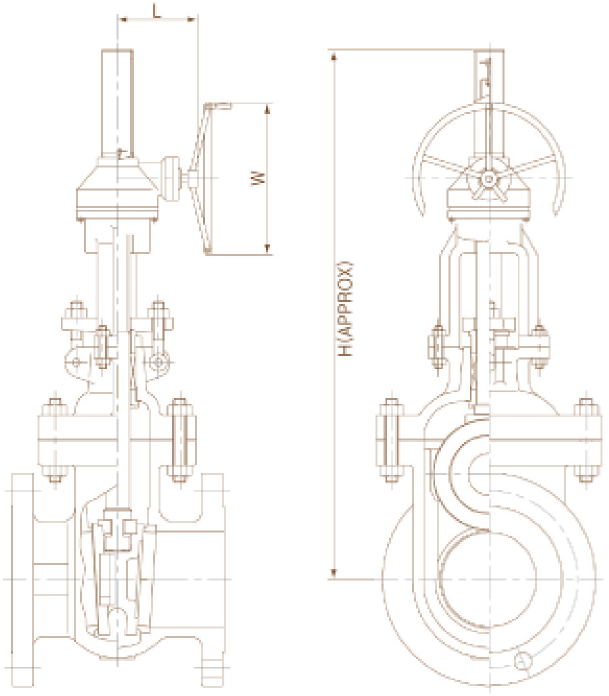
* Note 1. Packing & gasket material : customer's requirements, see page 87

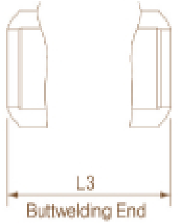


ASME CLASS 150LB

VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	28	30	36	40
	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750	900	1000
L1	inch	7.0	7.5	8.0	9.0	10.0	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	191	203	229	254	267	292	330	356	381	406	432	457	508	610	610	711	762
L3	inch		9.5	11.12	12.0	15.0	15.88	46.5	18.0	19.75	22.5	24.0	26.0	28.0	32.0	36.0	36.0	40.4	42.0
	mm	216	241	283	305	381	403	419	457	502	572	610	660	711	813	914	914	1016	1067
H	inch	14.0	16.3	18.4	22.2	26.5	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	674	762	1065	1285	1480	1523	1745	2010	2330	2784	3236	3417	4109	4670
W	inch	7.7	7.7	8.5	9.4	11.0	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	280	300	355	400	450	350	350	350	450	450	560	560	710	800
L	inch	-	-	-	-	-	-	-	-	-	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	132.3	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	60	70	106	167	239	345	490	578	731	1043	1620	1840	3400	4300



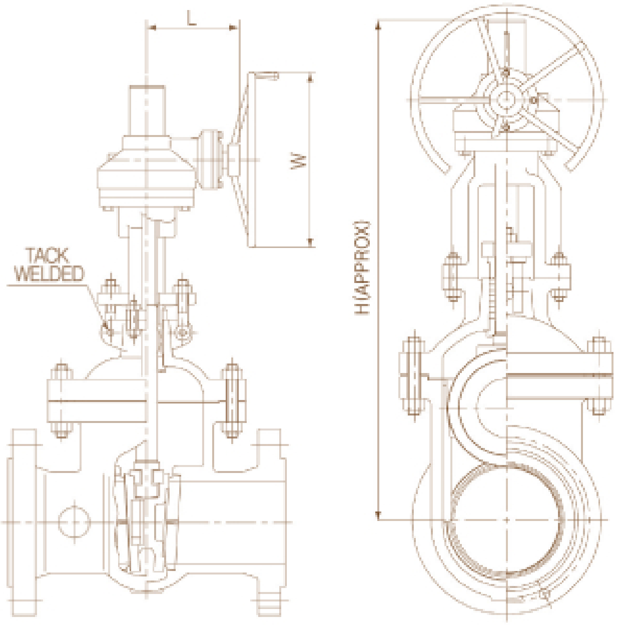


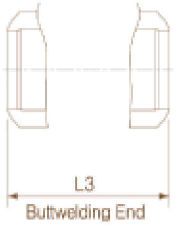


Buttwelding End

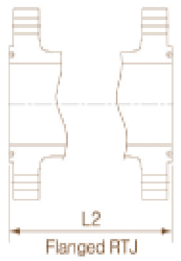
ASME CLASS 300LB

VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	28	30	36	40	42
	mm	50	65	80	100	12.5	150	200	250	300	350	400	450	500	600	700	750	900	1000	1050
L1 & L3	inch	8.5	9.5	11.12	12.0	15.0	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	381	403	419	457	502	762	838	914	991	1143	1346	1397	1727	1930	1981
L2	inch	9.12	10.12	11.74	12.62	15.63	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	216	257	298	321	397	419	435	473	518	778	854	930	1010	1165	1372	1422	1756	-	-
H	inch	16.3	17.5	20.5	23.2	28.3	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	720	845	1025	1225	1560	1523	1745	2010	2330	2784	3302	3772	4312	4791	5032
W	inch	7.7	7.7	8.5	9.4	11.0	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	280	355	400	450	500	450	450	560	560	710	900	900	760	760	760
L	inch	-	-	-	-	-	-	-	-	-	14.3	14.3	16.3	16.3	18.4	21.8	21.8	21.8	20.2	20.2
	mm	-	-	-	-	-	-	-	-	-	362	36	414	414	468	554	554	554	512	512
WEIGHT	LB	52.9	75.0	90.4	143.3	209.5	257.9	401.3	268.2	1060.6	1528.1	2094.8	2535.8	3307.5	4961.3	6637.1	8595.6	10579.2	15428.0	18734.0
	Kg	24	34	41	65	95	117	182	355	481	693	950	1150	1500	2250	3010	3900	4800	7000	8500

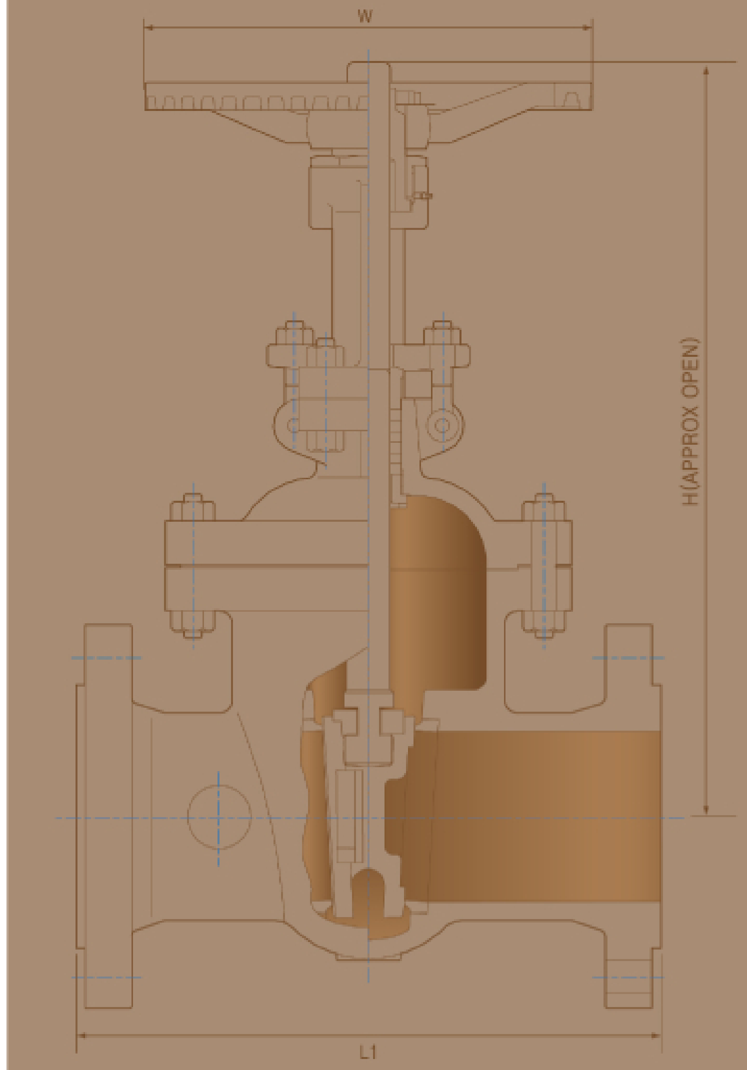




Buttwelding End

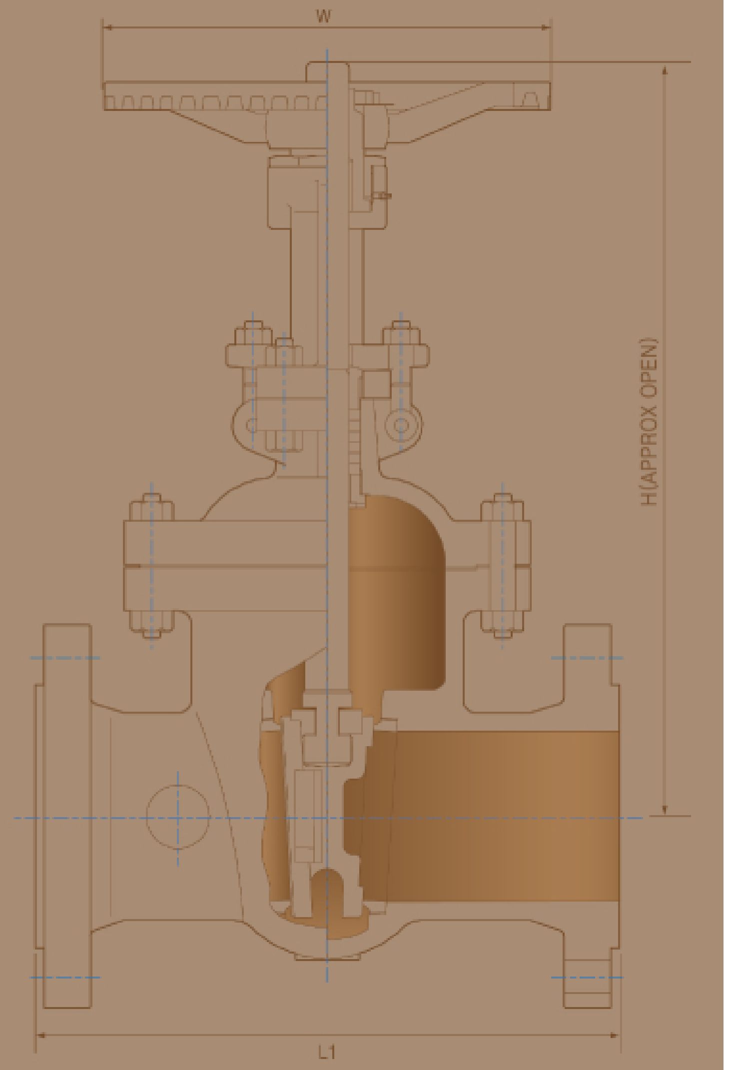


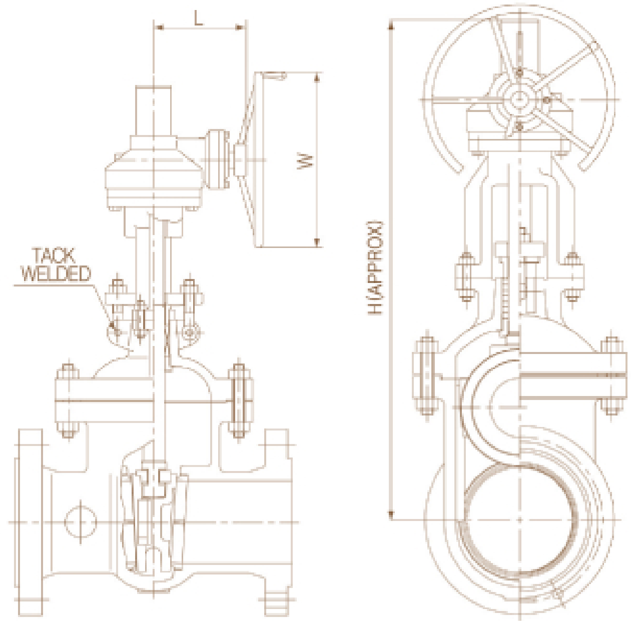
Flanged RTJ

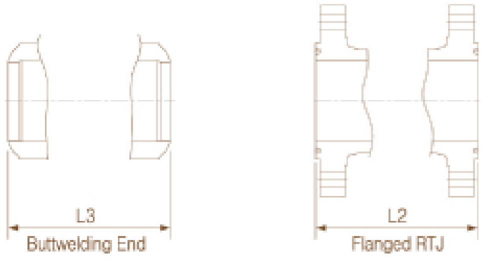


ASME CLASS 600LB

VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14	16	18	20	24
	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600
L1 & L3	inch	11.5	13.0	14.0	17.0	20.0	22.0	26.0	31.0	33.0	35.0	39.0	43.0	47.0	55.00
	mm	292	330	356	432	508	559	660	787	838	889	991	1092	1194	1397
L2	inch	11.62	13.12	14.12	17.12	19.57	22.12	26.12	31.12	33.12	35.12	39.12	43.12	47.25	55.38
	mm	295	333	359	435	511	562	664	791	841	892	994	1095	1200	1406
H	inch	18.7	21.6	23.5	26.8	31.5	36.6	45.7	53.1	61.8	72.1	82.9	98.0	104.8	116.9
	mm	475	550	598	680	800	930	1160	1350	1570	1832	2106	2489	2662	2970
W	inch	7.7	7.7	9.4	11.8	14.0	17.7	17.7	19.7	22.0	22.0	27.9	27.9	31.5	35.4
	mm	195	195	240	300	355	450	450	500	560	560	710	710	800	900
L	inch	-	-	-	-	-	-	-	-	16.3	16.3	18.4	18.4	20.7	26.4
	mm	-	-	-	-	-	-	-	-	414	414	468	468	526	670
WEIGHT	LB	79.4	127.9	154.4	269.0	441	551.2	893.0	1433.2	1896.3	2734.2	3109.1	4890.7	6198.3	8656.8
	Kg	36	58	70	122	200	250	405	650	860	1240	1410	2218	2811	3926

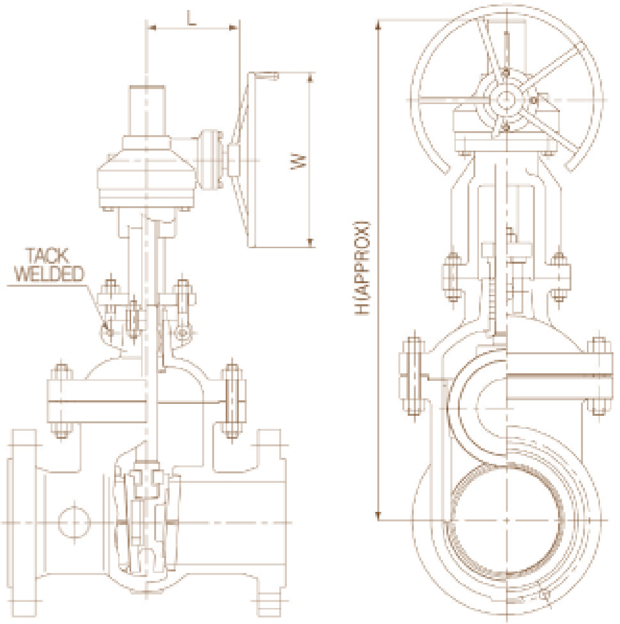


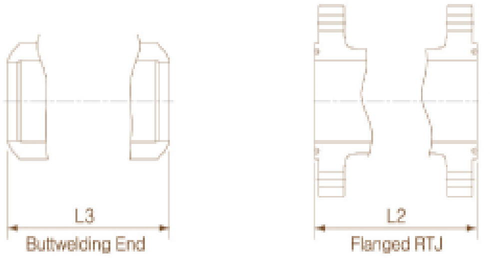


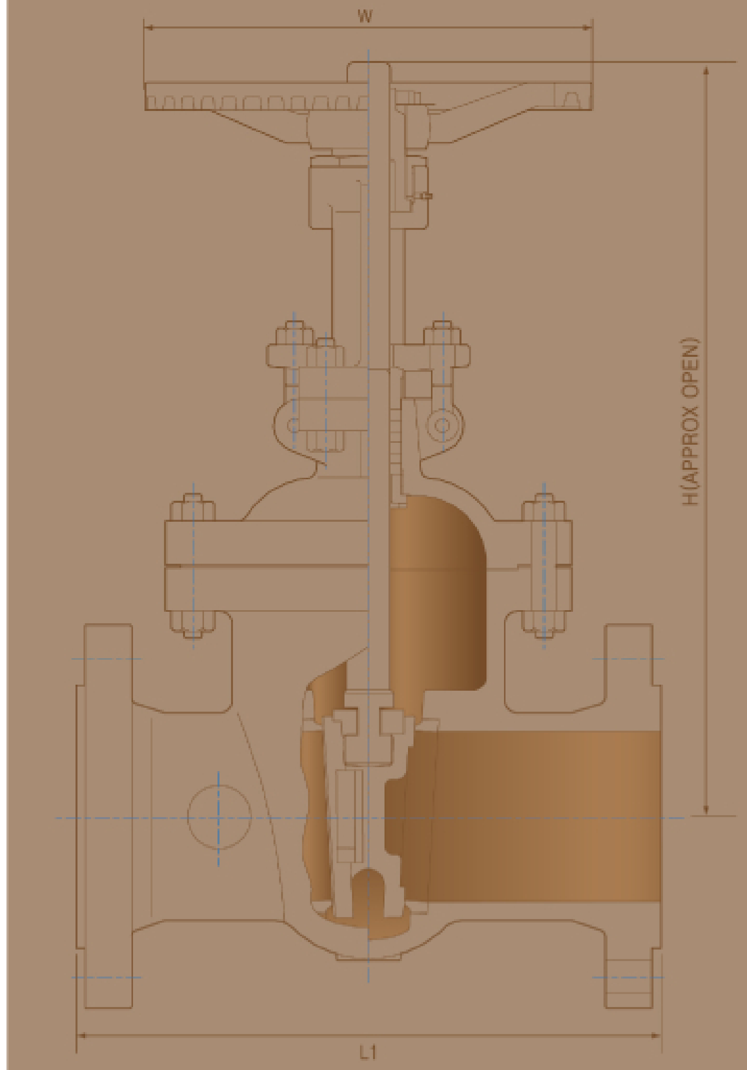


ASME CLASS 900LB

VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14	16	18	20	24
	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600
L1 & L3	inch	14.5	16.5	15.0	18.0	22.0	24.0	29.0	33.0	38.0	40.5	44.5	48.0	52.0	61.0
	mm	368	419	381	457	559	610	737	838	965	1029	1130	1219	1321	1549
L2	inch	14.62	16.62	15.12	18.12	22.13	24.12	29.12	33.12	38.12	40.88	44.88	48.5	52.5	61.75
	mm	371	422	384	460	562	613	740	841	968	1038	1140	1232	1334	1568
H	inch	21.2	26.4	26.4	30.8	37.1	42.4	55.5	67.7	77.4	74.9	80.7	88.8	110.2	124.0
	mm	539	670	672	782	943	1076	1411	1720	1965	1902	2051	2256	2800	3150
W	inch	11.8	11.8	14.0	15.7	19.7	22.0	17.7	22.0	22.0	24.0	24.0	30.0	30.0	24.0
	mm	300	300	355	400	500	560	450	560	560	610	610	760	760	610
L	inch	-	-	-	-	-	-	14.3	16.3	16.3	20.0	20.2	21.8	21.8	20.2
	mm	-	-	-	-	-	-	362	414	414	512	512	554	554	512
WEIGHT	LB	181	341.8	364	384	661.5	999	1720	2752	3400	4895.1	6615	8533.4	10716.3	16096.5
	Kg	82	155	165	174	300	453	780	1248	1542	2220	3000	3870	4860	7300

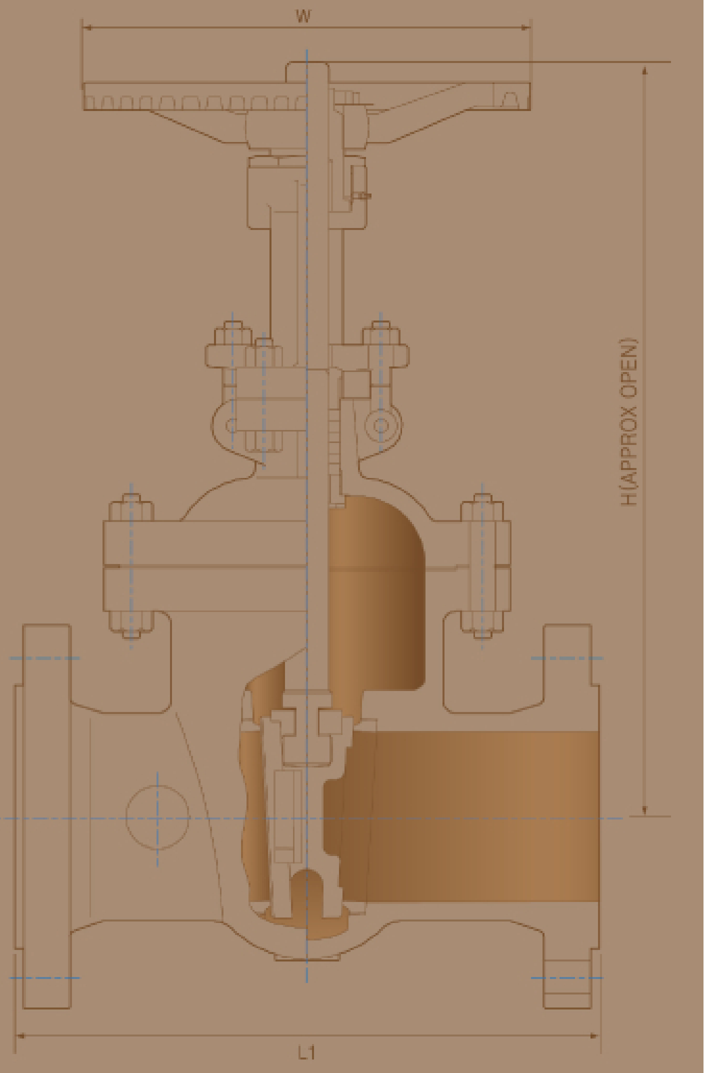


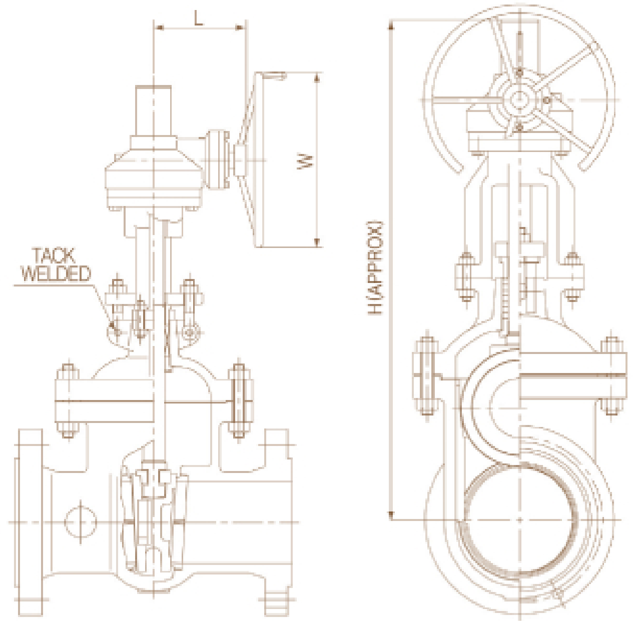


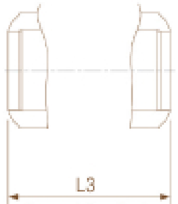


ASME CLASS 1500LB

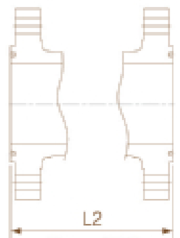
VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14	16
	mm	50	62	80	100	125	150	200	250	300	350	400
L1 & L3	inch	14.5	16.5	18.5	21.5	26.5	27.75	32.75	39.0	44.5	49.5	54.5
	mm	368	419	470	546	673	705	832	991	1130	1257	1384
L2	inch	14.62	16.62	18.62	21.62	26.61	28.0	33.13	39.38	45.12	50.25	55.38
	mm	371	422	473	549	676	711	842	1000	1146	1276	1407
H	inch	21.2	26.4	29.1	30.8	43.62	47.0	60.8	66.5	82.3	85.1	97.9
	mm	539	670	738	783	1108	1196	1546	1688	1090	2167	2486
W	inch	11.8	11.8	15.7	19.7	24.8	13.8	22.0	27.9	27.9	30.0	30.0
	mm	300	300	400	500	630	350	560	710	710	760	760
L	inch	-	-	-	-	-	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	926.1	1360	3175	4412	8417	9073.6	15324.8
	Kg	82	155	182	260	420	617	1440	2001	3816	4115	6950



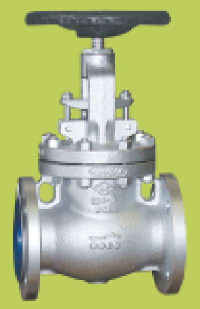


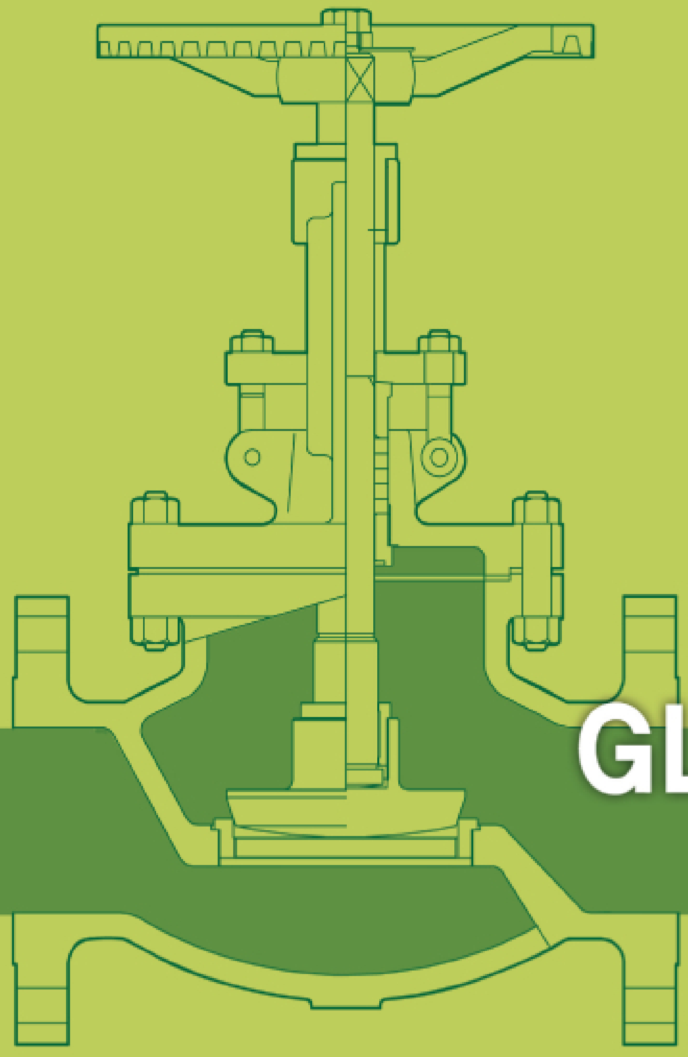


Buttwelding End



Flanged RTJ



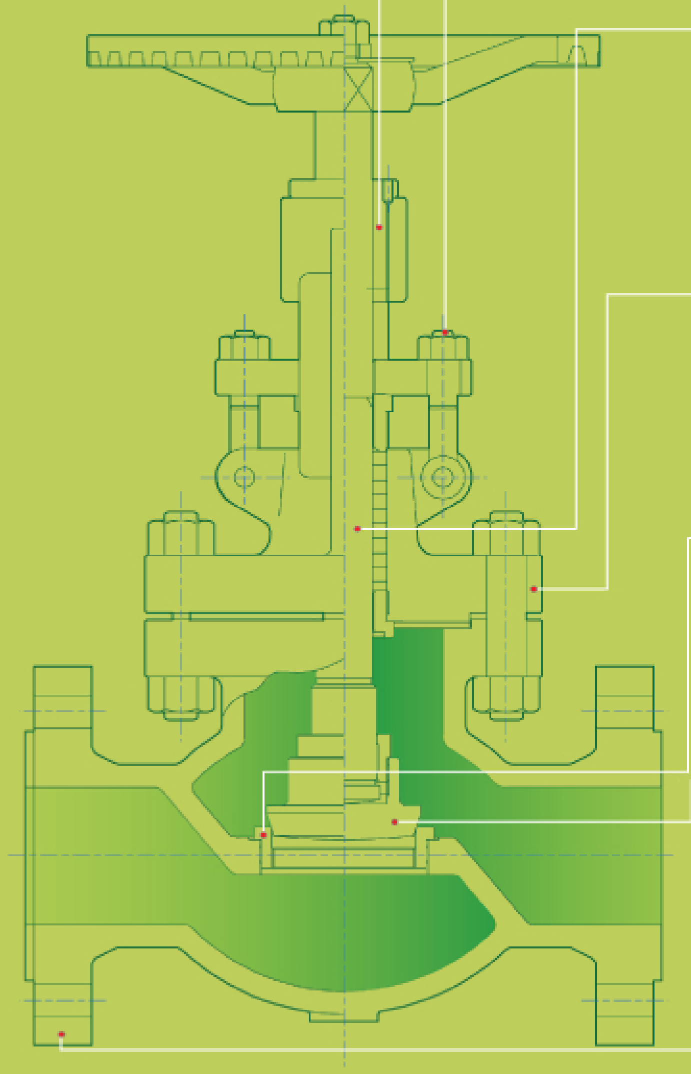


GLOBE VALVES

BOLTED BONNET

CAST CARBON STEEL

GLOBE VALVES BOLTED BONNET



YOKE BUSH

The standard material of the Yoke sleeve is Nodular Ni-resist D2 with over a 1150℃(2100℉) dissolution point in conformity with API Std. Specifications.

BOLTING

The body-bonnet bolts are manufactured in accordance with API Std. 600 specifications. The nuts also strictly confrom with ANS 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

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.

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.

SEAT RING

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

DISC

The disc of our globe valve 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.

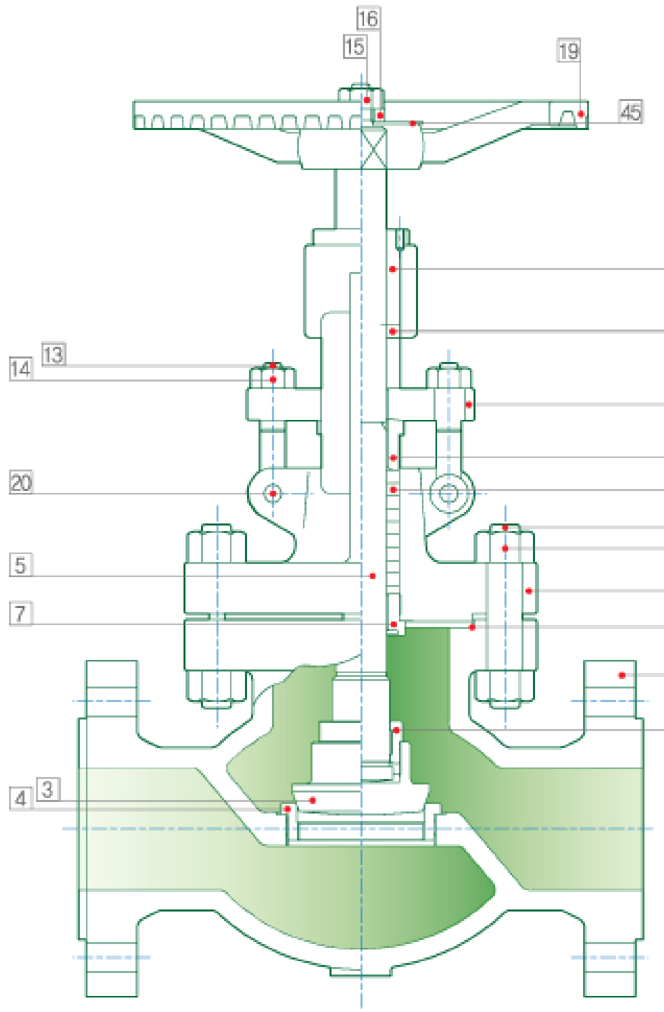
BODY

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 ANI B 16.5 Pipe fitting.
The screw-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, accurate machining insures perfact coaxially of the valve ends an seat ring in addition to exact perpendicularity of a body-bonnet flanges.

NO	NAME OF PART	ASTM SPECIFICATION						KS SPEC
		STANDARD	HIGH TEMPERATURE SERVICE				LOW TEMPERATURE SERVICE	STANDARD
1	BODY	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	SCPH2
2	BONNET	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	SCPH2
3	·DISC	A217-CA15	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	SSC1
4	BODY SEAT RING	C/S1020+HF	A182-F1	A182-F11	A182-F22	A182-F5a	A182-F304	STEEL+HF
5	STEM	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	STS410
6	DISC GLAND	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	STS410
7	BONNET BUSH	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	STS410
8	PACKING GLAND	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	STS410
9	GLAND FLANGE	A105/A283-D	A105/A283-D	A105/A283-D	A105/A283-D	A105/A283-D	A105/A283-D	SF45
10	YOKE BUSH	A439-D2	A439-D2	A439-D2	A439-D2	A439-D2	A439-D2	FCD45
11	BONNET BOLT	A193-B7	A193-B7	A193-B16	A193-B16	A193-B16	A193-L7	SNB7
12	BONNET NUT	A194-2H	A194-2H	A194-4	A194-4	A194-4	A194-4	SM45C
13	GLAND BOLT	A307.B	A307.B	A307.B	A307.B	A307.B	A307.B	SM45C
14	GLAND NUT	A307.B	A307.B	A307.B	A307.B	A307.B	A307.B	SM45C
20	HINGE PIN	A108-1020	A108-1020	A108-1020	A108-1020	A108-1020	A108-1020	STS410

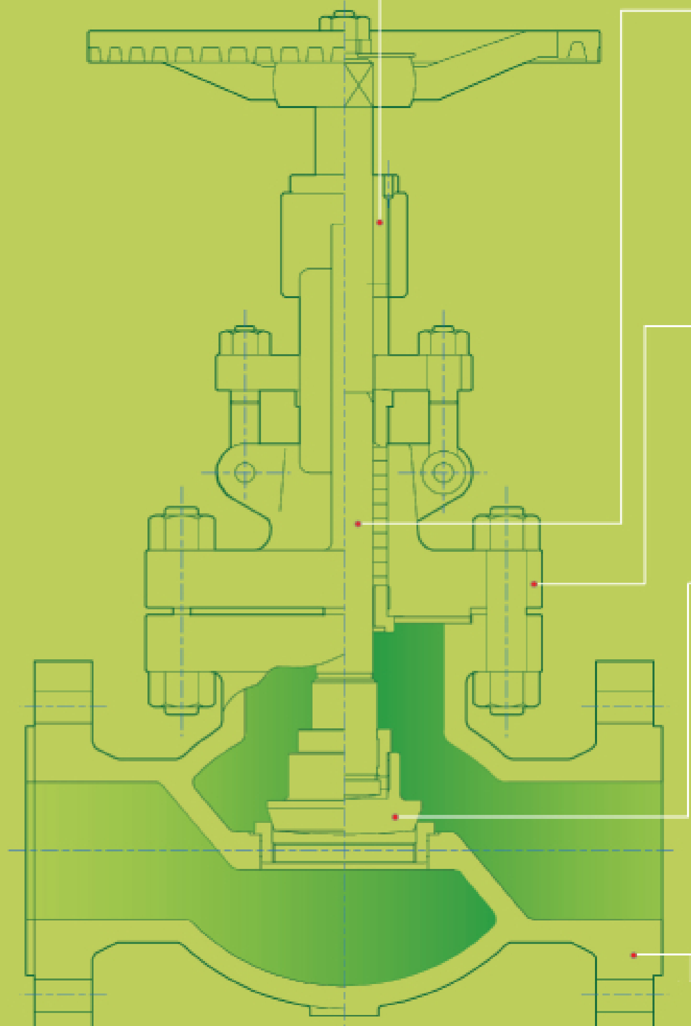
* Note 1. In case of 12" and larger size, we'll use trim material overlayed one on the same or equivalent material of the Body.

NO	NAME OF PART	ASTM SPECIFICATION
15	**HANDLE NUT**	A283C
16	**SET SCREW**	A307.B
19	**HANDWHEEL**	A395
21	**PACKING**	SEE PAGE 63
22	**GASKET**	SEE PAGE 63
30	**STOPPER for Gear**	A283-D
45	**WASHER**	STEEL



CAST STAINLESS STEEL

GLOBE VALVES BOLTED BONNET



YOKE BUSH

The yoke sleeve is made from bronze, stainless steel or ductile iron having high resistance to wear and a high melting point. It is screwed into the bonnet and properly sized to withstand the stresses, which develop when opening and closing the valve.

STEM

The stem is part of the trim. A ground backseat is provided to ensure perfectly tight seal to the stuffing box when the valve is fully open. The stem is attached to the disc by means of a threaded ring, which allows the disc to rotate. The stem is ground to minimize friction and prevent damage to gland packing.

BONNET

The bonnet is in stainless steel. It is machined to accept the yoke sleeve and incorporates a stuffing box dimension in accordance with the BS standard

DISC

The disc is part of the trim. It is normally supplied of the flat, tapered or plug type or, on request, of the parabolic regulating type, always free to rotate on the stem.

Special attention is given to the seat ring face, which is ground and lapped for a perfectly tight seal.

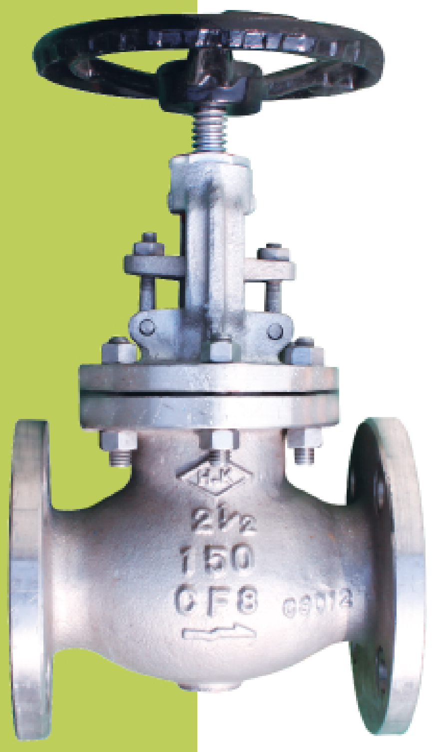
BODY

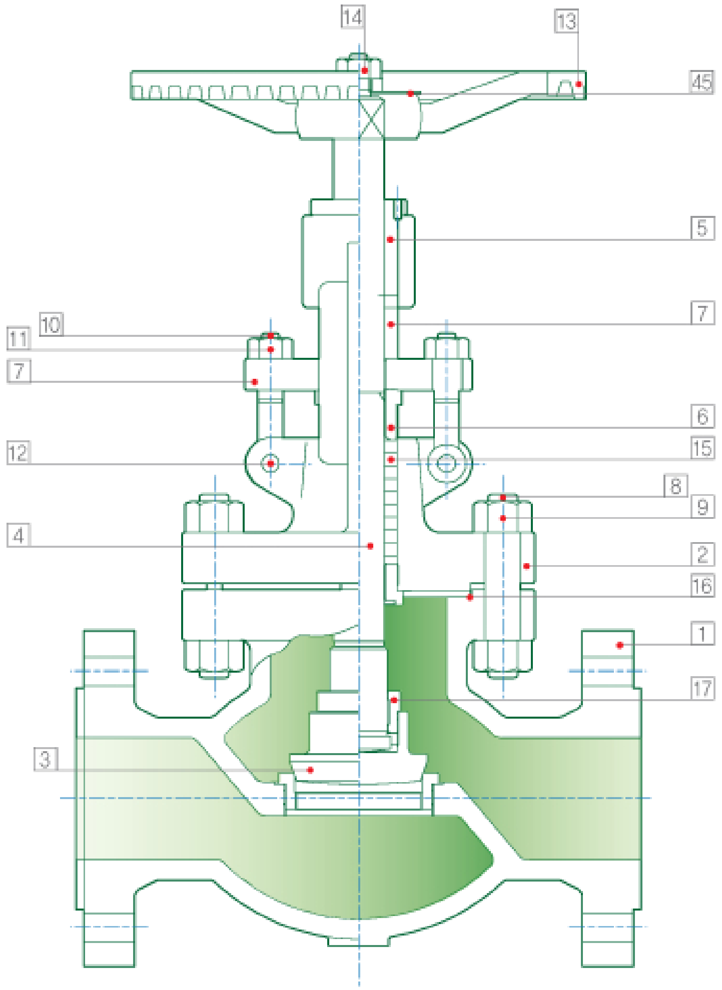
The body is in stainless steel. The basic dimension, i.e.wall thickness, face to face and flanges comply with the relevant API and ANSI standards. The Body-to-bonnet flange is circular and the sealing surface for connections to the bonnet are recessed in the 150lb and 300lb class or may be ring joint in the higher classes.

The body may be threaded for renewable seats. Bosses may be provided for drain taps or by-pass piping.

NO	NAME OF PART	ASTM SPECIFICATION				REMARKS
		CORROSION SERVICE				
1	BODY	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M	
2	BONNET	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M	
3	DISC	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M	NOTE1
4	STEM	A276-304	A276-316	A276-304L	A276-316L	
5	YOKE BUSH	A439-D2	A439-D2	A439-D2	A439-D2	
6	PACKING GLAND	A276-304	A276-316	A276-304L	A276-316L	
7	GLAND FLANGE	A351-CF8/A240-304	A351-CF8/A240-304	A351-CF8/A240-304	A351-CF8/A240-304	
8	BONNET BOLT	A193-B8	A193-B8	A193-B8	A193-B8	
9	BONNET NUT	A194-8	A194-8	A194-8	A194-8	
10	GLAND BOLT	A193-B8	A193-B8	A193-B8	A193-B8	
11	GLAND NUT	A194-8	A194-8	A194-8	A194-8	
12	HINGE PIN	A276-304	A276-304	A276-304	A276-304	
13	HAND WHEEL	A395	A395	A395	A395	
14	HAND WHEEL NUT	A283-C	A283-C	A283-C	A283-C	
15	PACKING	COMMERCIAL	COMMERCIAL	COMMERCIAL	COMMERCIAL	NOTE2
16	GASKET	COMMERCIAL	COMMERCIAL	COMMERCIAL	COMMERCIAL	NOTE2
17	DISC GLAND	A276-304	A276-316	A276-304L	A276-316L	
45	WASHER	A283-C	A283-C	A283-C	A283-C	

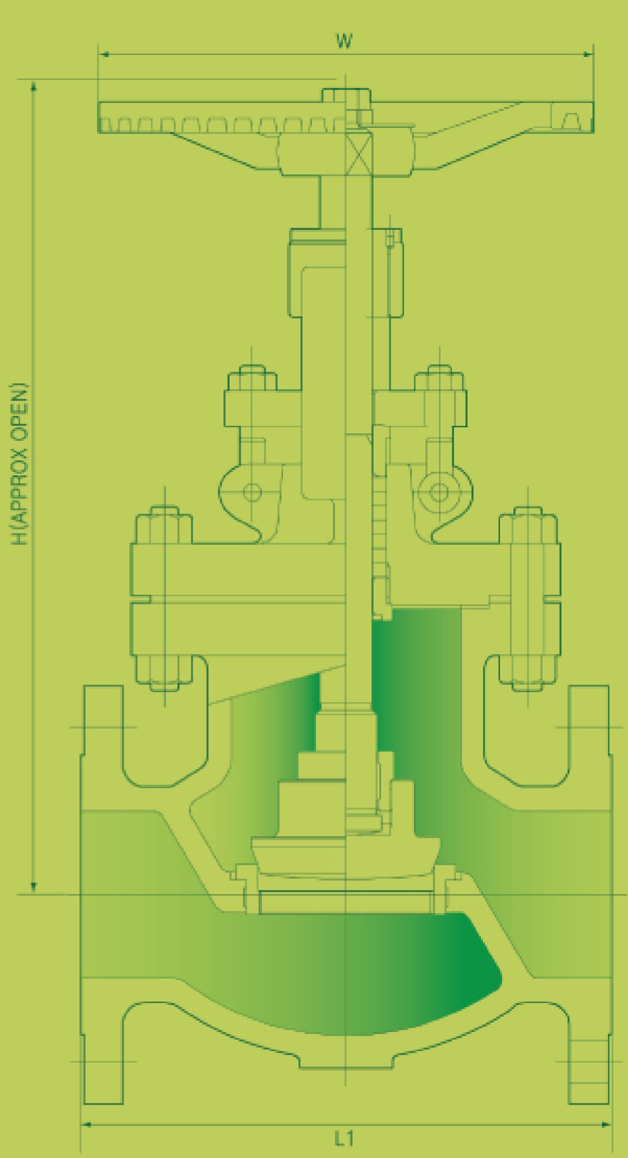
Note 1. In case of 8" and larger : bottom guide type
2. Packing & gasket material : customer's requirements, see page 87

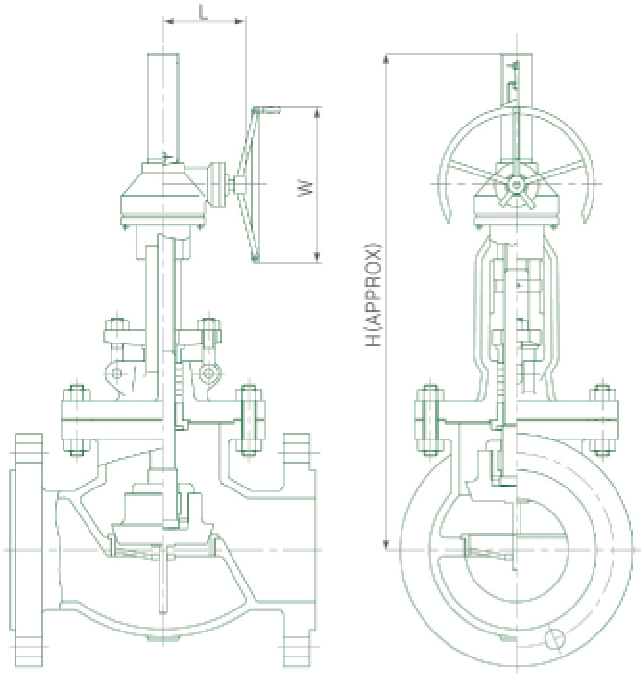


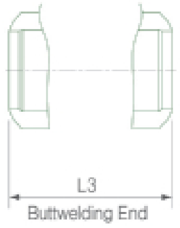


ASME CLASS 150LB

VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14	16	18	20	24
	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600
L1 & L3	inch	8.0	8.5	9.5	11.5	14.0	16.0	19.5	24.5	27.5	31.0	36.0	38.5	38.5	51.0
	mm	203	216	241	292	356	406	495	622	699	787	914	978	978	1295
H	inch	10.8	11.4	12.5	13.8	15.6	17.3	22.0	26.4	29.1	54.7	62.6	71.7	80.7	90.6
	mm	275	290	320	350	400	440	560	670	740	1390	1590	1820	2050	2300
W	inch	7.7	7.7	8.5	9.4	11.0	11.8	14.0	15.7	17.7	22.0	22.0	24.0	27.6	27.6
	mm	195	195	215	240	280	300	355	400	450	560	560	610	700	700
L	inch	-	-	-	-	-	-	-	-	-	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	163.2	209.5	410.1	804.8	804.8	1364.9	1808.1	2154.3	2712.2	3472.9
	Kg	21	27	33	53	74	95	186	365	365	619	820	977	1230	1575



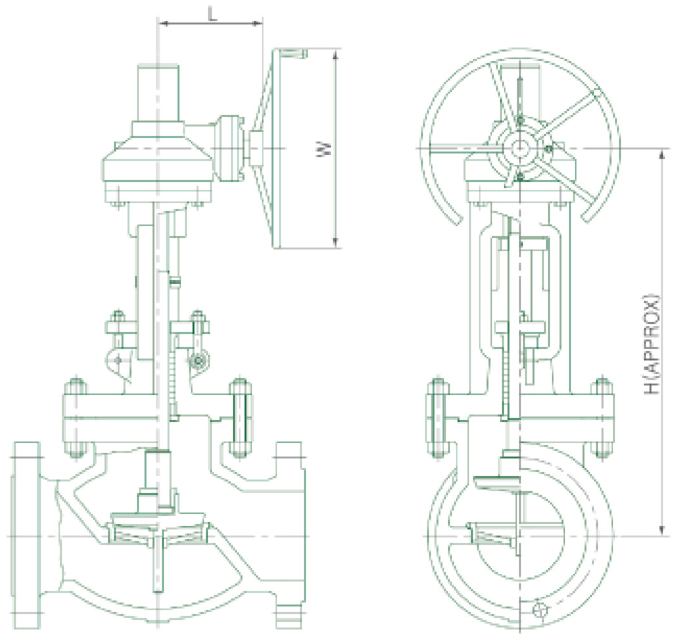


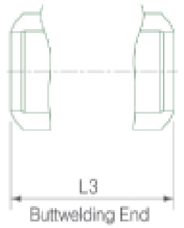


Buttwelding End

ASME CLASS 300LB

VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	32
	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600	800
L1 & L3	inch	10.5	11.5	12.5	14.0	15.75	17.5	22.0	24.5	28.0	33.0	34	38.5	40	53	62.75
	mm	267	292	318	356	400	445	559	622	711	838	864	978	1016	1346	1594
L2	inch	11.12	12.12	13.12	14.62	16.38	18.12	22.62	25.12	28.62	33.6	34.6	39.12	40.75	53.88	63.4
	mm	283	308	333	371	416	460	575	638	727	854	879	994	1035	1369	1610
H	inch	14.4	15.7	16.1	18.9	26.6	27.6	29.5	31.5	37.6	54.7	62.6	71.7	80.7	90.6	122.0
	mm	365	400	410	480	676	700	750	800	955	1390	1590	1820	2050	2300	3100
W	inch	7.7	8.5	9.4	10.6	12.4	14.00	15.7	17.7	19.7	22.1	27.6	27.6	27.6	31.5	31.5
	mm	195	215	240	270	315	355	400	450	500	560	700	700	700	800	800
L	inch	-	-	-	-	-	-	-	-	-	16.3	18.4	18.14	18.4	20.7	20.7
	mm	-	-	-	-	-	-	-	-	-	414	468	468	468	526	526
WEIGHT	LB	61.7	86.0	99.2	189.6	253.6	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	115	150	282	367	474	865	1147	1367	1620	2340	3340





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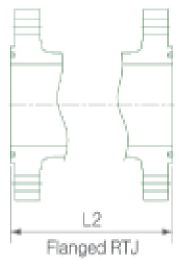
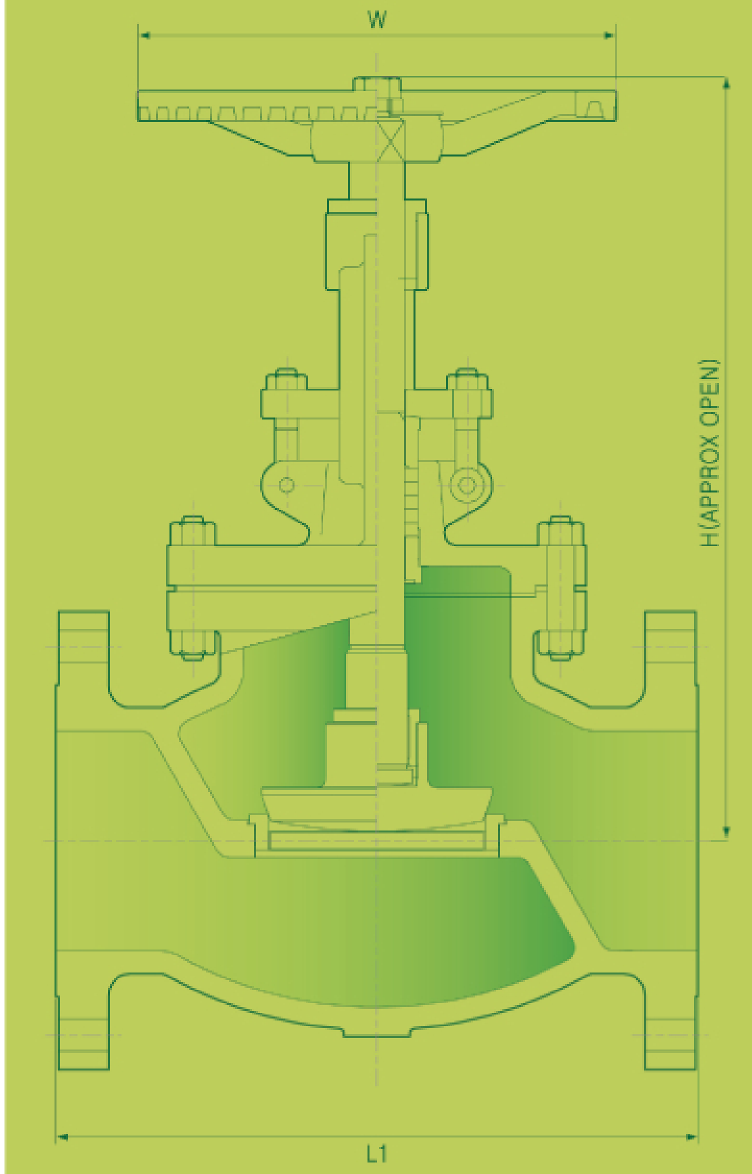
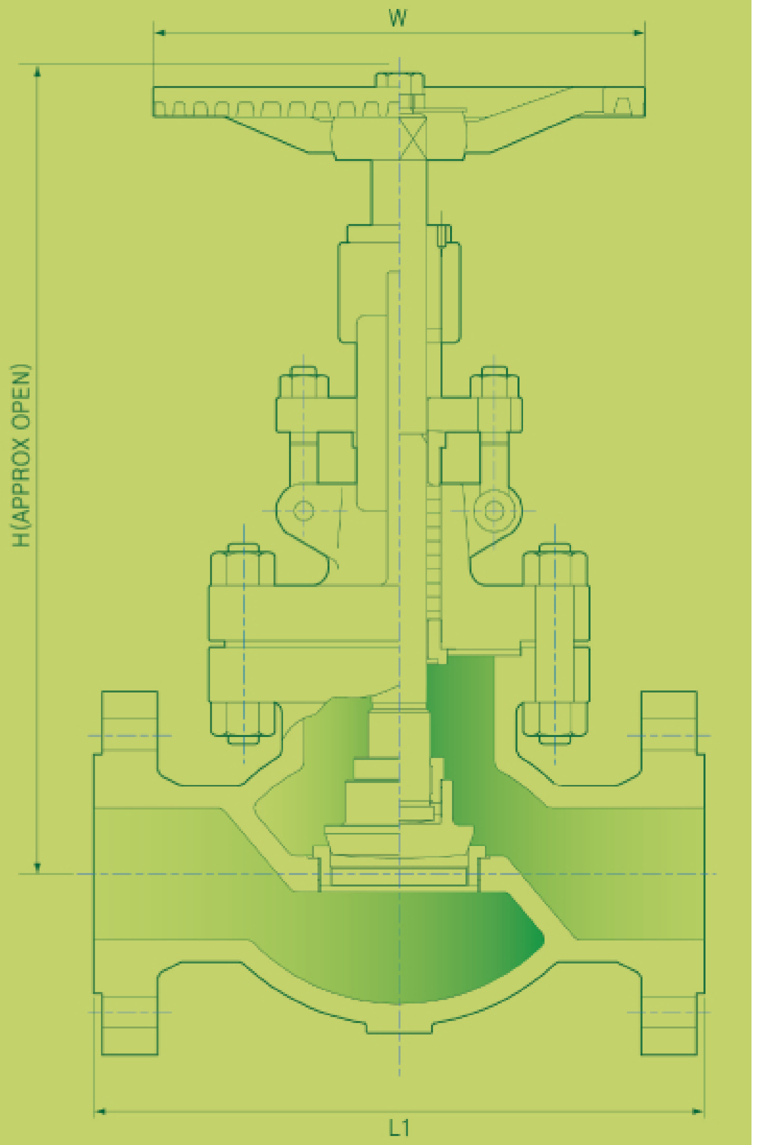


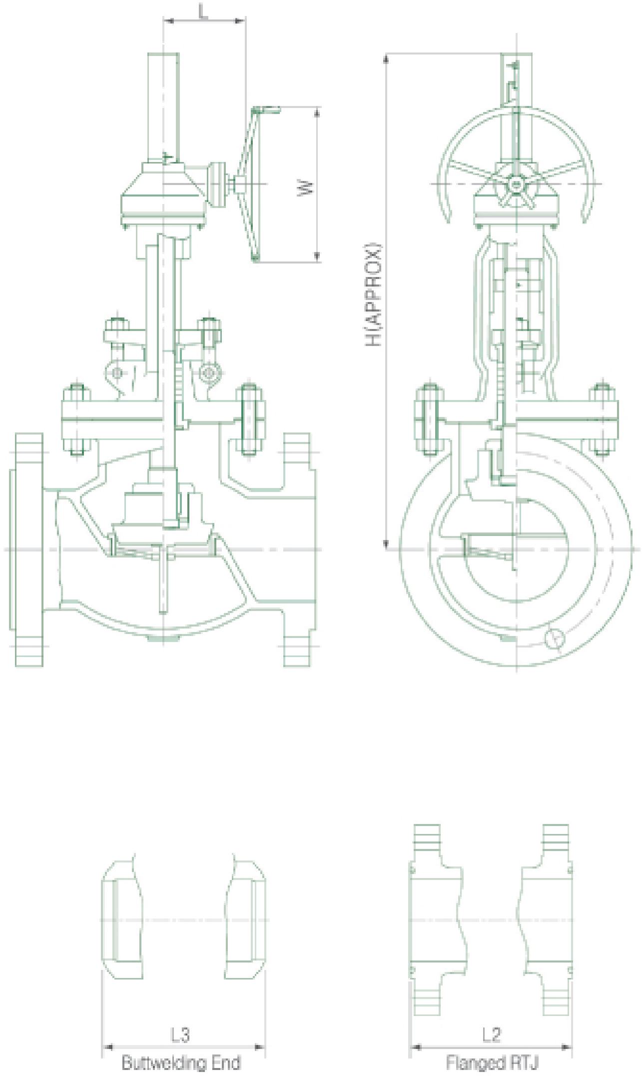
Flanged RTJ



ASME CLASS 600LB

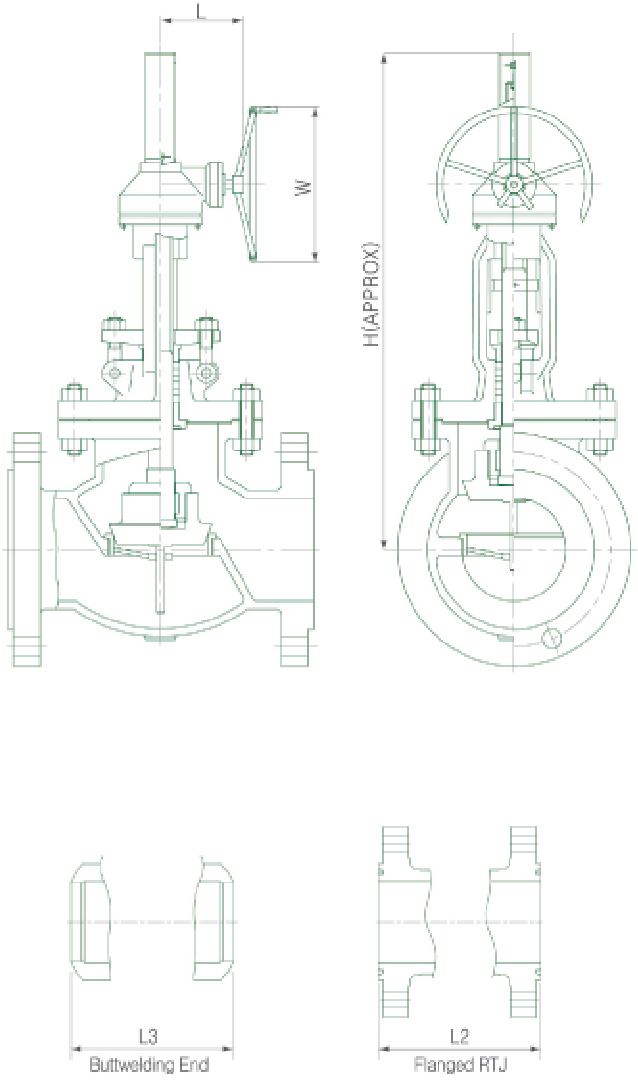
VALVE SIZE												
VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14	16
	mm	50	65	80	100	125	150	200	250	300	350	400
L1 & L3	inch	11.5	13.0	14.0	17.0	20.0	22.0	26.0	31.0	33.0	35.0	39.0
	mm	292	330	356	432	508	559	660	787	838	889	991
L2	inch	11.62	13.12	14.12	17.12	20.12	22.12	26.12	31.12	33.12	35.12	39.12
	mm	295	333	359	435	511	562	664	791	841	892	994
H	inch	16.0	19.8	19.9	22.4	31.8	37.8	51.8	59.5	96.9	70.9	76.0
	mm	407	502	505	568	807	959	1315	1511	1775	1800	1930
W	inch	7.7	8.5	10.6	11.8	14.0	15.7	28.0	31.5	35.4	35.4	35.4
	mm	195	215	270	300	355	400	710	800	900	900	·900
L	inch	-	-	-	-	-	-	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	511.3	714.4	1234.8	1741.9	2264.5	2932.7	3825.7
	Kg	52	65	85	150	250	324	560	790	1027	1330	1735

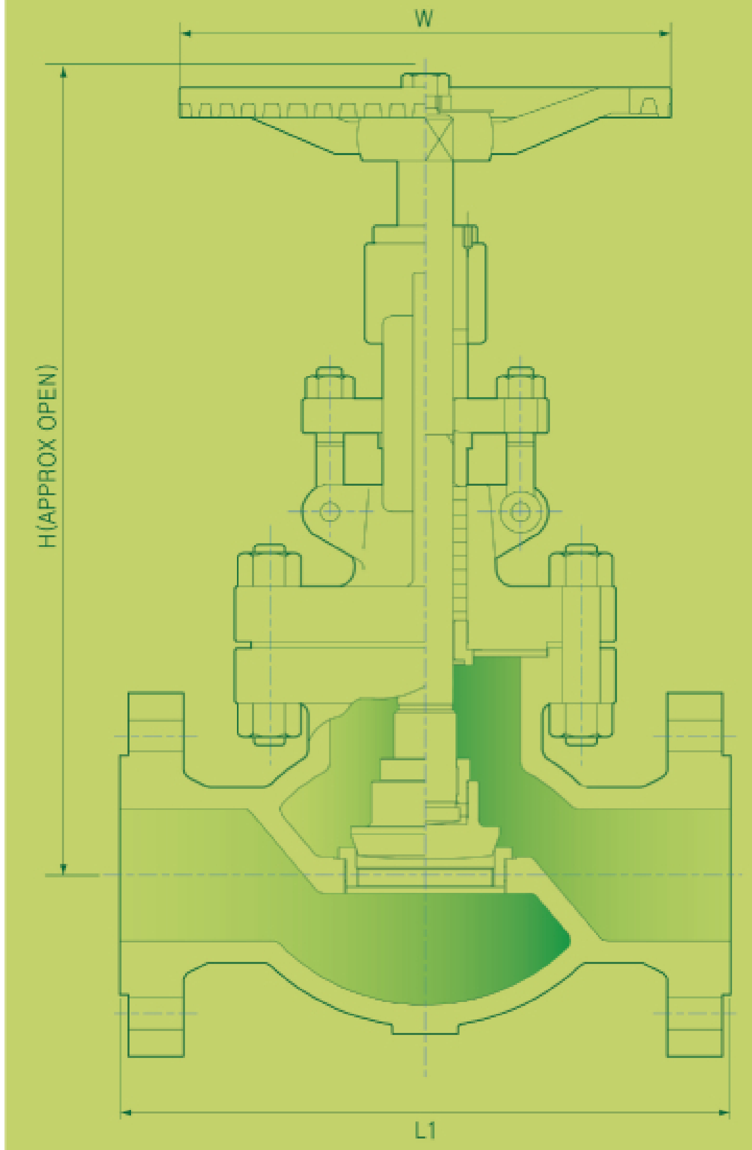




ASME CLASS 900LB

VALVE SIZE											
VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14
	mm	50	65	80	100	125	150	200	250	300	350
L1 & L3	inch	14.5	16.5	15.0	18.0	22.0	24.0	29.0	33.0	38.0	40.5
	mm	368	419	381	457	559	610	737	838	965	1029
L2	inch	14.62	16.62	15.12	18.12	22.13	24.12	29.12	33.12	38.12	40.88
	mm	371	422	384	460	562	613	740	841	968	1038
H	inch	27.4	27.4	30.5	33.7	53.1	58.6	65.69	63.0	67.1	87.0
	mm	695	695	775	855	1350	1488	1665	1600	1705	2210
W	inch	15.7	15.7	15.7	15.7	19.7	22.0	31.5	31.5	35.4	35.4
	mm	400	400	400	400	500	560	800	800	900	900
L	inch	-	-	-	-	-	16.3	20.7	20.7	26.4	26.4
	mm	-	-	-	-	-	414	526	526	670	670
WEIGHT	LB	176.4	271.2	154	441	815.9	1101.5	2756.3	4520.3	5843.3	8048.3
	Kg	80	123	161	200	370	500	1250	2050	2650	3650

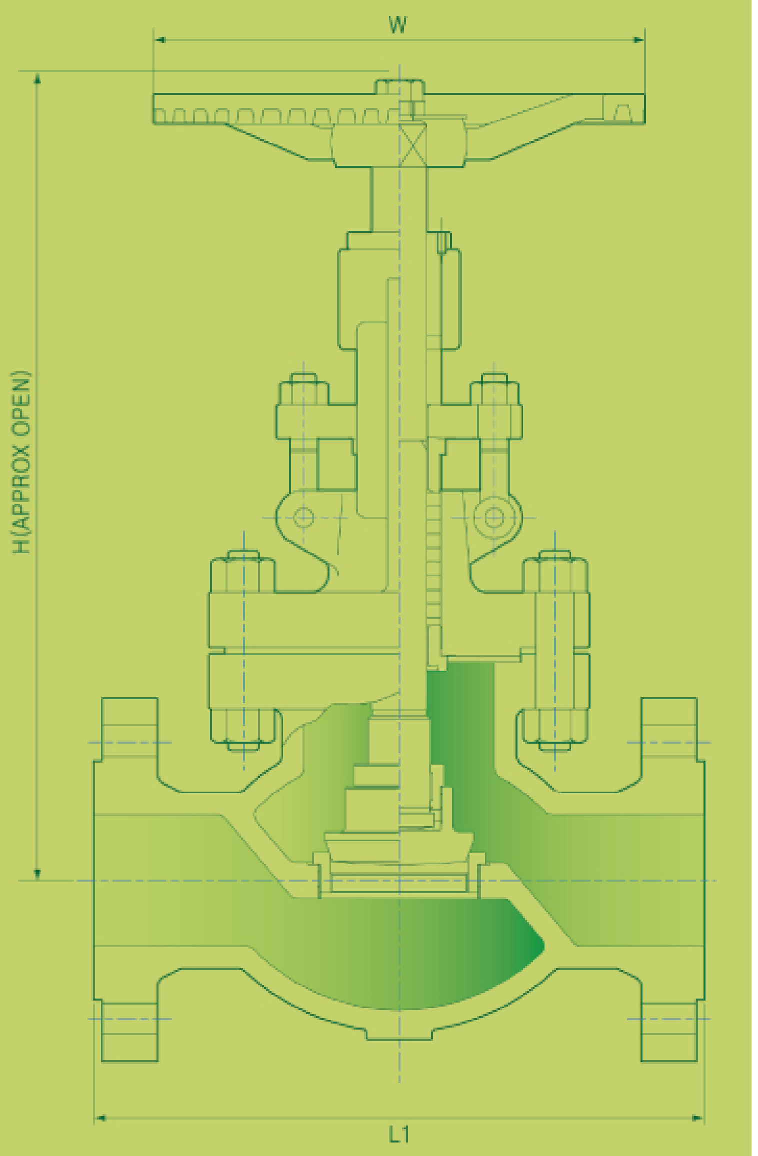


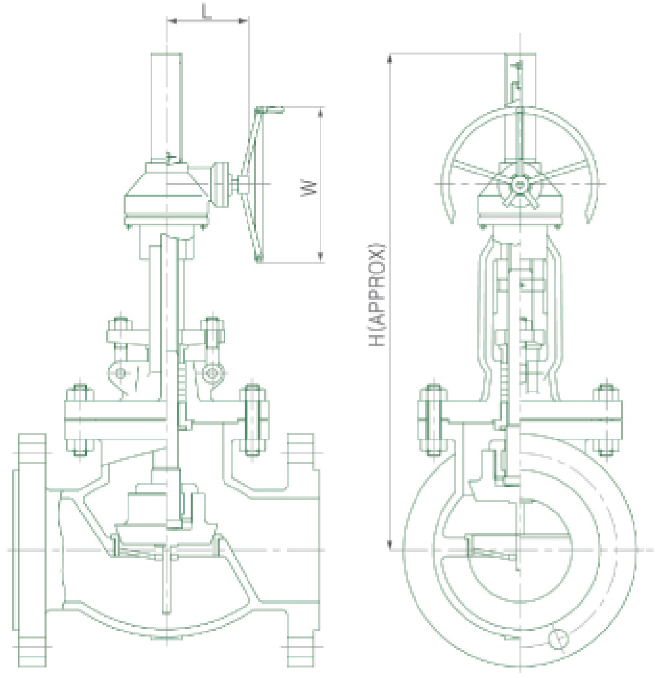


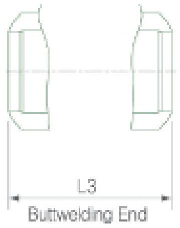
GLOBE VALVES
BOLTED BONNET
CAST STEEL

ASME CLASS 1500LB

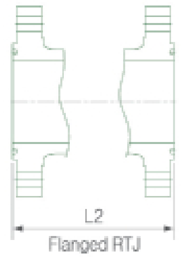
VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14
	mm	50	65	80	100	125	150	200	250	300	350
L1 & L3	inch	14.5	16.5	18.5	21.5	26.5	27.75	32.75	39.0	44.5	49.5
	mm	368	419	470	546	673	705	832	991	1130	1257
L2	inch	14.92	16.62	18.62	21.62	26.61	28.0	33.13	39.38	45.12	50.25
	mm	371	422	473	549	676	711	842	1000	1146	1276
H	inch	27.4	27.4	31.5	40.0	57.1	64.8	77.2	91.0	105.1	126.0
	mm	695	695	799	1015	1450	1645	1960	2310	2670	3200
W	inch	15.7	15.7	19.7	19.7	24.8	28.0	28.0	30.0	30.0	30.0
	mm	400	400	500	500	630	710	710	760	760	760
L	inch	-	-	-	-	-	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	1124.6	1482	4630.5	7055.0	9702.0	11907.0
	Kg	123	155	180	340	510	627	2100	3200	4400	5400







Buttwelding End



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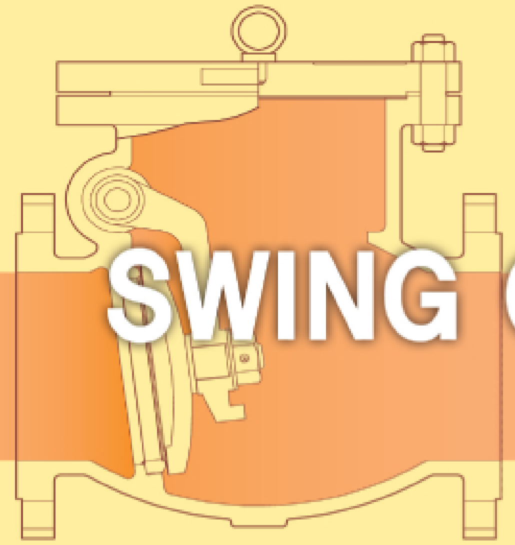
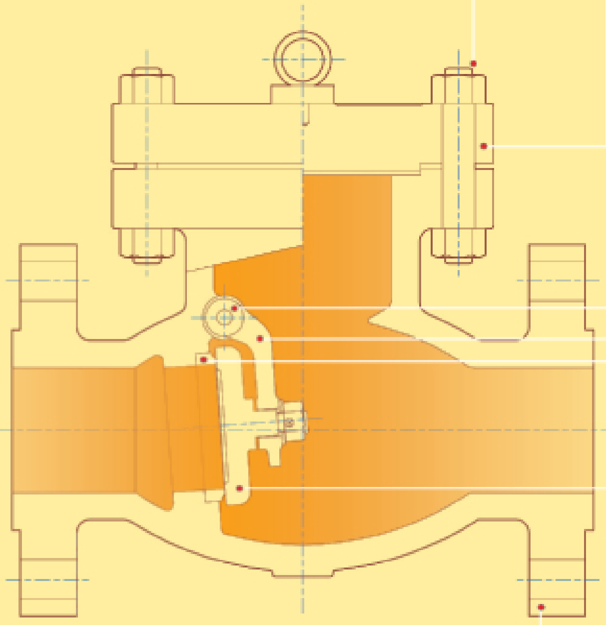


SWING CHECK VALVES

BOLTED COVER

CAST CARBON STEEL

SWING CHECK VALVES BOLTED COVER



BOLTING

The body-cover bolting conforms with ANSI B 1.1
The nuts are manufactured to conform ANSI B 18.2.2

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.

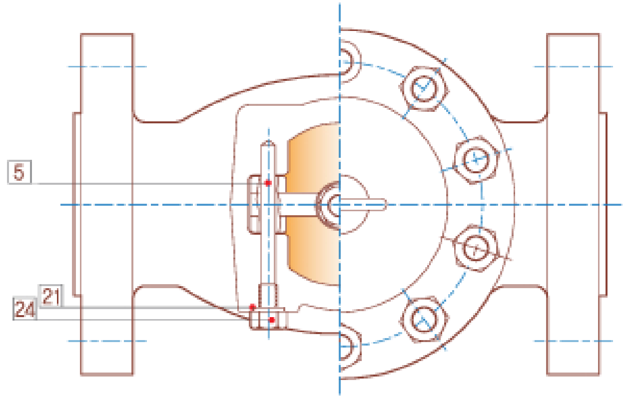
BODY

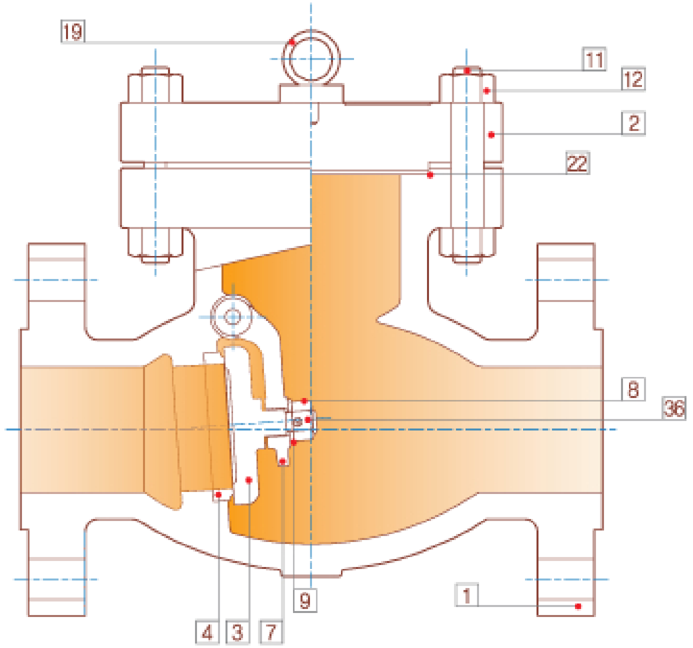
The cast steel body is designed with a wall thickness which is greater at any point than the minimum requirement provided by API Std. 600 or API6D. Port and seat passage dimensions conform to ANSI B 16.5 Pipe Fitting. The welded-in type seat ring is standard to allow interchangeability.
The standard body-bonnet joint is male=female, and the flange is round for all valves.

NO	NAME OF PART	ASTM SPECIFICATION						KS SPEC
		STANDARD	HIGH TEMPERATURE SERVICE				LOW TEMPERATURE SERVICE	STANDARD
1	BODY	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	SCPH2
2	COVER	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	SCPH2
3	* DISC	A217-CA15	A217-WC1	A217-WC6	A217-WC9	A217-C5	A352-LCB	SSC1
4	BODY SEAT RING	C/S1020+HF	A182-F1	A182-F11	A182-F22	A182-F5a	A182-F304	STEEL+HF
5	HINGE PIN	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	STS410
7	ARM	A216-WCB	A216-WC1	A216-WC6	A216-WC9	A216-C5	A352-LCB	SCPH2
11	COVER BOLT	A193-B7	A193-B7	A193-B16	A193-B16	A193-B16	A320-L7	SNB7
12	COVER NUT	A194-2H	A194-2H	A194-4	A194-4	A194-4	A194-4	SM45C

* Note : In case of 12" and larger size, We'll use trim material overlayed one on the same of equivalent material of the Body.

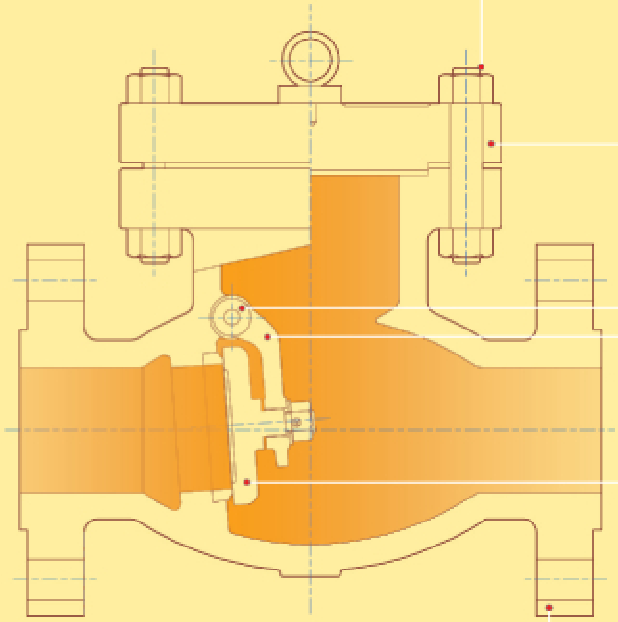
NO	NAME OF PART	ASTM SPECIFICATION
8	DISC NUT	AISI 304
9	DISC WASHER	AISI 304
19	EYE BOLT(6" & OVER)	A307.B
21	PLUG GASKET	A307.B
22	GASKET	SEE PAGE 63
24	PLUG	A307.B
36	SPLIT PIN	AISI 304





CAST STAINLESS STEEL

SWING CHECK VALVES BOLTED COVER



BOLTING

The cover studs and nuts are manufactured from alloy or stainless steel to the relevant ASTM standard.

COVER

The cover is in stainless. The sealing surface for the connection to the body are recessed in the 150 and 300 class and ring joint in the higher classes.

HINGE PIN

The hinge pin is part of the trim. The hinge pin is retained in the body by one threaded plugs and sealed by metallic or non-asbestos. The pin can be easily removed for maintenance of the valve.

ARM

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

DISC

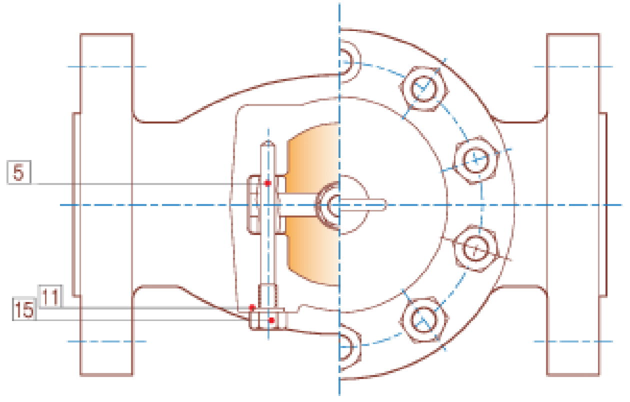
The disc is part of the trim. The backside has a threaded stud for attachment to the hinge with a stainless steel nut and split pin to insure a strong connection. The seating face is ground and lapped, for a perfectly tight seal.

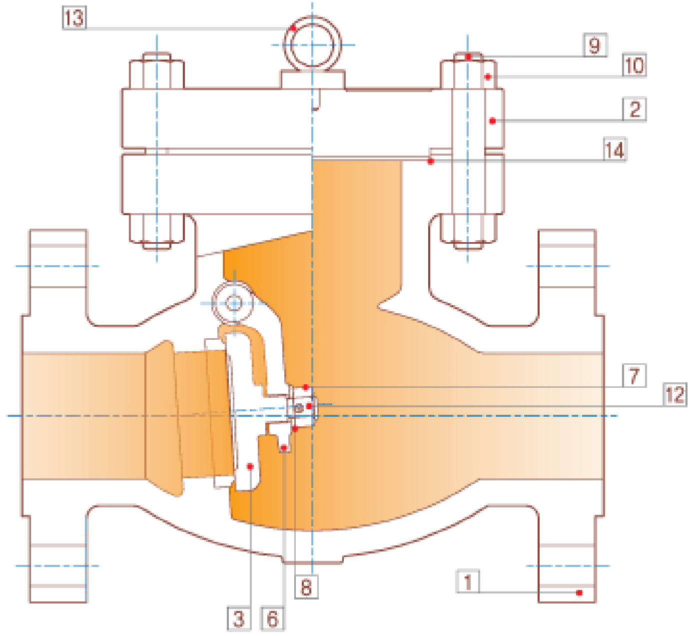
BODY

The body is in stainless steel, carefully designed to keep pressure drops to a minimum. A wide opening on top of the body permits easy inspection and maintenance. The basic dimension, i.e.wall thickness, face to face and flanges, comply with the relevant API and ANSI standards. The body-to-cover flange is circular. Threaded bosses are incorporated to ensued correct alignment of the hinge pin. Bosses may be provided for drain taps or by-pass piping.

NO	NAME OF PART	ASTM SPECIFICATION CORROSION SERVICE				REMARKS
1	BODY	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M	
2	COVER	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M	
3	DISC	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M	
5	HINGE PIN	A276-304	A276-316	A276-304L	A276-316L	
6	ARM	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M	
7	DISC NUT	A194-8	A194-8M	A194-8M	A194-8M	
8	WASHER	A240-304	A240-316	A240-304L	A240-316L	
9	COVER BOLT	A193-B8	A193-B8	A193-B8	A193-B8	
10	COVER NUT	A194-8	A194-8	A194-8	A194-8	
11	PLUG GASKET	COMMERCIAL	COMMERCIAL	COMMERCIAL	COMMERCIAL	
12	SPLIT PIN	A580-304	A580-304	A580-304	A580-304	
13	EYE BOLT(6" & OVER)	A307-B	A307-B	A307-B	A307-B	
14	GASKET	COMMERCIAL	COMMERCIAL	COMMERCIAL	COMMERCIAL	NOTE1
15	PLUG	A276-304	A276-316	A276-304L	A276-316L	

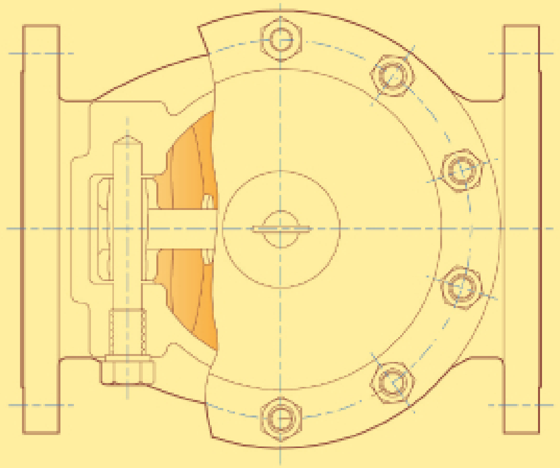
Note 1 : Gasket material : customer's requirements, see page 87

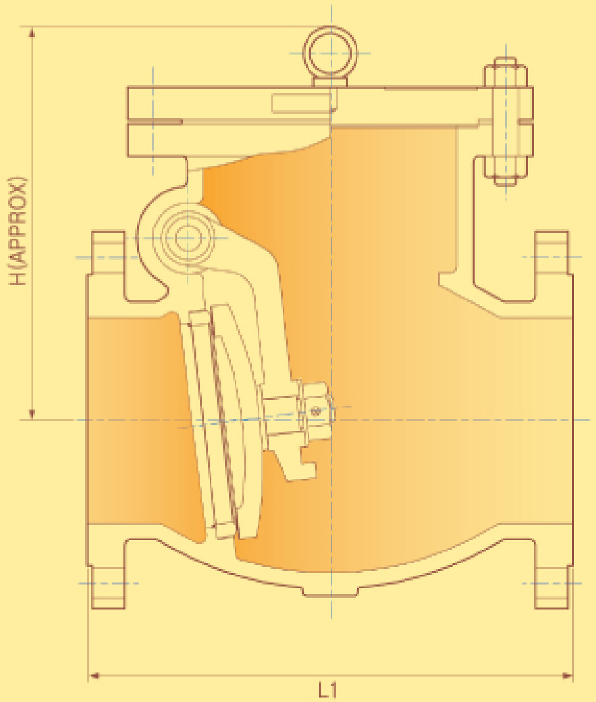


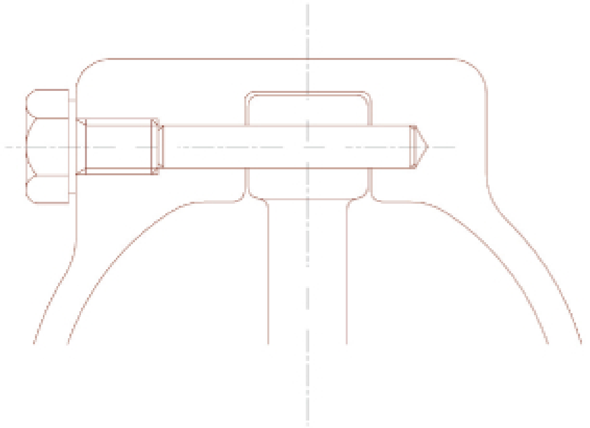


ASME CLASS 150LB

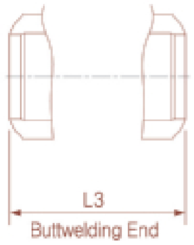
VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	28	30
	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750
L1 & L3	inch	8.0	8.5	9.5	11.5	13.0	14.0	19.5	24.5	27.5	31.0	34.0	38.5	38.5	51.0	57.0	60.0
	mm	203	216	241	292	330	356	495	622	699	787	864	978	978	1295	1448	1524
H	inch	6.1	6.7	7.3	7.9	9.3	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	235	255	305	345	380	460	545	650	670	900	1016	1149
WEIGHT	LB	33.1	48.5	59.5	90.4	143.3	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	65	80	142	177	290	391	461	640	780	1490	2050	2899







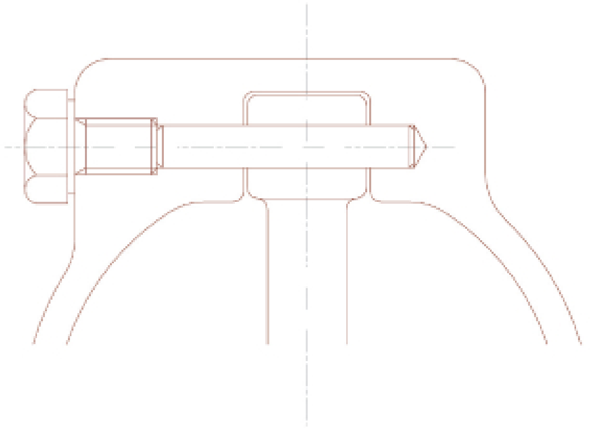
ALL SIZE



Buttwelding End

ASME CLASS 300LB

VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	28
	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700
L1 & L3	inch	10.5	11.5	12.5	14.0	15.75	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	400	444	533	622	711	838	864	978	1016	1346	1499
L2	inch	11.12	12.12	13.12	14.62	16.38	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	416	460	549	638	727	854	880	994	1035	1369	1524
H	inch	6.9	7.5	8.1	8.7	11.6	12.8	14.5	18.6	20.9	22.8	27.4	31.4	30.6	39.6	24.2
	mm	175	190	205	220	295	326	368	473	530	580	695	797	776	1007	1149
WEIGHT	LB	41.9	66.2	77.2	119.1	198.5	282.4	463.1	590.9	915	1503.8	1647.1	2756.3	3307.5	4917.2	6504.8
	Kg	19	30	35	54	90	128	210	268	415	682	747	1250	1500	2230	2950



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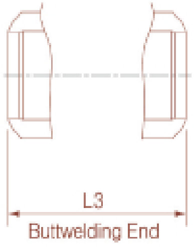

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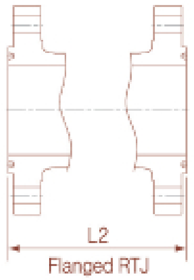

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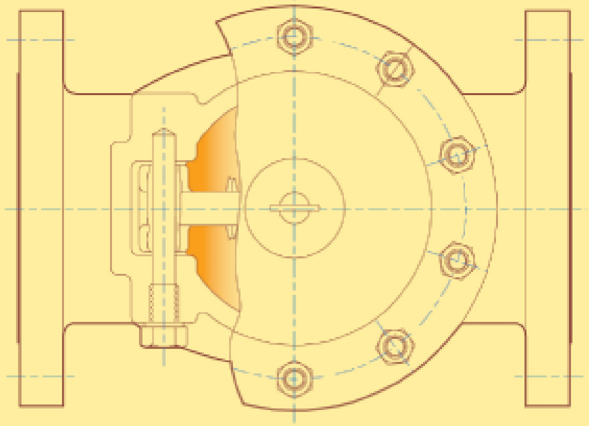
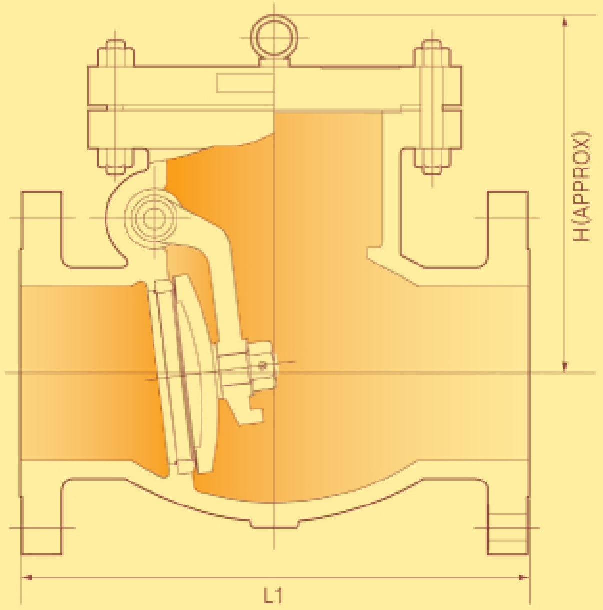
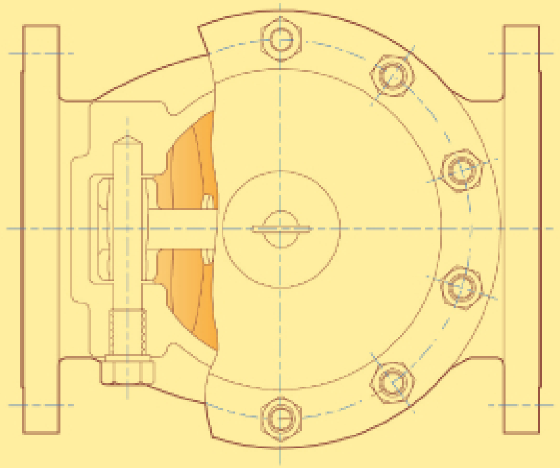
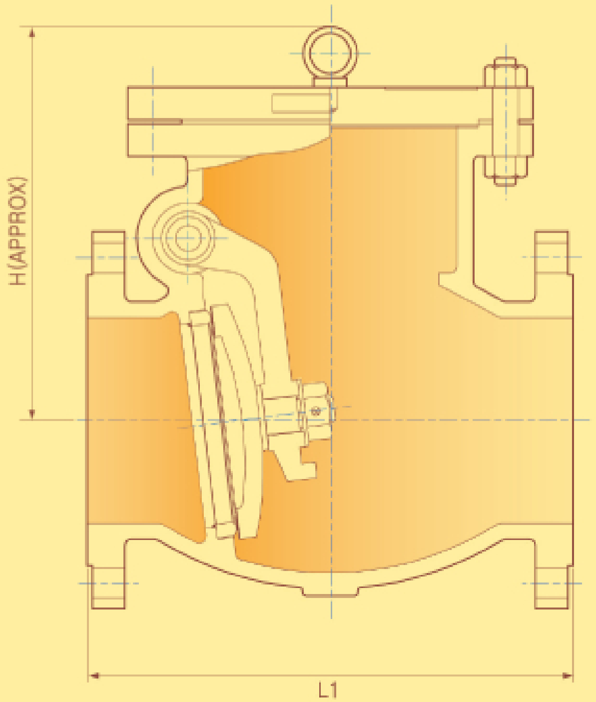


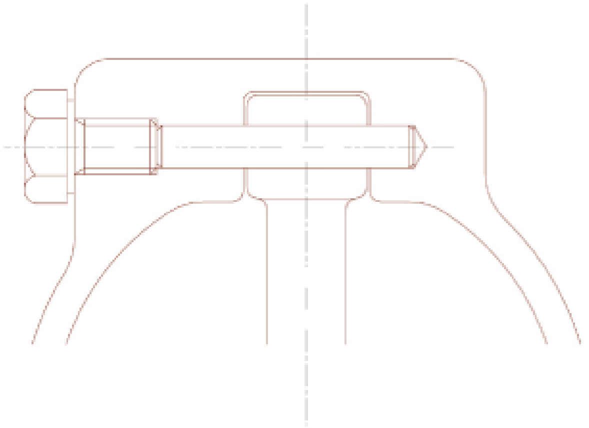


ASME CLASS 600LB

VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14	16	18	20	24
	mm	50	65	80	100	125	150	200	250	300	350	400	450	500	600
L1 & L3	inch	11.5	13.0	14.0	17.0	20.0	22.0	26.0	31.0	33.0	35.0	39.0	43.0	47.0	55.0
	mm	292	330	356	432	508	559	660	787	838	889	991	1092	1194	1397
L2	inch	11.62	13.12	14.12	17.12	20.12	22.12	26.12	31.12	33.12	35.12	39.12	43.12	47.25	55.38
	mm	295	333	359	435	511	562	664	791	841	892	994	1095	1200	1407
H	inch	7.5	8.3	9.6	11.8	13.3	15.7	16.9	20.7	24.2	27.6	32.0	37.8	40.5	457.3
	mm	190	210	235	300	337	400	430	525	615	700	812	960	1029	1202
WEIGHT	LB	77.2	119.1	141.1	229.3	330.8	449.8	793.8	1367.1	1775.0	2306.4	2976.8	4454.1	5269.9	7717.5
	Kg	35	54	64	104	150	204	360	620	805	1045	1350	2020	2390	3500



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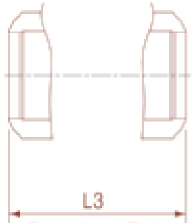

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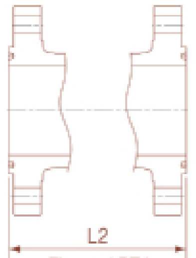

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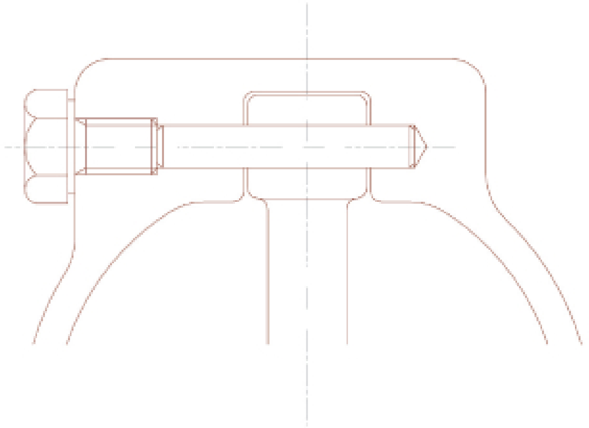
ASME CLASS 900LB

VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14	16
	mm	50	65	80	100	125	150	200	250	300	350	400
L1 & L3	inch	14.5	16.5	15.0	18.0	22.0	24.0	29.0	33.0	38.0	40.5	44.5
	mm	368	419	381	457	559	610	737	838	965	1029	1130
L2	inch	14.62	16.62	15.12	18.12	22.13	24.12	29.12	33.12	38.12	40.88	44.88
	mm	371	422	384	460	562	613	740	841	968	1038	1140
H	inch	13.1	13.7	12.6	16.7	17.4	18.9	22.2	28.3	30.7	31.8	33.0
	mm	333	349	321	423	441	479	565	721	781	807	838
WEIGHT	LB	154.4	242.6	242.6	471.4	735.6	837.9	1375.9	2535.9	3197.3	3858.8	5336.1
	Kg	70	110	110	214	320	380	624	1150	1450	1750	2420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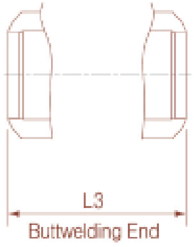

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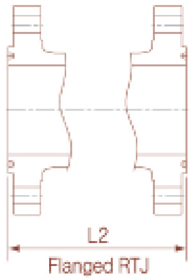

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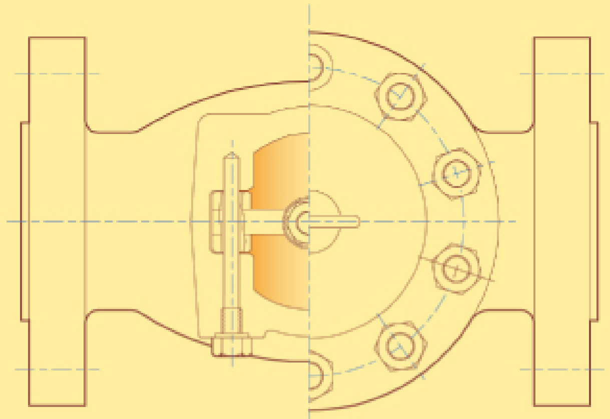
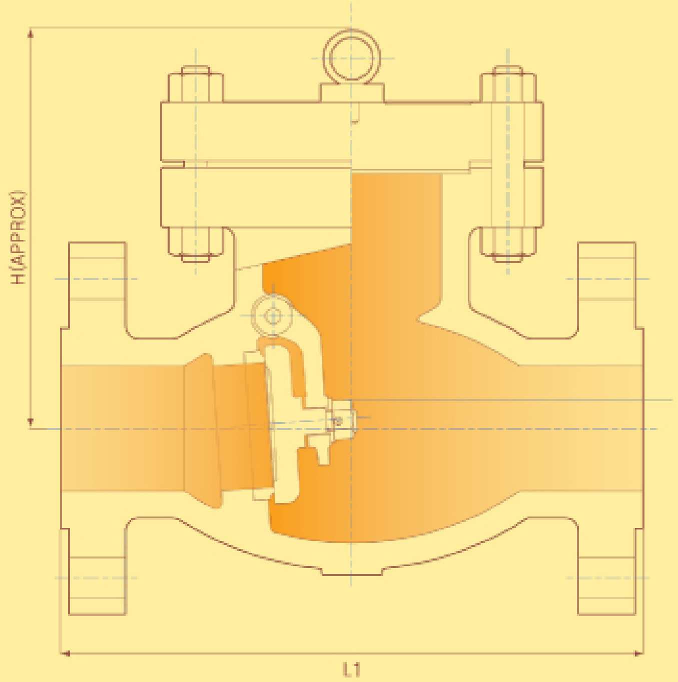
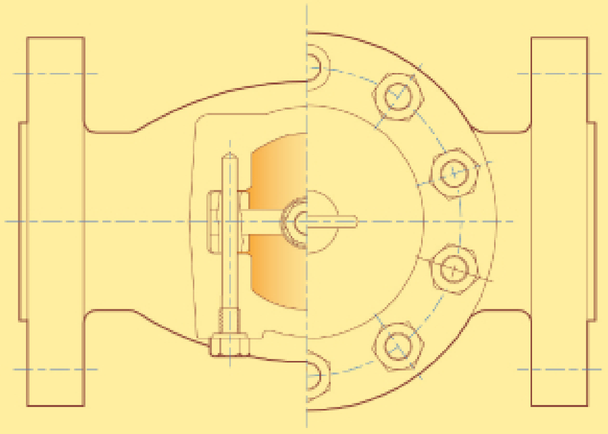
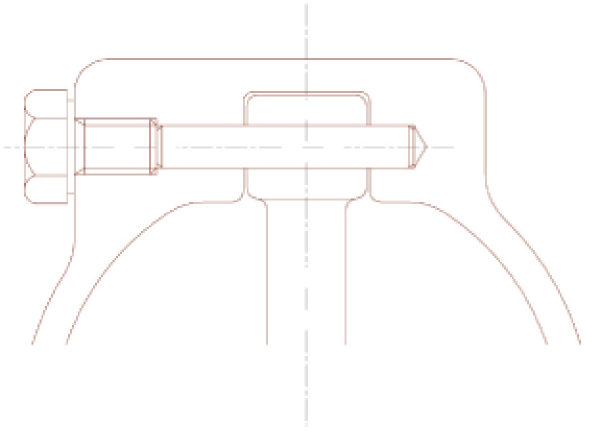




ASME CLASS 1500LB

VALVE SIZE	inch	2	2½	3	4	5	6	8	10	12	14
	mm	50	65	80	100	125	150	200	250	300	350
L1 & L3	inch	14.5	16.5	18.5	21.5	26.5	27.75	32.75	39.0	44.5	49.5
	mm	368	419	470	546	673	705	832	991	1130	1257
L2	inch	14.62	16.62	18.62	21.62	26.61	28.0	33.13	39.38	45.12	50.25
	mm	371	422	473	549	676	711	842	1000	1146	1276
H	inch	13.1	13.7	15.3	16.5	18.9	23.1	26.8	29.8	39.7	40.8
	mm	333	349	389	419	479	587	680	756	1008	1035
WEIGHT	LB	154.4	242.6	374.9	661.5	1036.4	1532.5	2624.0	4079.3	7342.7	7938
	Kg	70	110	170	300	470	695	1190	1850	3330	3600





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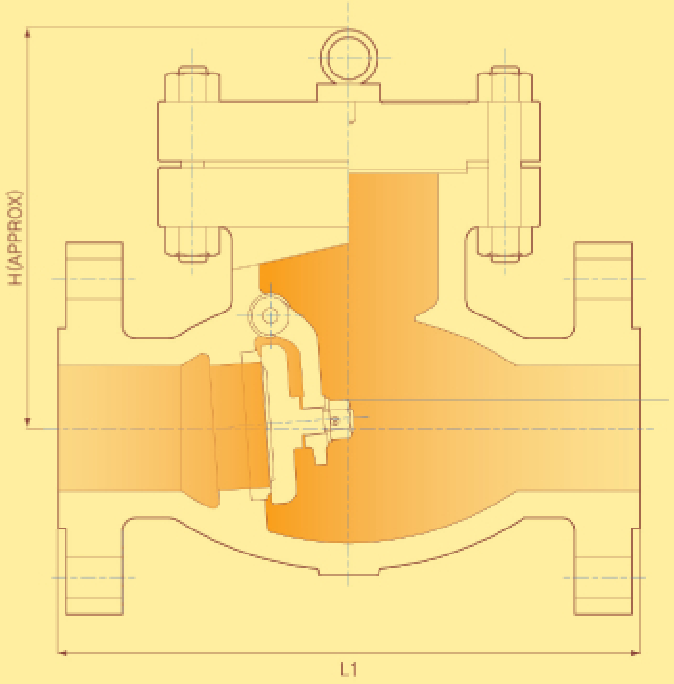

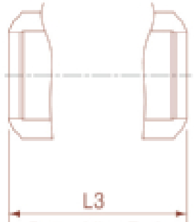

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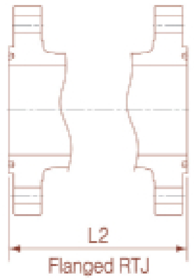

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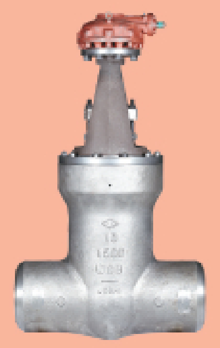
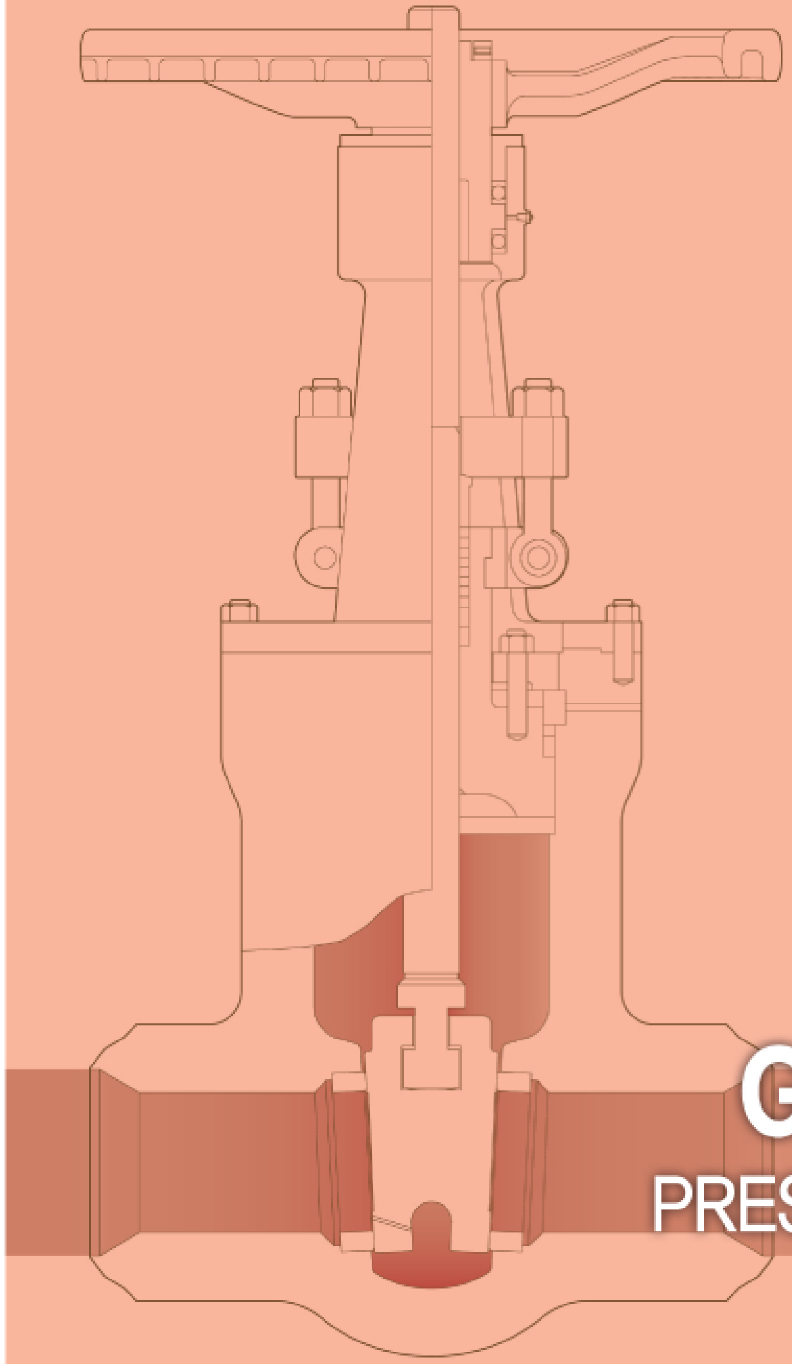


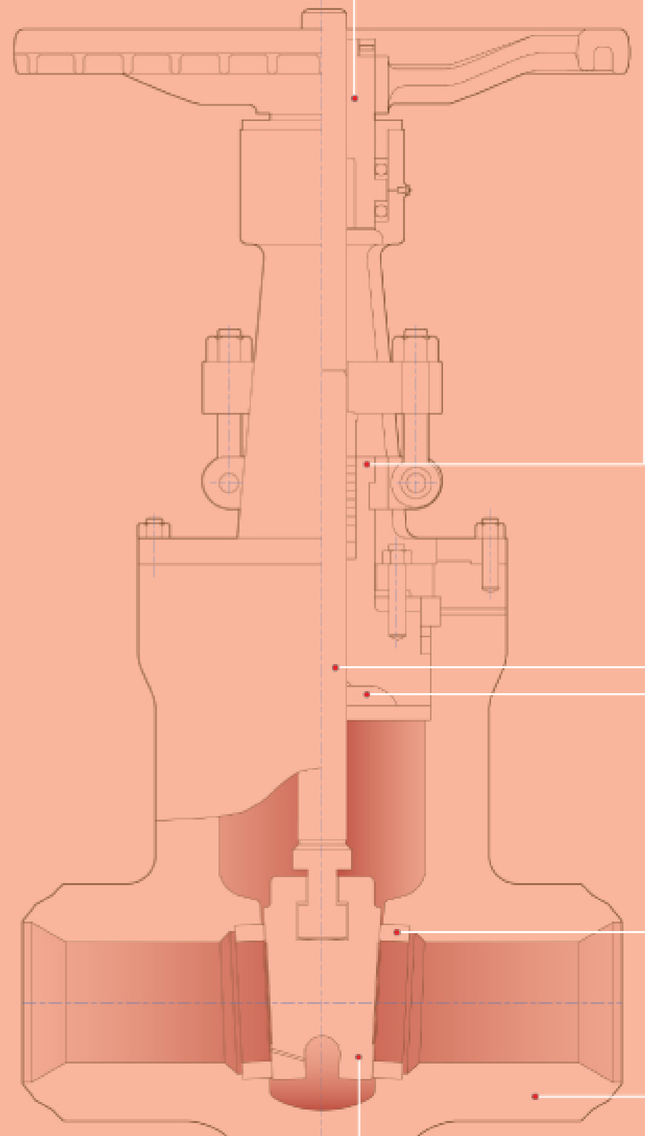


GATE VALVES

PRESSURE SEAL BONNET

CAST STEEL

GATE VALVES PRESSURE SEAL BONNET



STEM NUT

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℃(2100℉) 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 endured, The bodies and bonnets of the valve are machined by special purpose machines to achieve perfect coaxially 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 ensure perfect mating with the wedge surface.

BODY

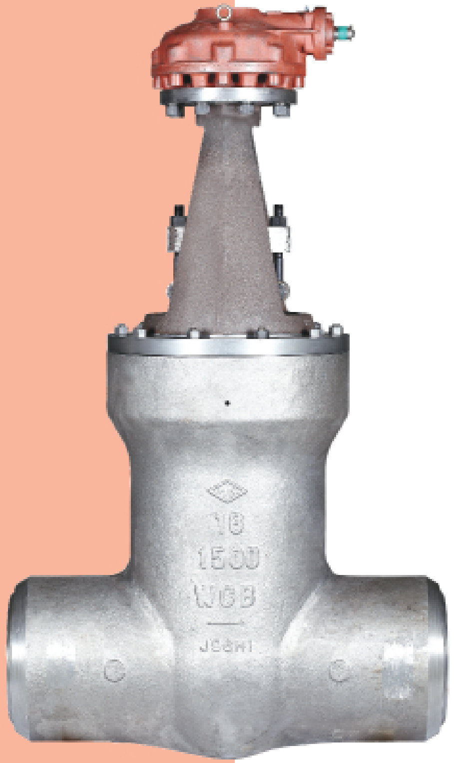
The valve body is cylindrically shaped prevent distortion or undue stress during extreme working conditions. In addition, adequate padding helps to achieve a sound cast structure in critical area. The wall thickness is greater than, or in accordance with API, ANSI and ASME requirements. The contact surfaces 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.

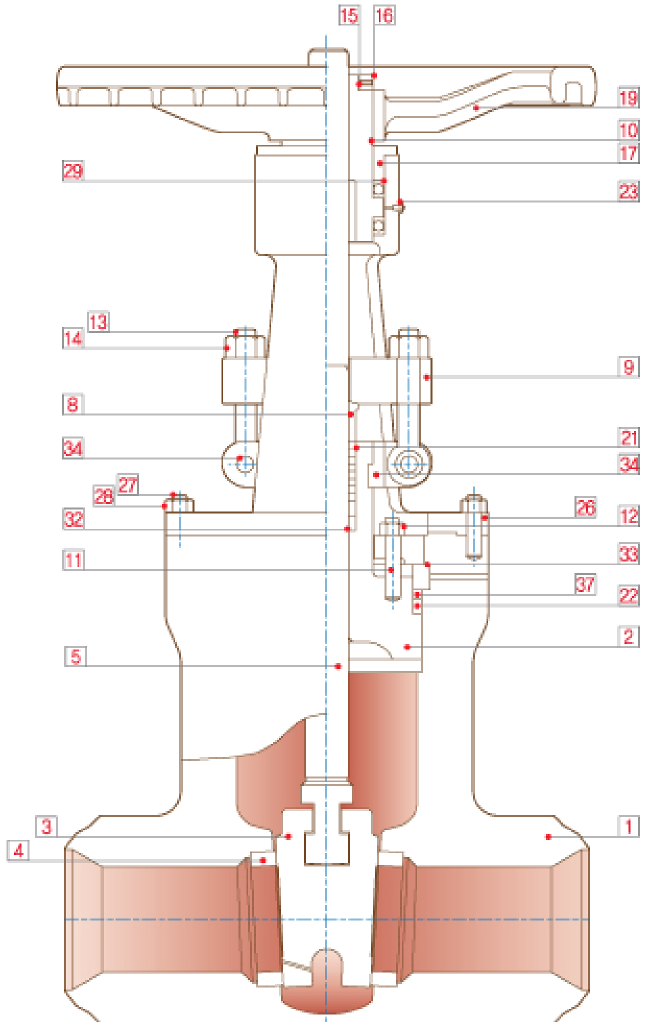
FLEXIBLE WEDGE

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 special heat treatment to secure required hardness and soundness.
The lapped finish then insures perfect mating with the seats.

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	A216-WCB+HF	A217-WC1+HF	A217-WC6+HF	A217-WC9+HF	A217-C5+HF	A352-LCB+304	A352-LC1/LC2/LC3
4	BODY SEAT RING	A105+HF	A182-F1	A182-F11	A182-F22	A182-F5a	A182-F304	A182-F304
5	STEM	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
8	PACKING GLAND	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
9	GLAND FLANGE	A105/A283-D	A105/A283-D	A105/A283-D	A105/A283-D	A105/A283-D	A105/A283-D	A105/A283-D
10	YOKE SLEEVE	A439-D2	A439-D2	A439-D2	A439-D2	A439-D2	A439-D2	A439-D2
11	BONNET BOLT	A193-B7	A193-B7	A193-B16	A193-B16	A193-B16	A320-L7	A320-L7
12	BONNET NUT	A194-2H	A194-2H	A194-4	A194-4	A194-4	A194-4	A194-4
13	GLAND BOLT	A307-B	A307-B	A307-B	A307-B	A307-B	A307-B	A307-B
14	GLAND NUT	A307-B	A307-B	A307-B	A307-B	A307-B	A307-B	A307-B
26	YOKE	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB
27	YOKE BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7
28	YOKE NUT	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H
32	PACKING WASHER	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
33	RETAINER	A240-304	A240-304	A240-304	A240-304	A240-304	A240-304	A240-304
34	HINGE CLAMP	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB
35	BONNET CLAMP	A108-1045	A108-1045	A108-1045	A108-1045	A108-1045	A108-1045	A108-1045
37	GASKET SPACER	A276-410	A276-410	A276-410	A276-410	A276-410	A276-410	A276-410

NO	NAME OF PART	ASTM SPECIFICATION
15	**HANDLE NUT**	STEEL
16	**SET SCREW**	STEEL
17	**SLEEVE GLAND**	STEEL
19	**HANDWHEEL**	A395
21	**PACKING**	SEE PAGE 63
22	**GASKET**	SEE PAGE 63
23	**GREASE NIPPLE**	STEEL
29	**BEARING**	COMMERCIAL

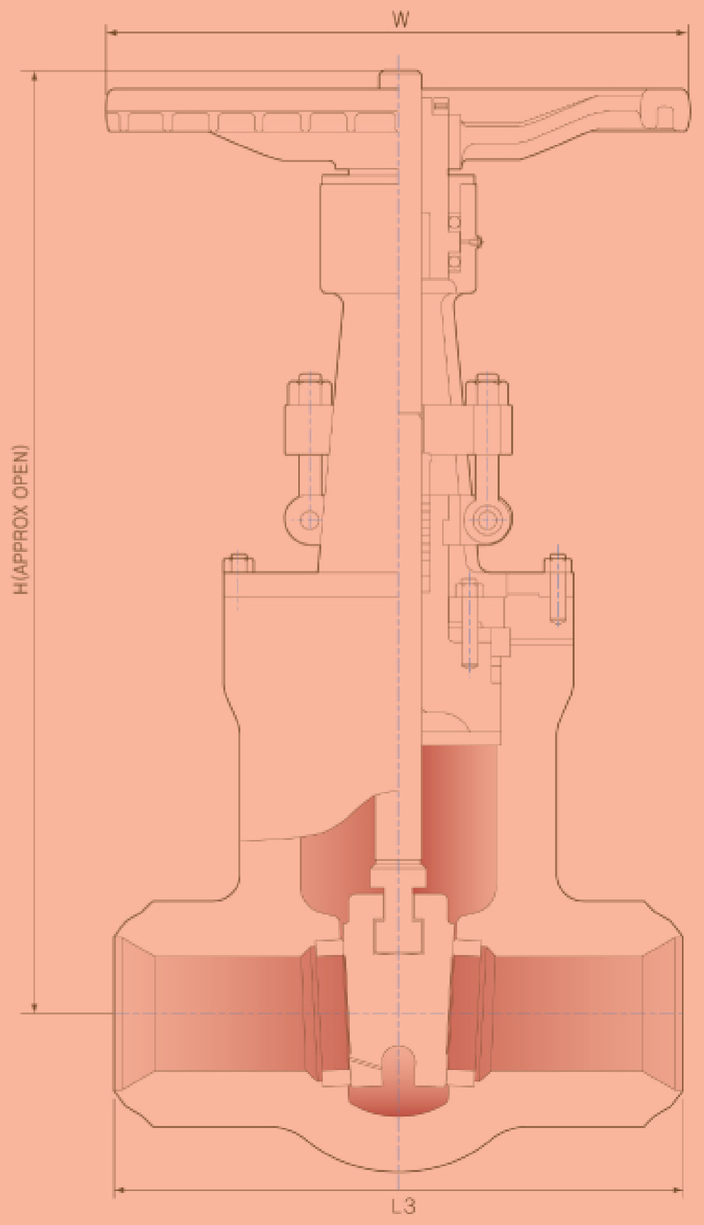


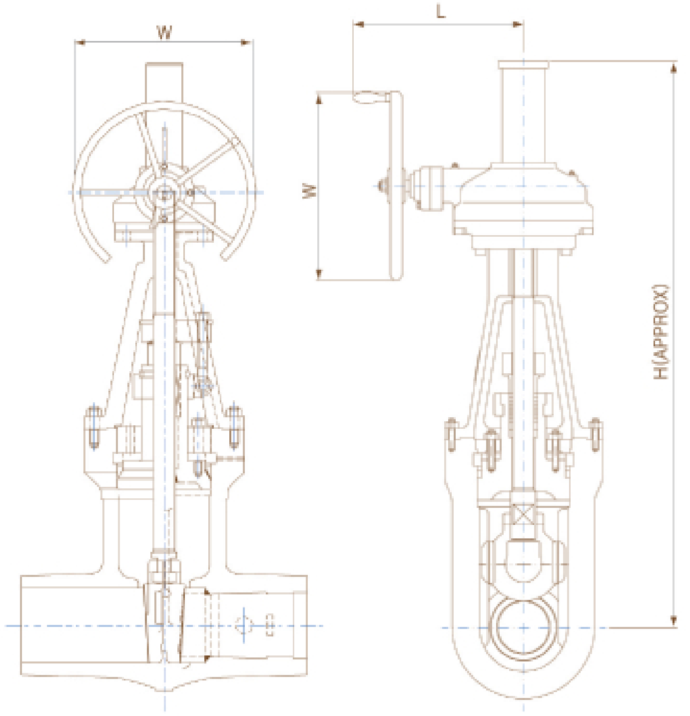


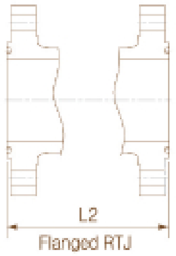
GATE VALVES
PRESSURE SEAL BONNET
CAST STEEL

ASME CLASS 600LB

VALVE SIZE	inch	2	2½	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
L3	inch	7.0	8.5	10.0	12.0	18.0	23.1	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	inch	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
L1	inch	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
H	inch	23.2	24.8	26.3	36.0	42.5	49.9	59.5	70.5	73.1	85.4	88.6	97.2	118.1
	mm	590	629	667	914	1080	1267	1511	1791	1857	2162	2251	2470	3000
W	inch	7.9	93.8	9.8	11.8	19.7	22.0	272.2	35.8	24.0	24.0	24.0	24.0	30.0
	mm	200	250	250	300	500	560	690	610	610	910	610	610	760
L	inch	-	-	-	-	-	-	-	17.0	17.0	20.2	20.2	20.2	21.8
	mm	-	-	-	-	-	-	-	432	432	512	512	512	554
WEIGHT	LB	154.4	209.5	220.5	326.3	540.2	705.6	948.2	1135.6	1477.4	2535.8	2535.8	3186.2	4586.4
	Kg	70	95	100	148	245	320	430	515	670	1150	1150	1445	2080






L2
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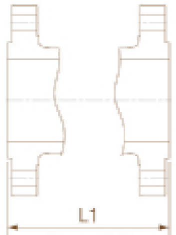
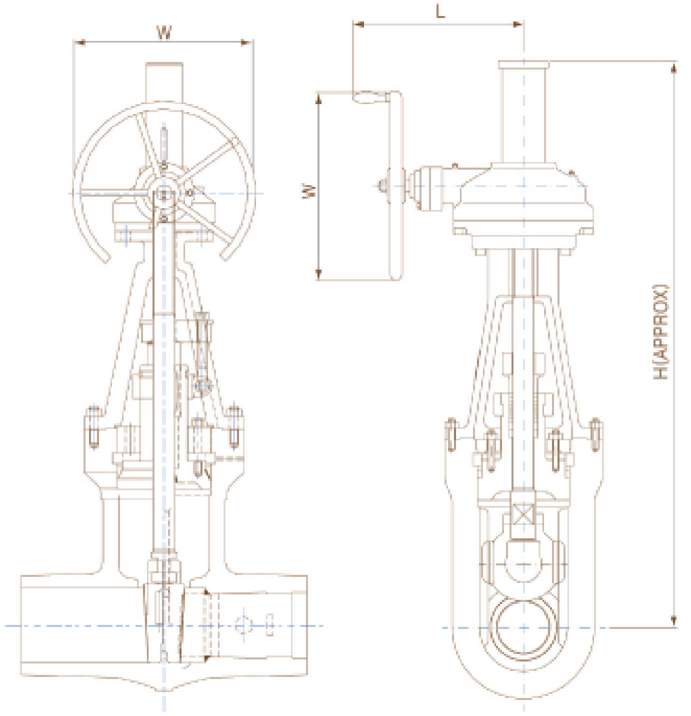
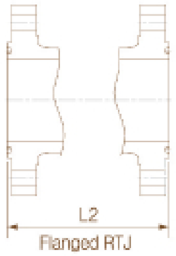
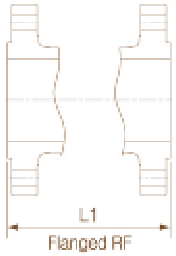

L1
Flanged RF



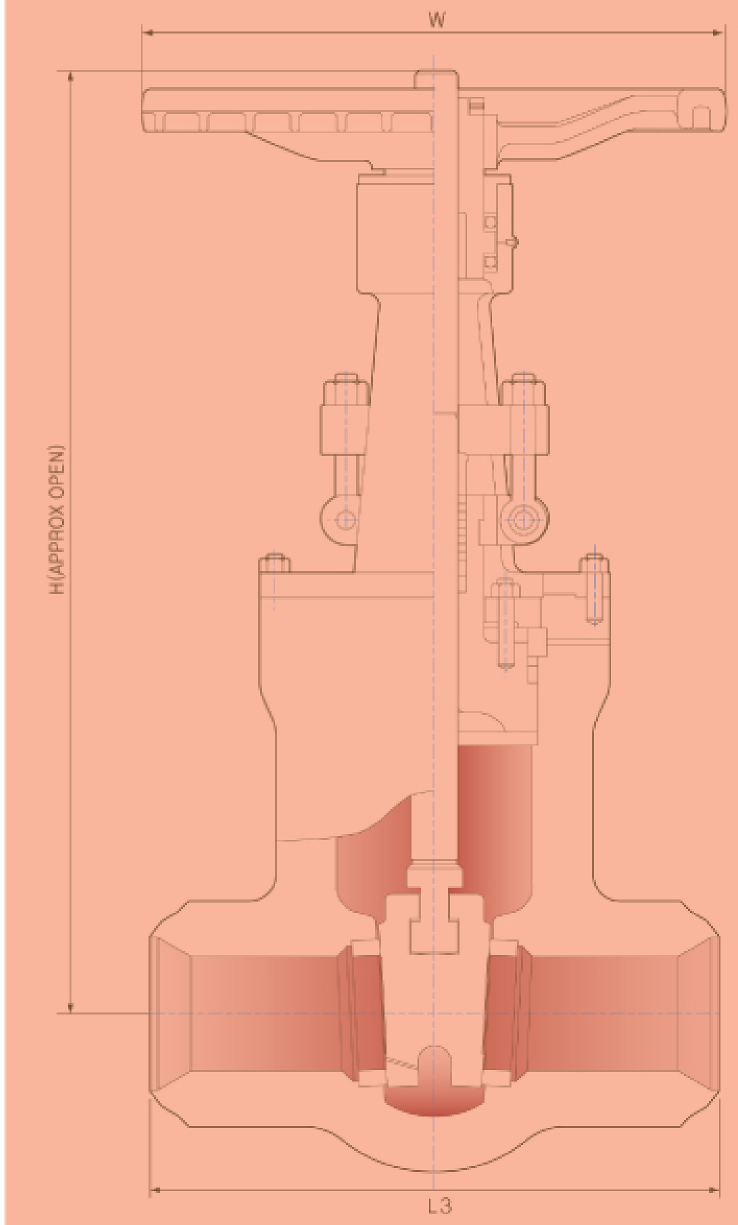

L2
Flanged RTJ


L1
Flanged RF

ASME CLASS 900LB

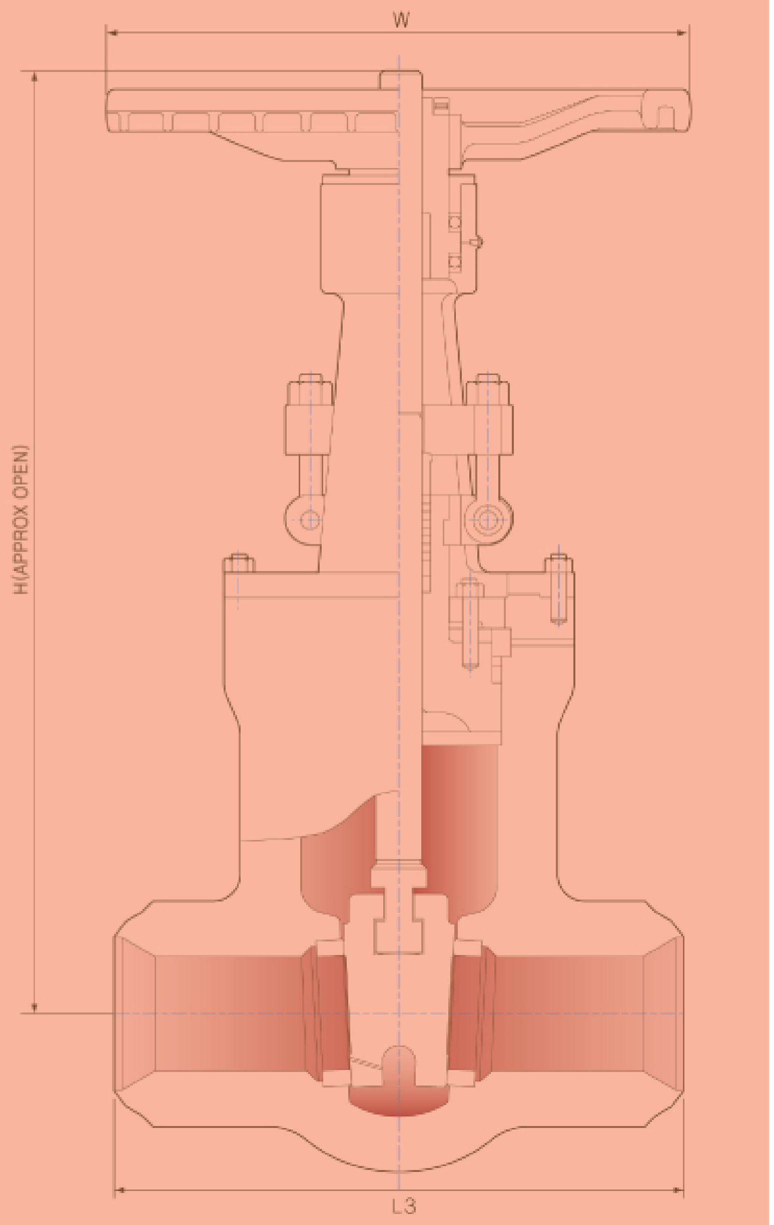
VALVE SIZE	inch	2	2½	3	4	6	8	10	12	14	16	18	20	24
	mm	50	65	80	100	150	200	250	300	350	400	450	500	600
L3	inch	8.5	10.0	12.0	14.0	20.0	26.0	31.0	36.0	39.0	43.0	46.5	50.5	59.5
	mm	216	254	305	356	508	660	787	914	991	1092	1181	1283	1511
L2	inch	14.62	16.62	15.12	18.12	24.12	29.12	33.12	38.12	40.88	44.88	48.5	52.5	61.75
	mm	371	422	384	460	613	740	841	968	1038	1140	1232	1334	1568
L1	inch	14.5	165.5	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
H	inch	23.4	29.6	29.8	34.0	39.9	50.2	60.7	70.1	79.8	89.0	97.2	108.3	1276.6
	mm	594	753	756	864	1013	1276	1543	1781	2026	2261	2470	2750	3242
W	inch	11.8	17.7	17.7	19.7	220	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	inch	-	-	-	-	-	116.8	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

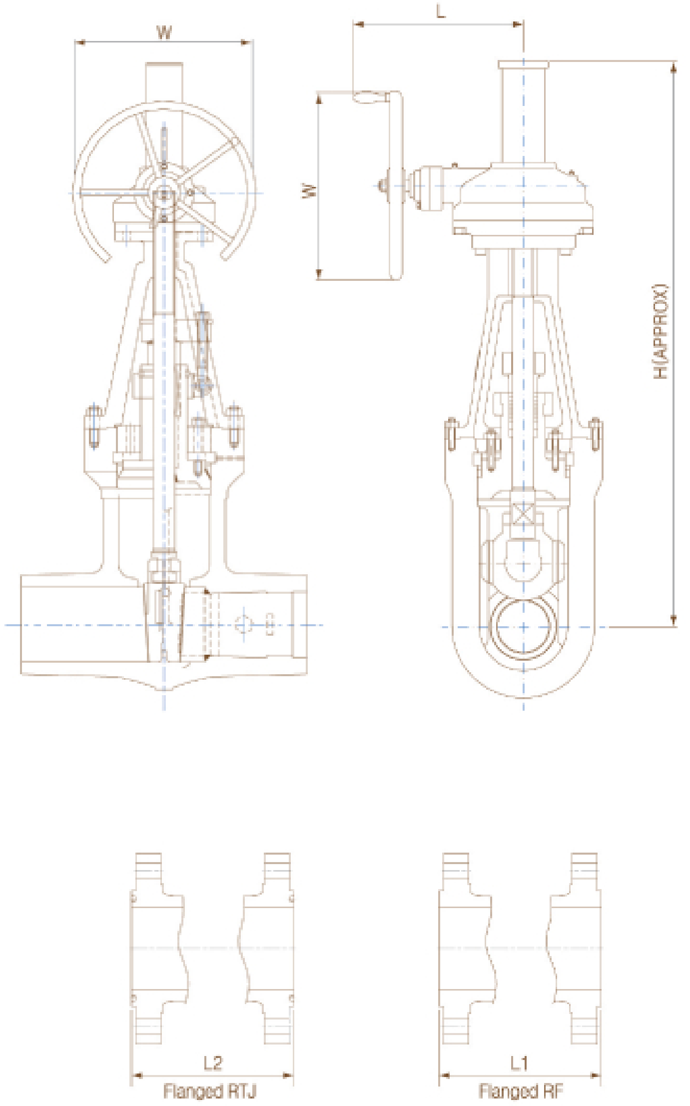
GATE VALVES
PRESSURE SEAL BONNET
CAST STEEL



ASME CLASS 1500LB

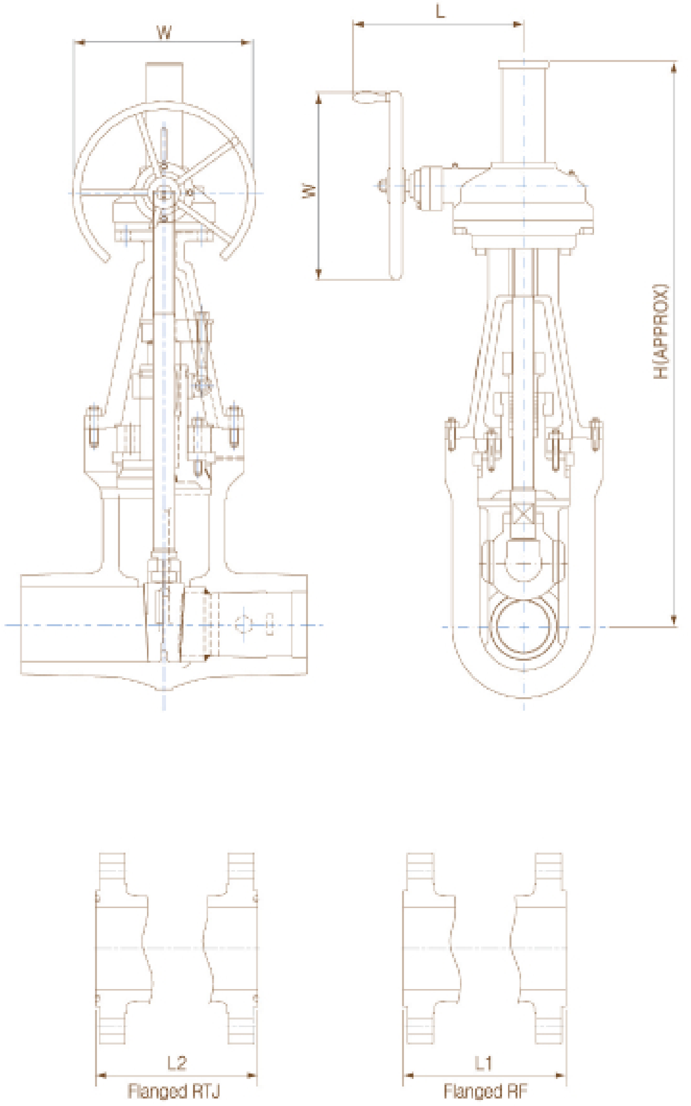
VALVE SIZE	inch	2	2½	3	4	6	8	10	12	14	16
	mm	50	65	80	100	150	200	250	300	350	400
L3	inch	8.5	10.0	12.0	16.0	22.0	28.0	34.0	39.0	42.0	47.0
	mm	216	254	305	406	559	711	864	991	1067	1194
L2	inch	14.62	16.62	18.62	21.62	28.0	33.16	39.38	45.12	5025	55.38
	mm	371	422	473	549	711	842	1000	1146	1276	1407
L1	inch	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
H	inch	23.4	29.6	29.6	34.0	48.2	51.6	64.8	77.8	87.2	91.8
	mm	594	753	753	864	1219	1311	1645	1975	2216	2331
W	inch	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	inch	-	-	-	-	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	5379.5	7933
	Kg	60	94	120	208	480	910	1410	2080	2650	3600

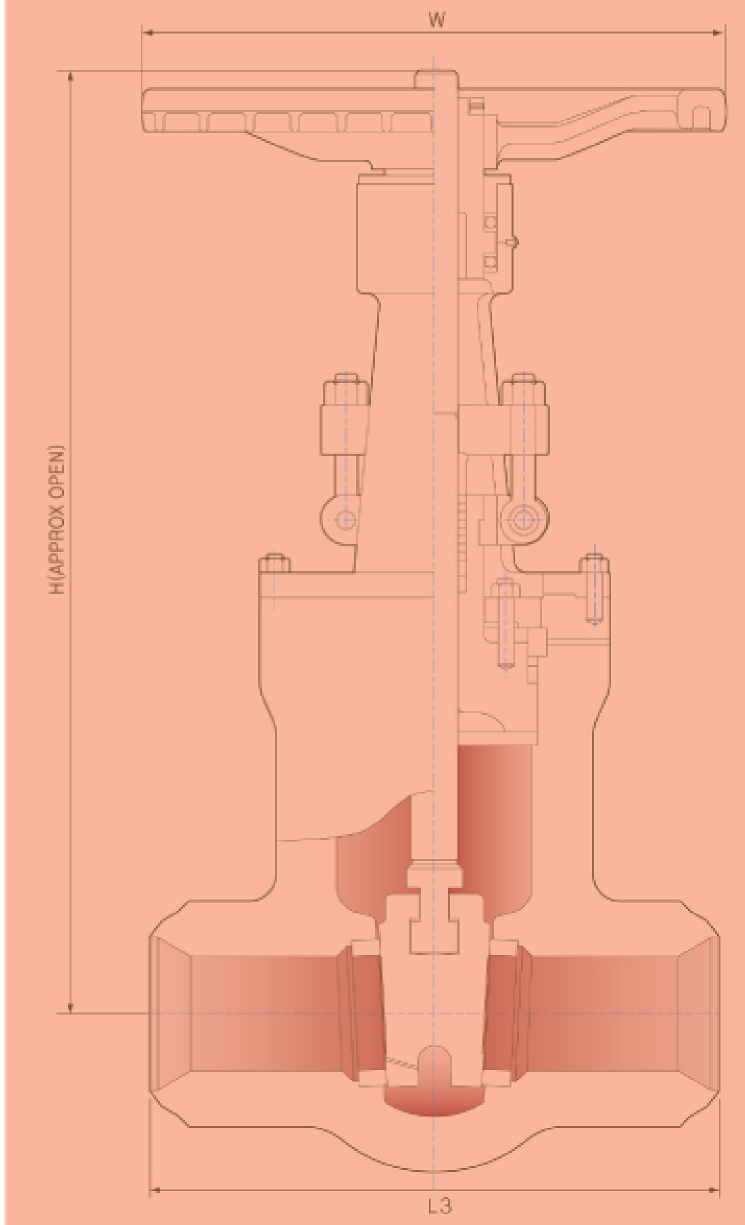


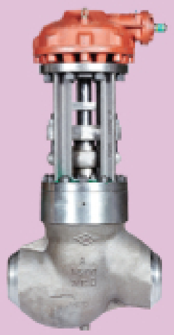


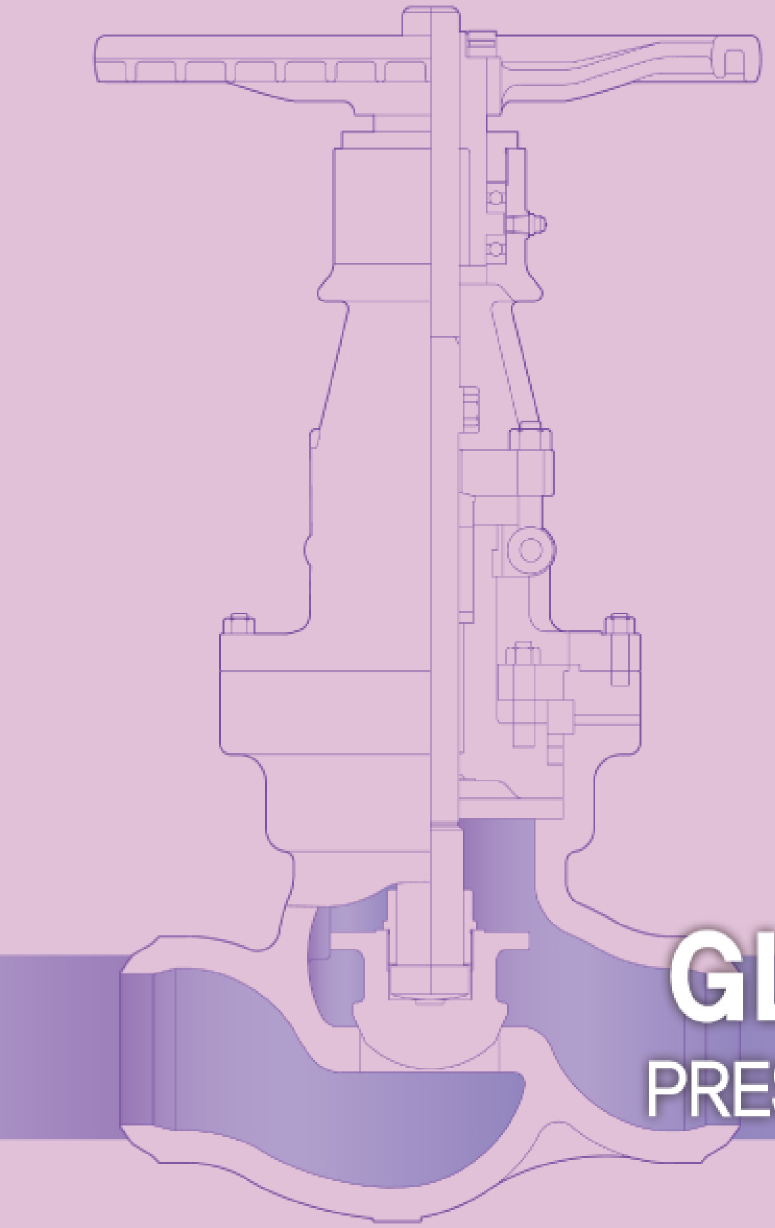
ASME CLASS 2500LB

VALVE SIZE	inch	2	2½	3	4	6	8	10	12	14	16	18
	mm	50	65	80	100	150	200	250	300	350	400	450
L3	inch	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
L2	inch	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	-	-	-
L1	inch	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	-	-	-
H	inch	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	inch	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	76	610	610
L	inch	-	-	-	-	17.0	20.2	20.2	21.8	21.8	20.2	20.2
	mm	-	-	-	-	432	512	512	554	554	512	512
WEIGHT	LB	172.1	273.4	334.1	568.4	954.1	1806.7	2943.5	4466.0	6902.0	10353.0	11774.0
	Kg	85	135	165	280	470	890	1450	2200	3400	5100	5800



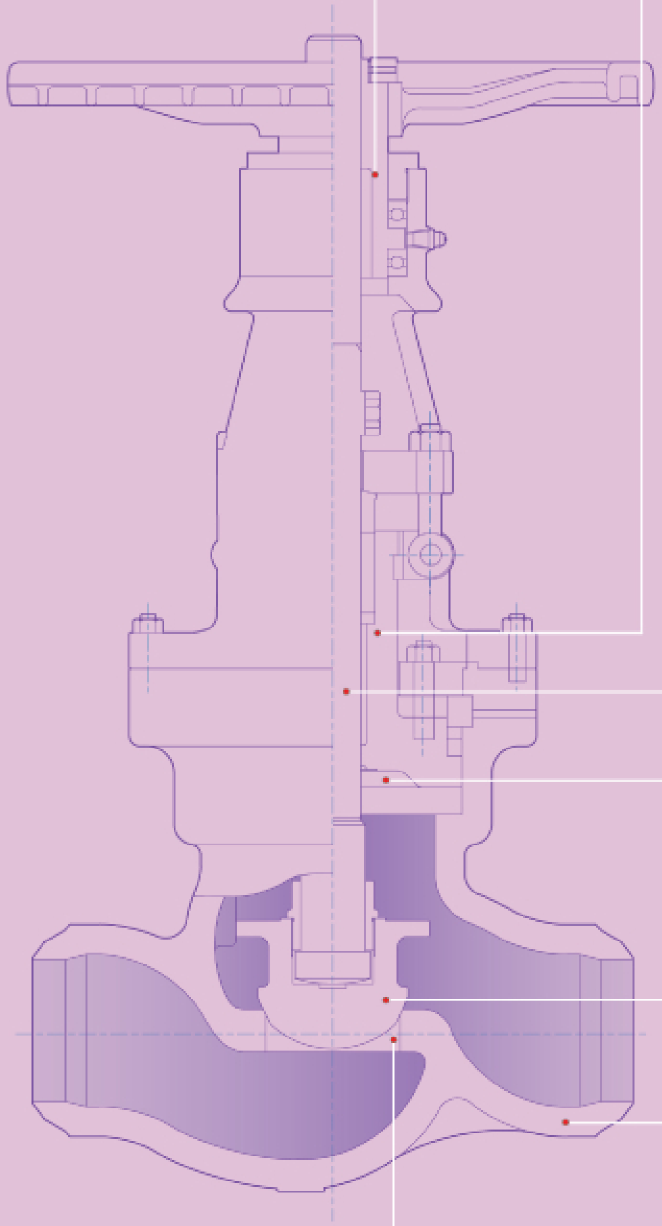






GLOBE VALVES
PRESSURE SEAL BONNET

CAST STEEL
GLOBE VALVES PRESSURE SEAL BONNET



YOKE SLEEVE

The standard material of the Yoke Sleeve is Nodular Ni-resist D2 with over 1150℃(2100℉) 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 a 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.

BODY

The cylindrically shaped valve body prevents distortion or undue stress under extreme working conditions. In addition, adequate padding enduress 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 gas a stainless steel 18/8 inlay eliminate corrosion or wire drawing The close tolerances of the inside diameter of this area attained by accurate machining and holding finish.

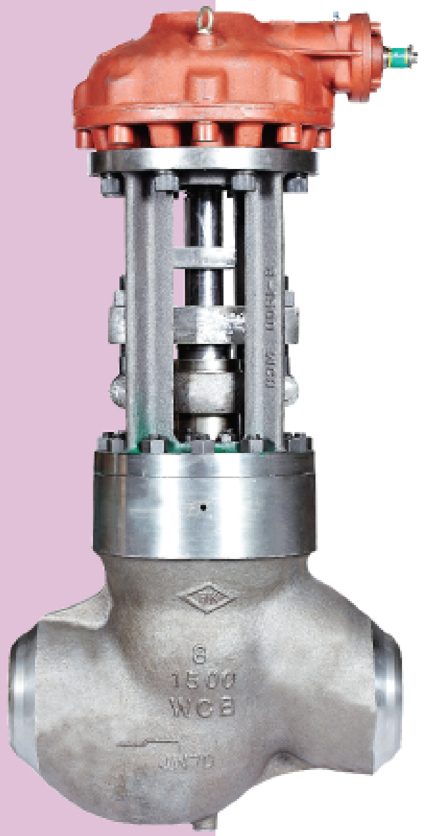
SEAT

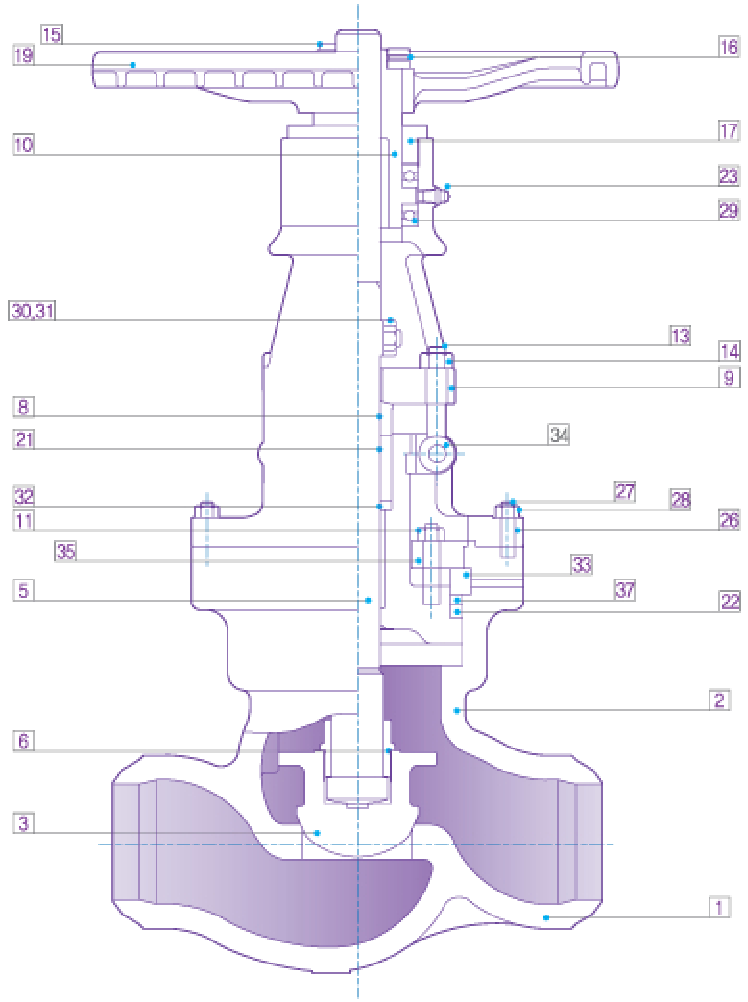
The stellite 6 seating surface is integrally applide to the body by means of welding in all valve sizes. Perfect mating the disc surfaces is achieved by lapping applied to the seating surface.

GLOBE VALVES PRESSURE SEAL BONNET
CAST STEEL

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	A216-WCB+HF	A217-WC1+HF	A217-WC6+HF	A217-WC9+HF	A217-C5+HF	A352-LCB+304	A352-LC1/LC2/LC3
5	STEM	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
6	DISC GLAND	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
8	PACKING GLAND	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
9	GLAND FLANGE	A283-D	A283-D	A283-D	A283-D	A283-D	A283-D	A283-D
10	YOKE SLEEVE	A439-D2	A439-D2	A439-D2	A439-D2	A439-D2	A439-D2	A439-D2
11	BONNET FLANGE BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A320-L7	A320-L7
13	GLAND BOLT	A307-B	A307-B	A307-B	A307-B	A307-B	A307-B	A307-B
14	GLAND NUT	A307-B	A307-B	A307-B	A307-B	A307-B	A307-B	A307-B
26	YOKE	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB
27	YOKE BOLT	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7	A193-B7
28	YOKE NUT	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H	A194-2H
31	STOPPER PIN	A307-B	A307-B	A307-B	A307-B	A307-B	A307-B	A307-B
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-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB
35	BONNET CLAMP	A108-1045	A108-1045	A108-1045	A108-1045	A108-1045	A108-1045	A108-1045
37	GASKET SPACER	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304

NO	NAME OF PART	ASTM SPECIFICATION
15	**HANDLE NUT**	STEEL
16	**SET SCREW**	STEEL
19	**HANDWHEEL**	A395
21	**PACKING**	SEE PAGE 63
22	**GASKET**	SEE PAGE 63
30	**STOPPER**	A283-D

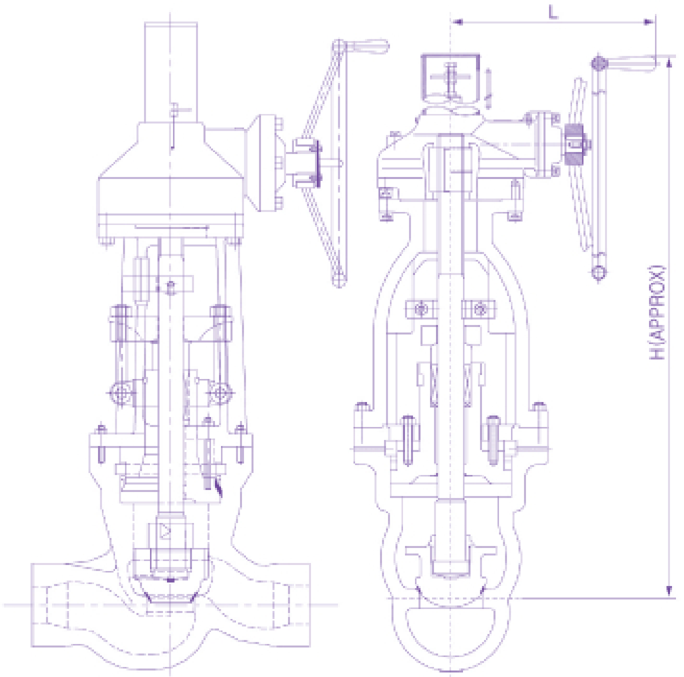


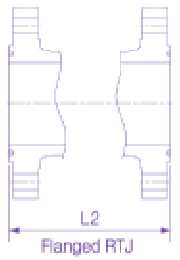


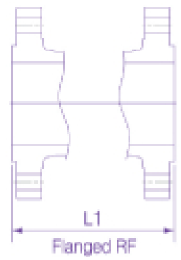
ASME CLASS 600LB

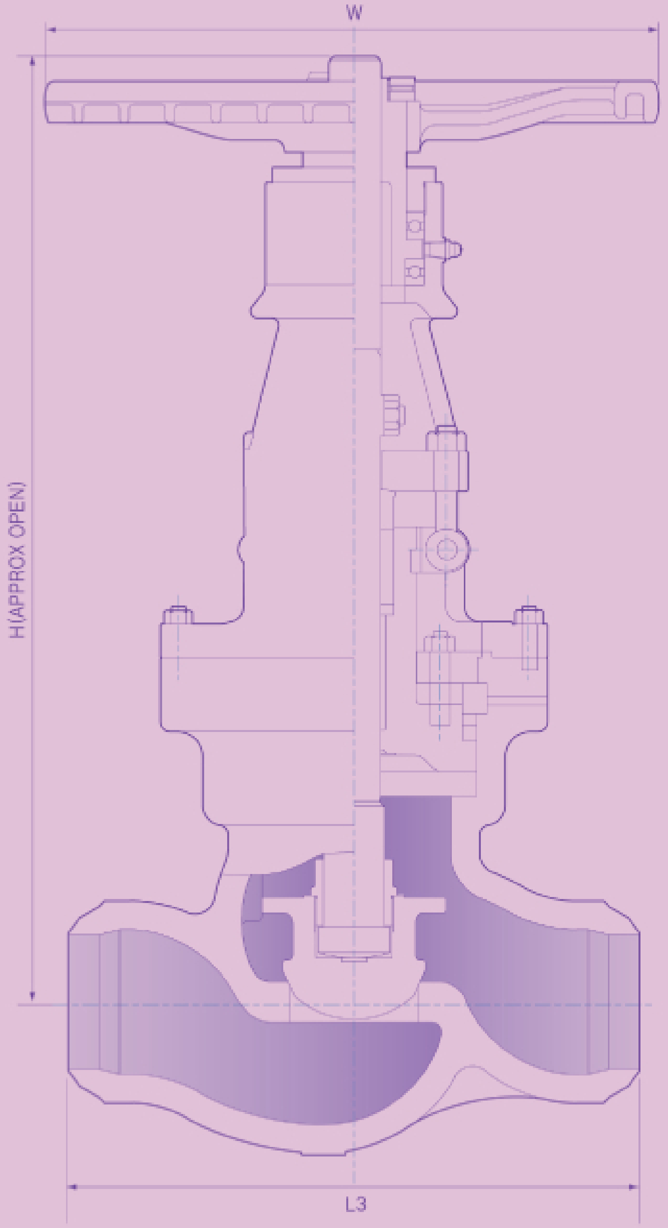
VALVE SIZE	inch	2	2½	3	4	6	8	10	12	14	16
	mm	50	65	80	100	150	200	250	300	350	400
L3	inch	7.0	8.5	10.0	12.0	18.0	23.0	28.0	32.0	35.0	39.0
	mm	178	216	254	305	457	584	711	813	889	991
L2	inch	11.62	13.12	14.12	17.12	22.12	26.12	31.12	33.12	35.12	39.12
	mm	295	333	359	435	562	664	791	841	892	994
L1	inch	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	838	889	991
H	inch	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	inch	9.8	11.8	11.8	17.7	23.6	18.1	24.0	24.0	24.0	29.9
	mm	250	330	300	450	600	460	610	610	610	760
L	inch	-	-	-	-	-	20.2	17.0	20.2	20.2	22.3
	mm	-	-	-	-	-	512	432	512	512	567
WEIGHT	LB	992	121.2	187.4	297.7	672.5	1367.1	2883.6	4189.5	5997.6	6945.8
	Kg	45	55	85	135	305	620	1310	1900	2720	3150

GLOBE VALVES PRESSURE SEAL BONNET
CAST STEEL



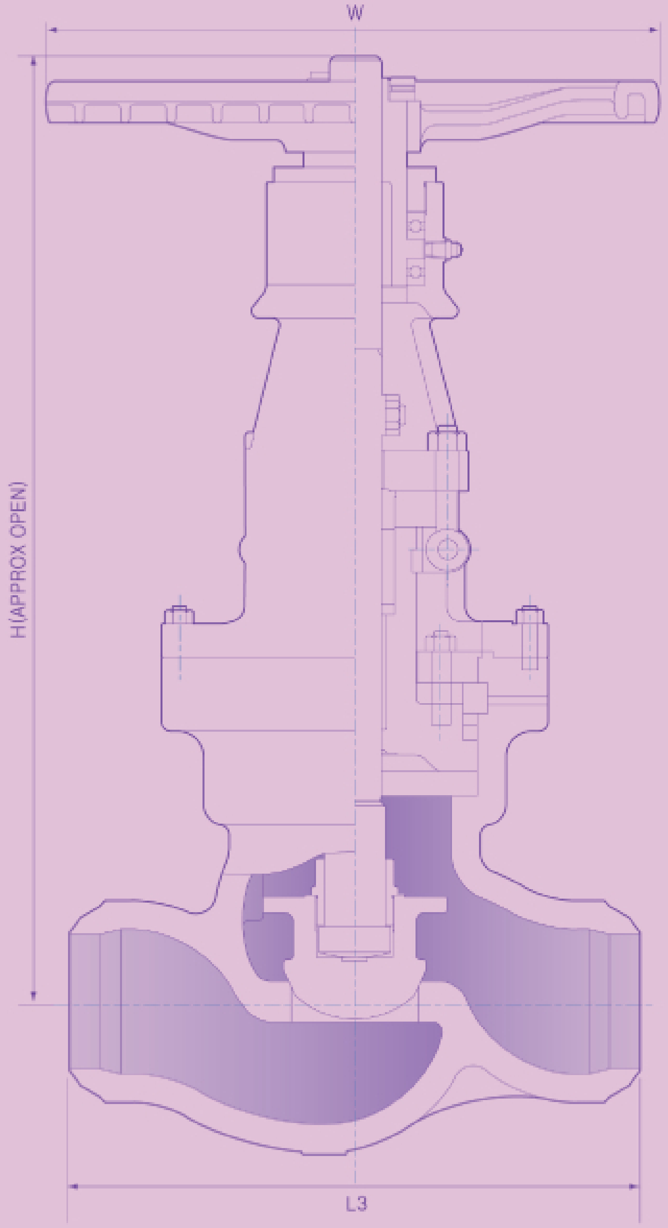

L2
Flanged RTJ

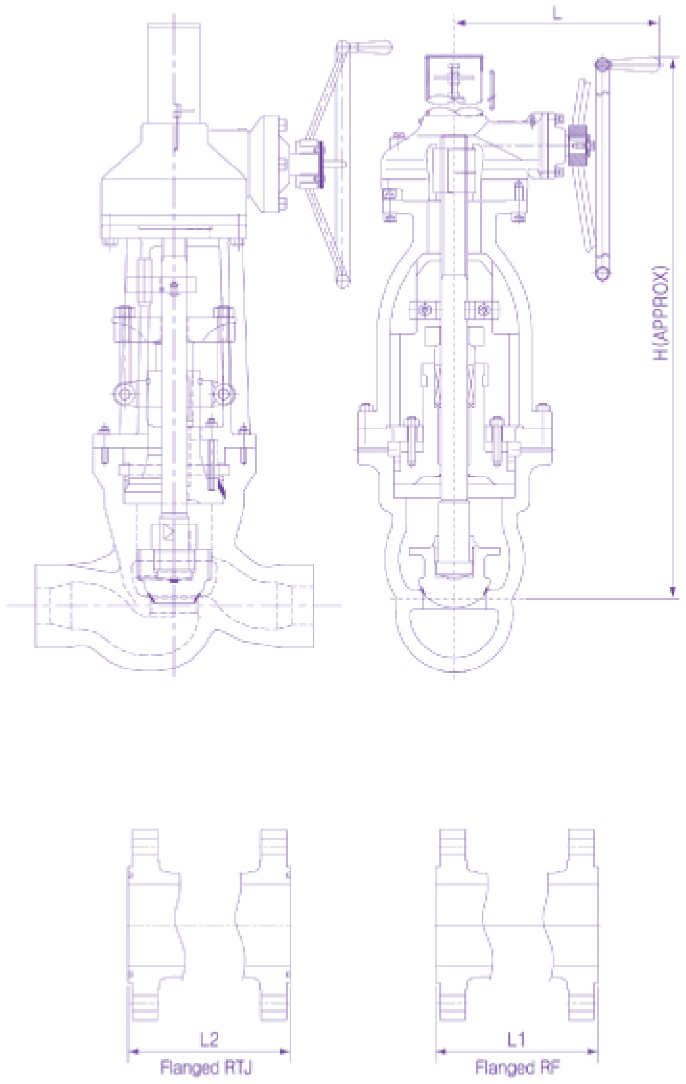

L1
Flanged RF



ASME CLASS 900LB

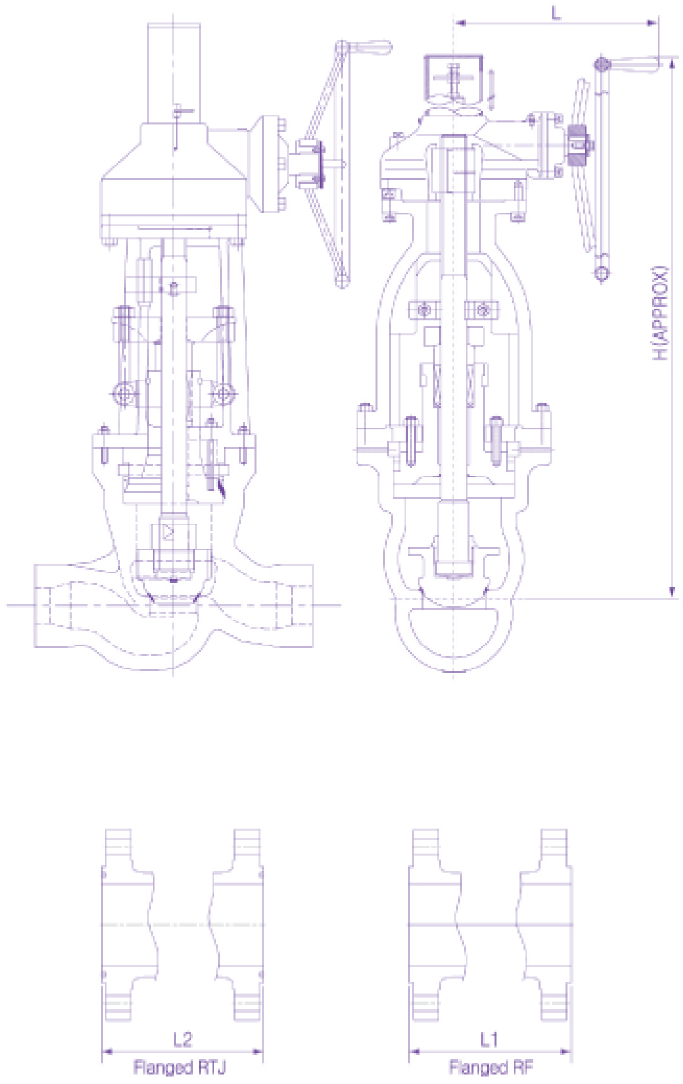
VALVE SIZE											
	inch	2	2½	3	4	6	8	10	12	14	16
	mm	50	65	80	100	150	200	250	300	350	400
L3	inch	8.5	10.0	12.0	14.0	20.0	26.0	31.0	36.0	39.0	43.0
	mm	216	254	305	356	508	660	787	914	991	1092
L2	inch	14.62	16.62	15.12	18.12	24.12	29.12	33.12	38.12	40.88	44.88
	mm	371	422	384	460	613	740	841	968	1038	1140
L1	inch	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
H	inch	24.4	25.3	28.4	33.5	48.2	53.1	61.0	58.9	78.7	90.9
	mm	619	641	721	850	1225	1350	1550	1750	2000	2310
W	inch	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	inch	-	-	-	-	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

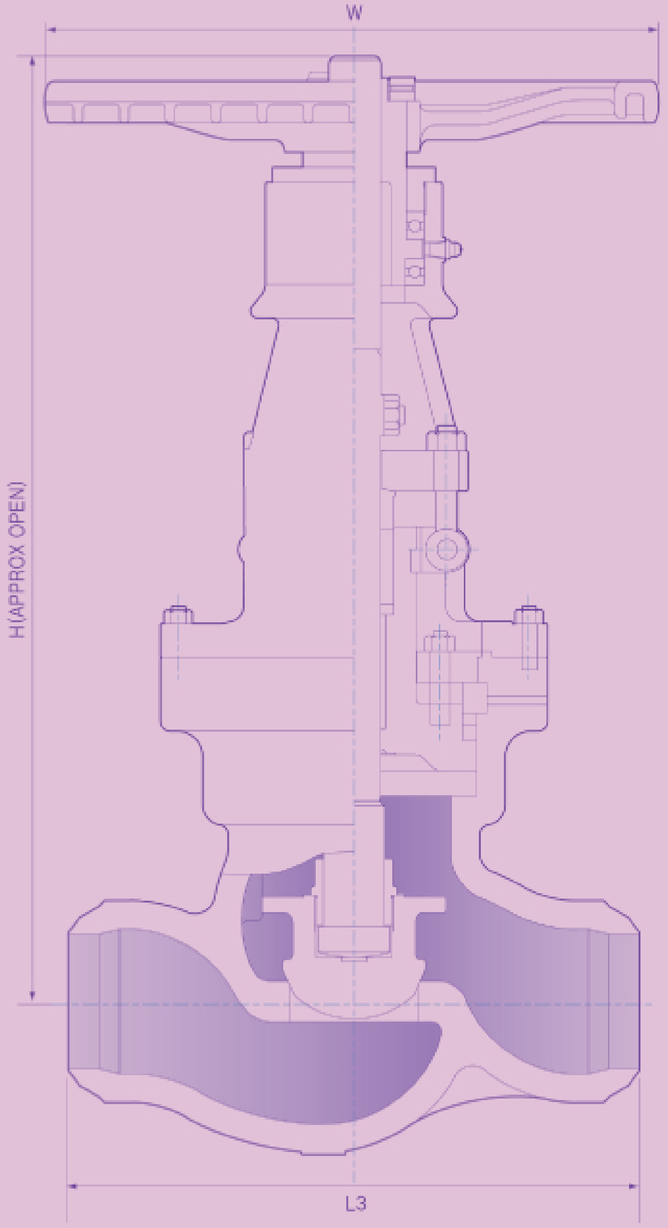




ASME CLASS 1500LB

VALVE SIZE										
	inch	2	2½	3	4	6	8	10	12	14
	mm	50	65	80	100	150	200	250	300	3500
L3	inch	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	inch	14.92	16.62	18.62	21.62	28.0	33.13	39.38	45.12	50.25
	mm	371	422	473	549	711	842	1000	1146	1276
L1	inch	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
H	inch	24.4	25.3	332.9	33.8	48.4	70.9	78.7	91.0	105.9
	mm	619	641	835	857	1230	1800	2000	2311	2691
W	inch	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	inch	-	-	-	-	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





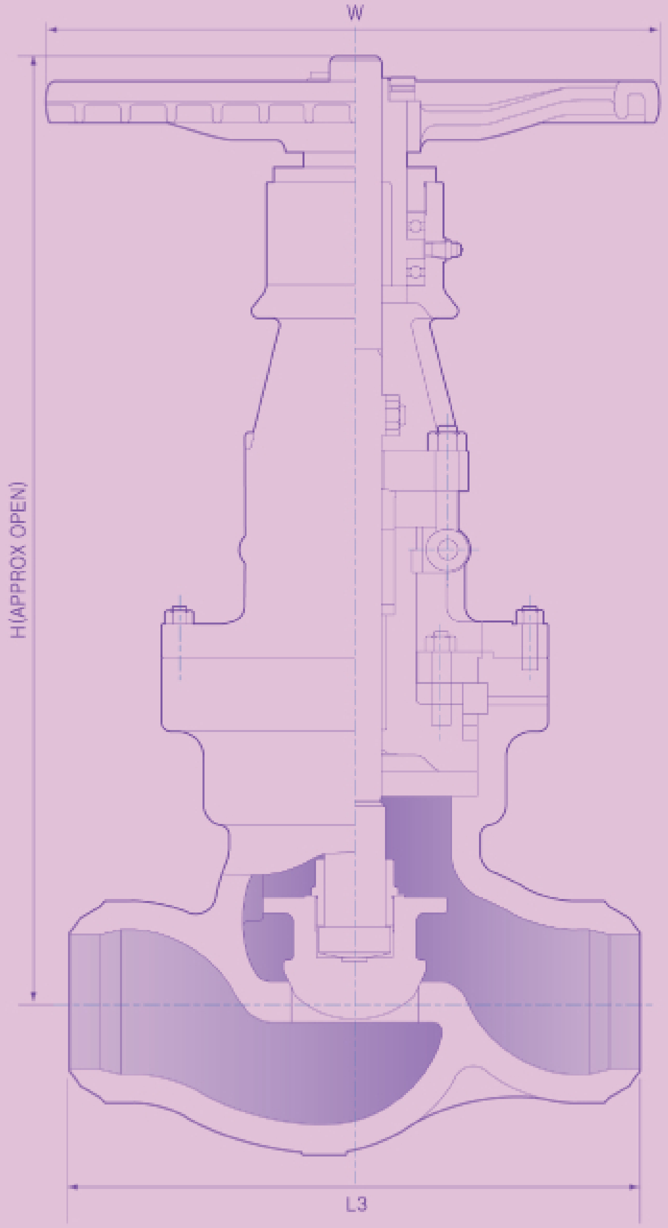
CAST STEEL

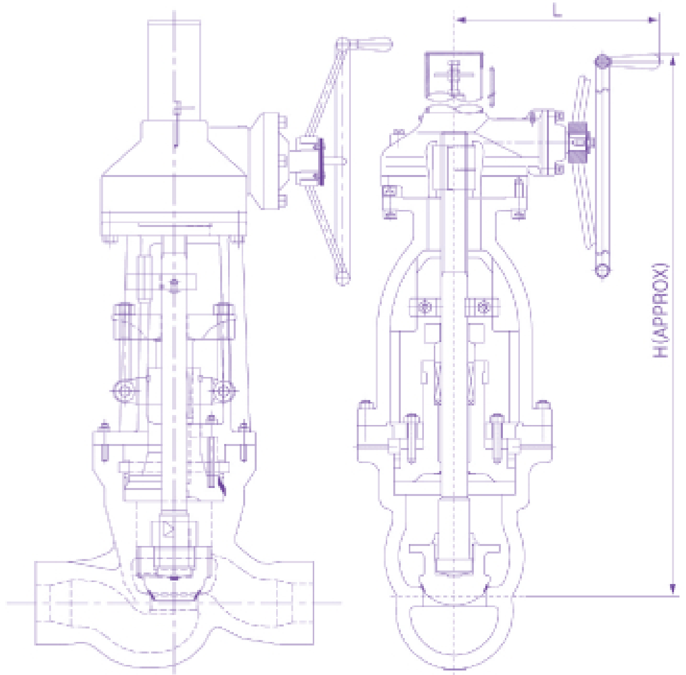
PRESSURE SEAL BONNET

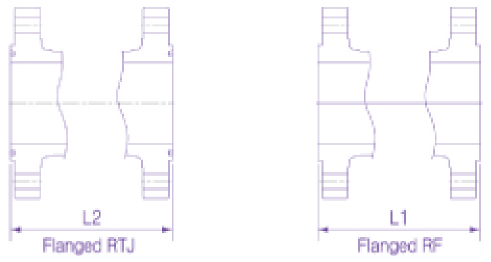
GLOBE VALVES

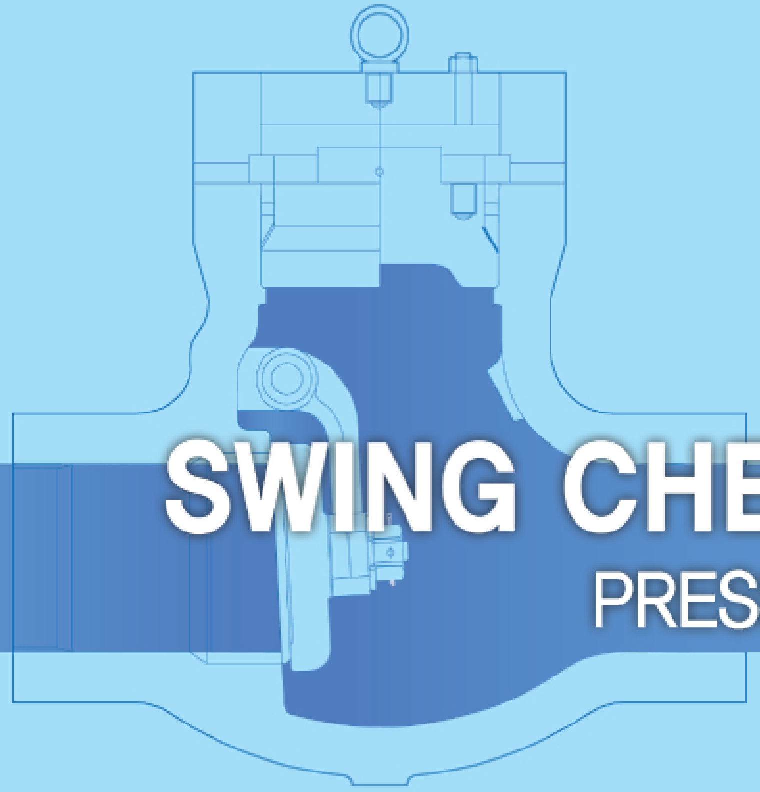
ASME CLASS 2500LB

VALVE SIZE	inch	2	2½	3	4	6	8	10	12
	mm	50	65	80	100	150	200	250	300
L3	inch	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
L2	inch	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
L1	inch	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
H	inch	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	inch	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	inch	-	-	-	20.2	174.0	22.3	22.3	22.3
	mm	-	-	-	512	432	567	567	567
WEIGHT	LB	220.5	341.8	463.1	1102.5	2756.3	5292.0	8186.5	9261.0
	Kg	100	155	210	500	1250	2400	3300	4200





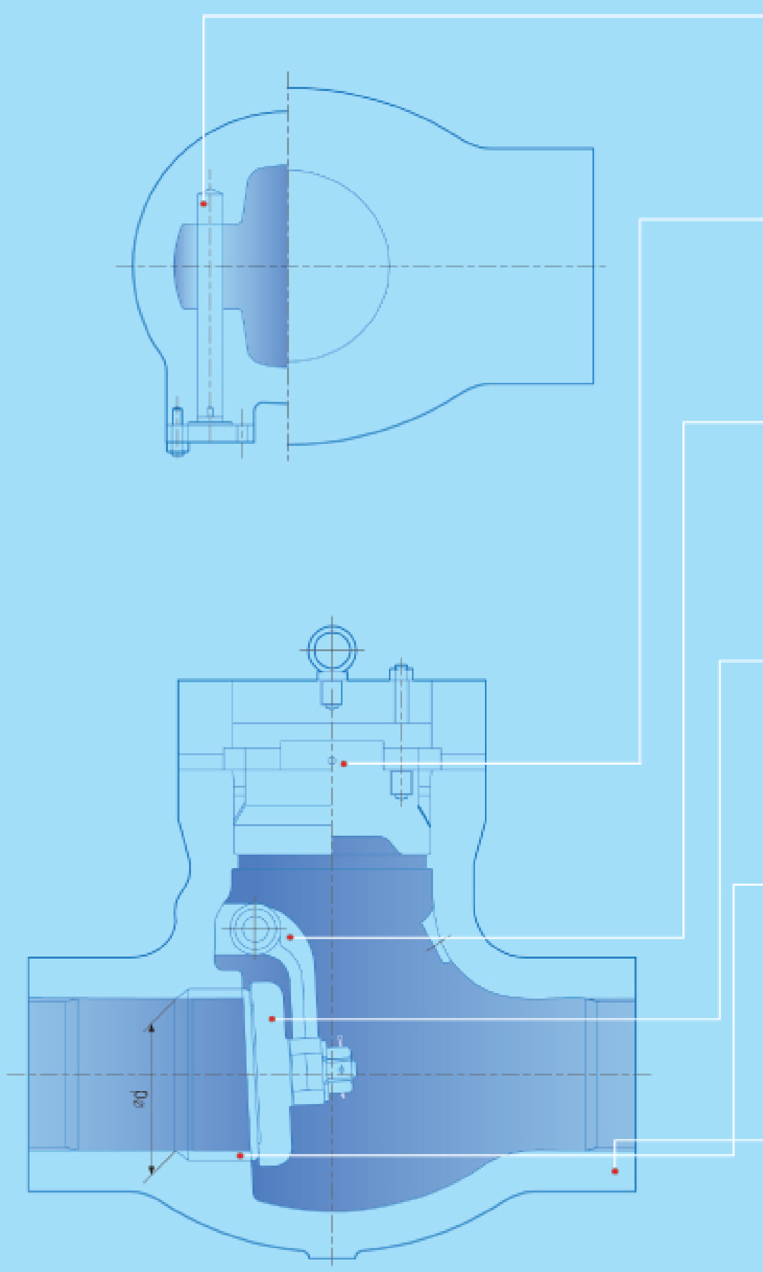




SWING CHECK VALVES

PRESSURE SEAL COVER

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.

ARM

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

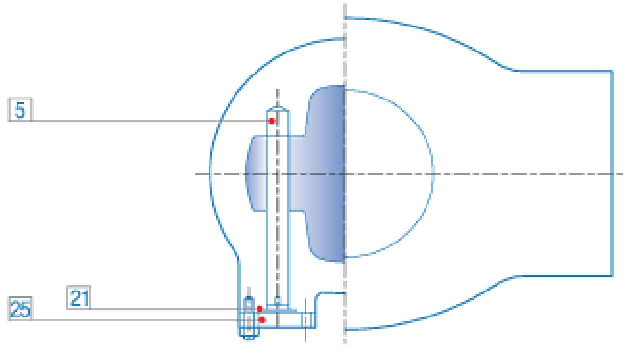
The Stellite 6 surface of the seat ring is integrally applied to the body by means of welding in all valve sizes.
Perfect mating with the DISC surfaces attained by a lapping finish applied to the seating.

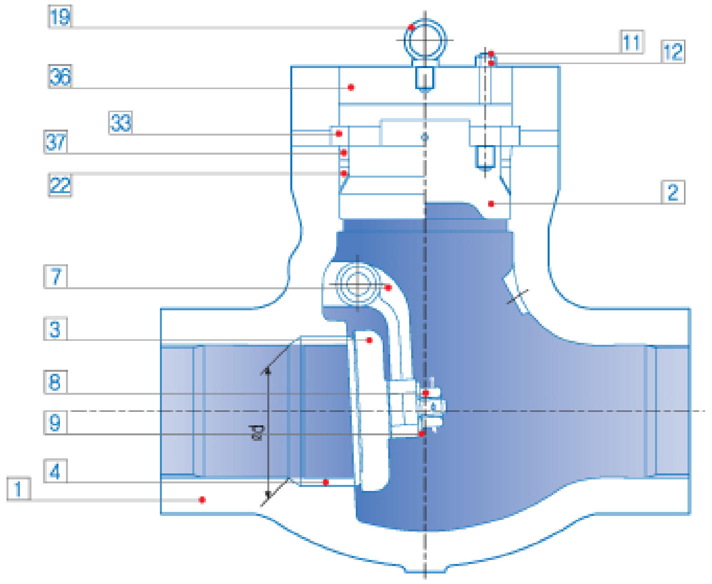
BODY

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 attained by accurate machining and honing finish.

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	A216-WCB+HF	A217-WC1+HF	A217-WC6+HF	A217-WC9+HF	A217-C5	A352-LCB	A352-LC1/LC2/LC3
4	BODY SEAT RING	C/S1020+HF	A182-F1	A182-F11	A182-F22	A182-F5a	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	A217-WC6	A217-WC9	A216-C5	A352-LCB	A352-LC1/LC2/LC3
11	BONNET BOLT	A193-B7	A193-B7	A193-B16	A193-B16	A193-B16	A320-L7	A320-L7
12	BONNET NUT	A194-2H	A194-2H	A194-4	A194-4	A194-4	A194-4	A194-4
25	PLUG	A276-410	A276-410	A276-410	A276-410	A276-410	A276-410	A276-410
33	RETAINER	A276-410	A276-410	A276-410	A276-410	A276-410	A276-304	A276-304
36	BONNER CLAMP	C/S1045	C/S1045	C/S1045	C/S1045	C/S1045	C/S1045	C/S1045
37	GASKET SPACER	A240-304	A240-304	A240-304	A240-304	A240-304	A240-304	A240-304

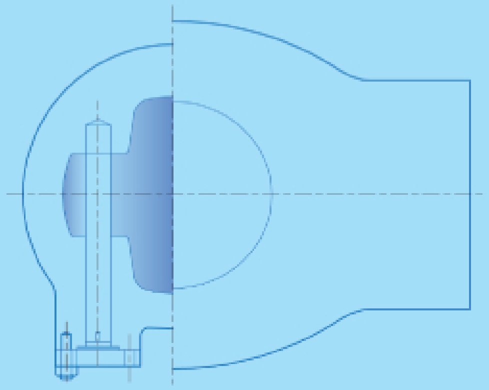
NO	NAME OF PART	ASTM SPECIFICATION
8	**DISC NUT**	A194-8
9	**WASHER**	A240-304
19	**EYE BOLT**	A307-B
21	**PLUG GASKET**	SEE PAGE 63
22	**GASKET**	SEE PAGE 63

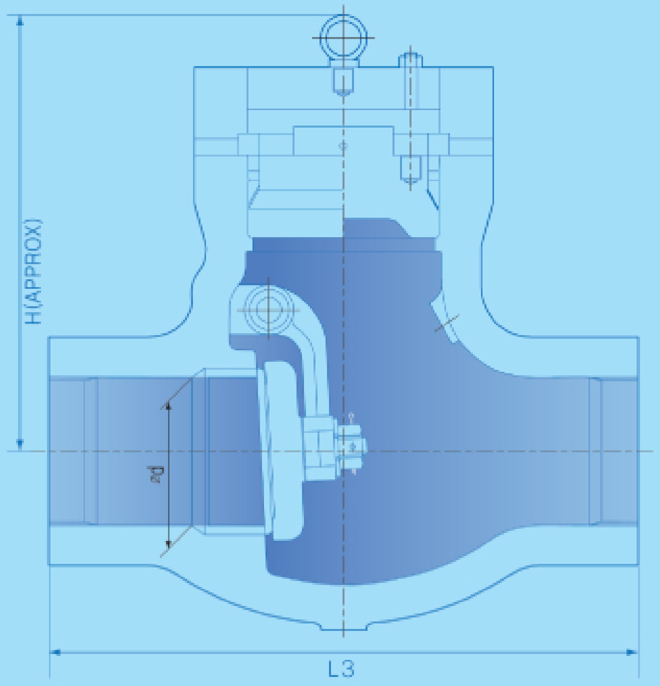


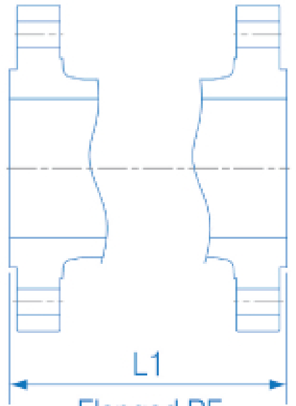


ASME CLASS 600LB

VALVE SIZE	inch	2	2½	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
L3	inch	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	inch	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
L1	inch	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
H	inch	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







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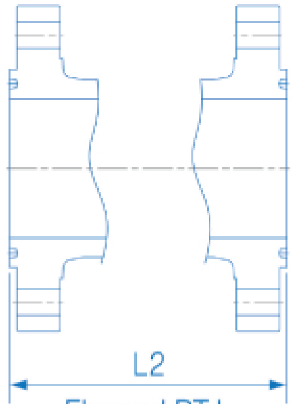

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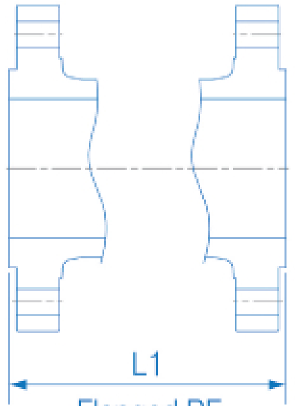
ASME CLASS 900LB

VALVE SIZE	inch	2	2½	3	4	6	8	10	12	14	16
	mm	50	65	80	100	150	200	250	300	350	400
L3	inch	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	inch	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
L1	inch	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
H	inch	9.5	1.4	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



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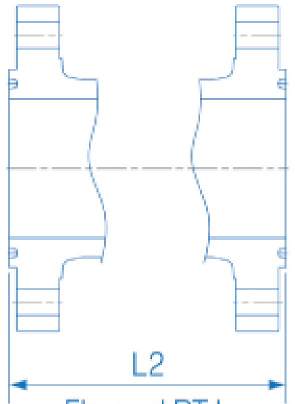

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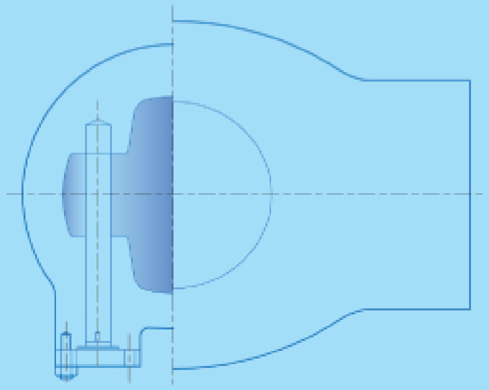
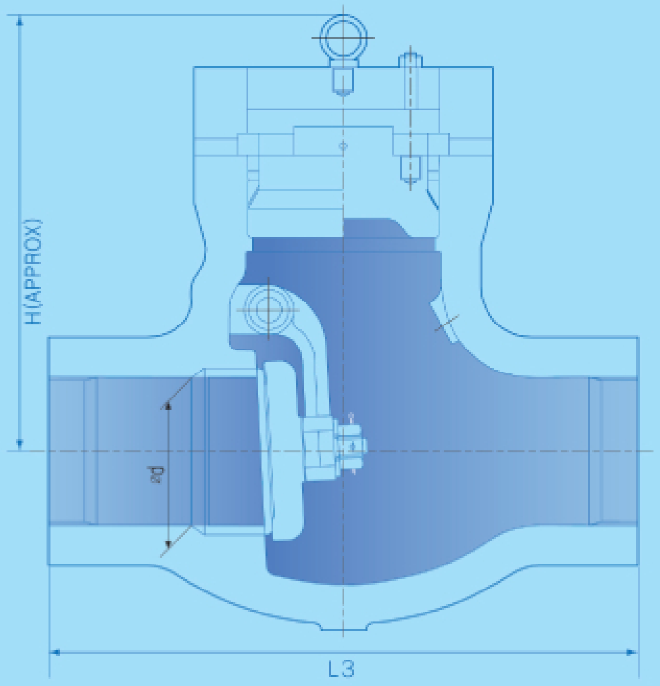
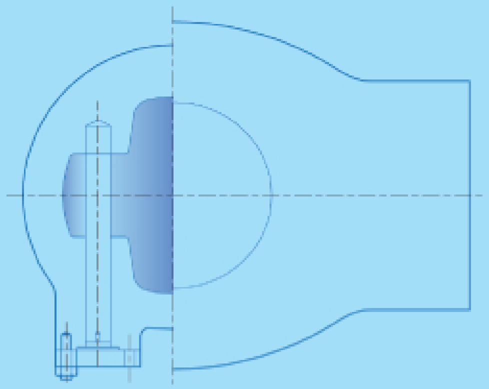
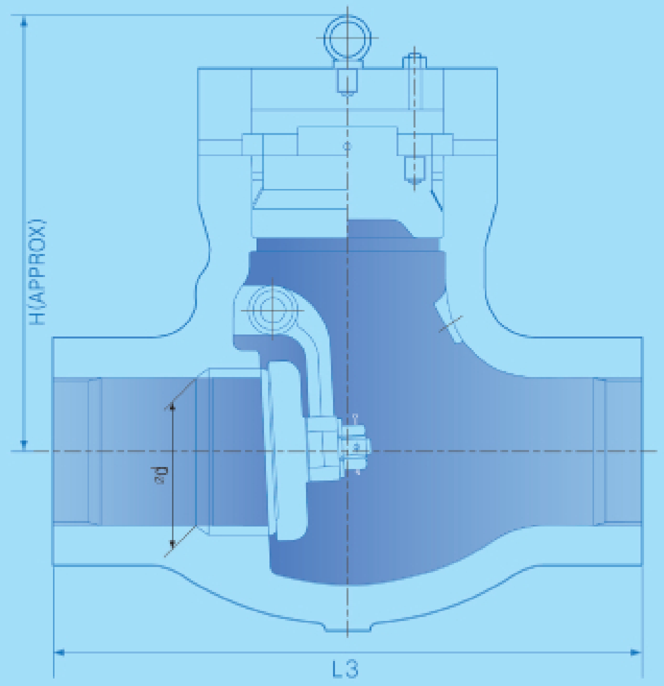


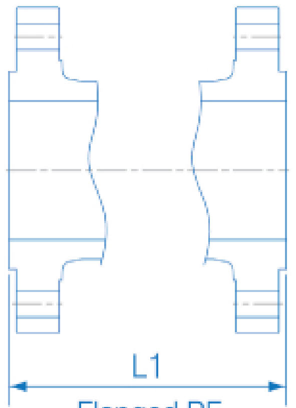


ASME CLASS 1500LB

VALVE SIZE	inch	2	2½	3	4	6	8	10	12	14
	mm	50	65	80	100	150	200	250	300	350
L3	inch	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	inch	14.62	16.62	18.62	21.62	28.0	33.13	39.38	45.12	50.25
	mm	371	422	473	549	711	842	1000	1146	49.5
L1	inch	14.5	16.5	18.5	21.5	27.75	32.75	39.0	44.5	1257
	mm	368	419	470	546	705	832	991	1130	1276
H	inch	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







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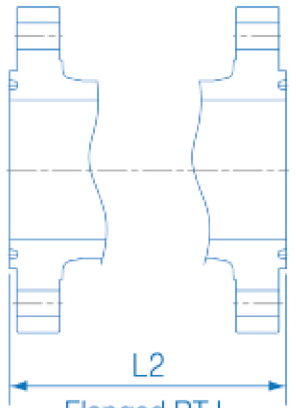

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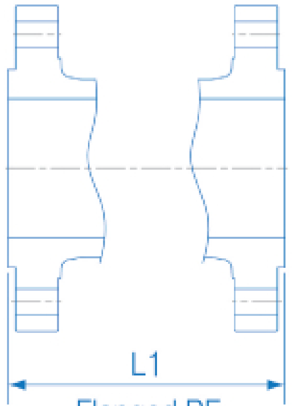
ASME CLASS 2500LB

VALVE SIZE	inch	2	2½	3	4	6	8	10	12	14	16	18
	mm	50	65	80	100	150	200	250	300	350	400	450
L3	inch	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
L2	inch	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	-	-	-
L1	inch	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	-
H	inch	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	LB	187.4	260.2	341.8	628.4	1653.8	2976.8	4740.8	6615.0	9216.9	11157.3	16493.4
	Kg	85	118	155	285	750	1350	2150	3000	4180	5060	7480



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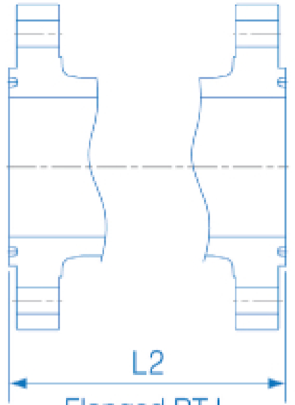

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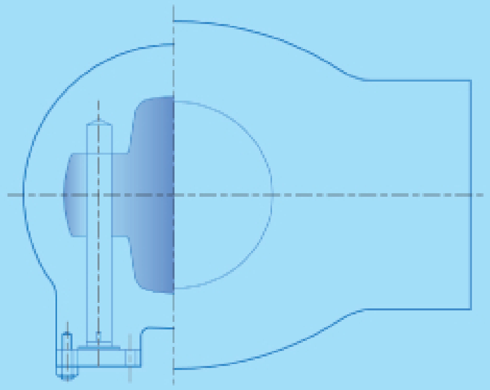
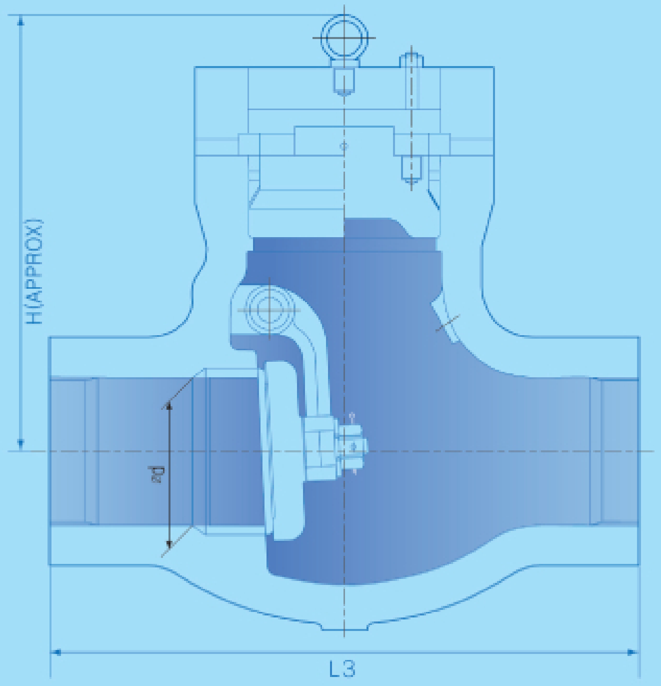
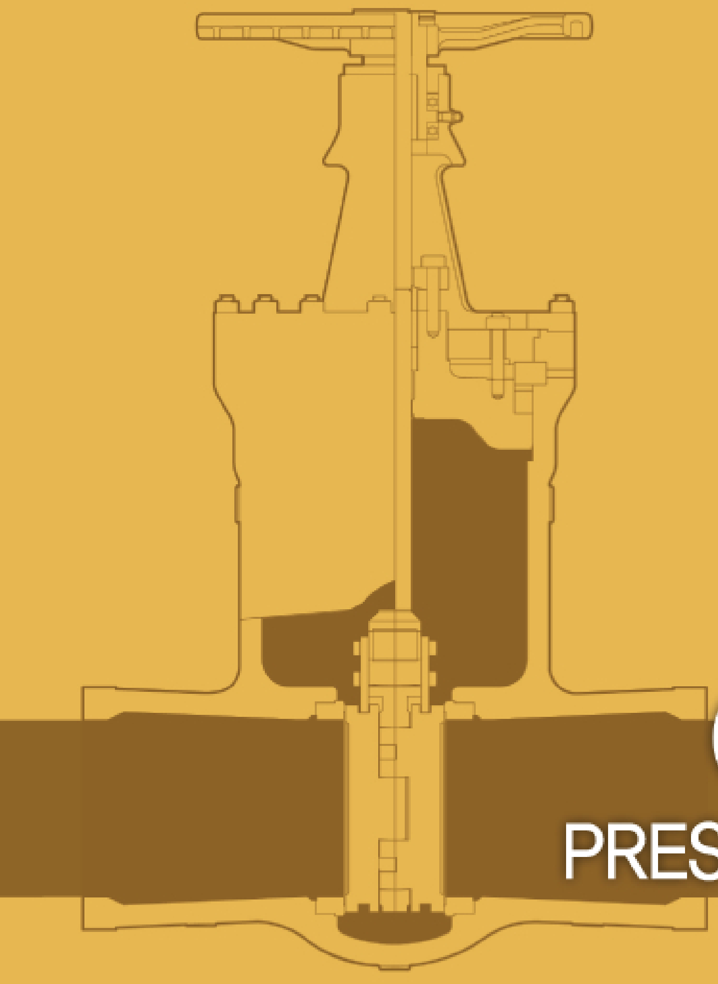
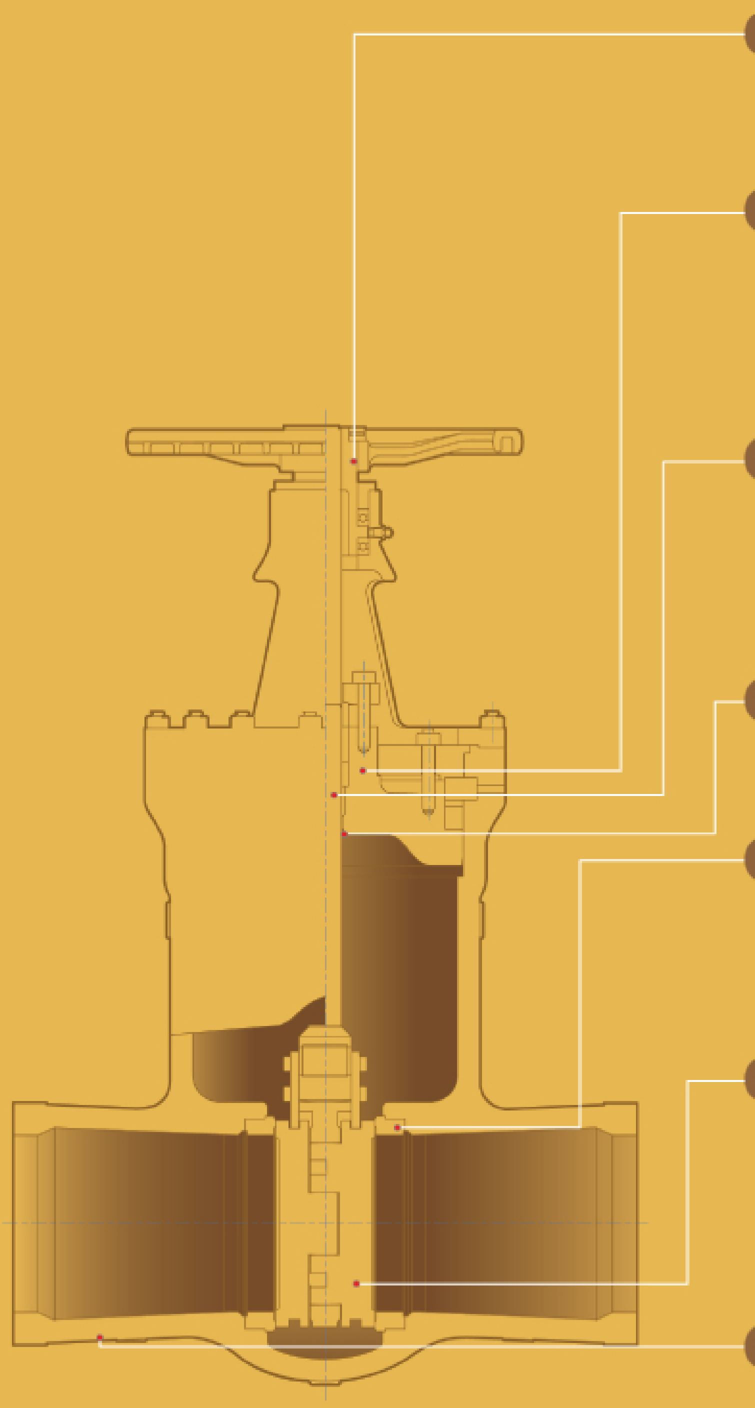






GATE VALVES
PRESSURE SEAL PARALLEL

CAST STEEL
GATE VALVES PRESSURE SEAL PARALLEL



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.

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 with the wedge surfaces.

PARALLEL DISC

The parallel disc 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

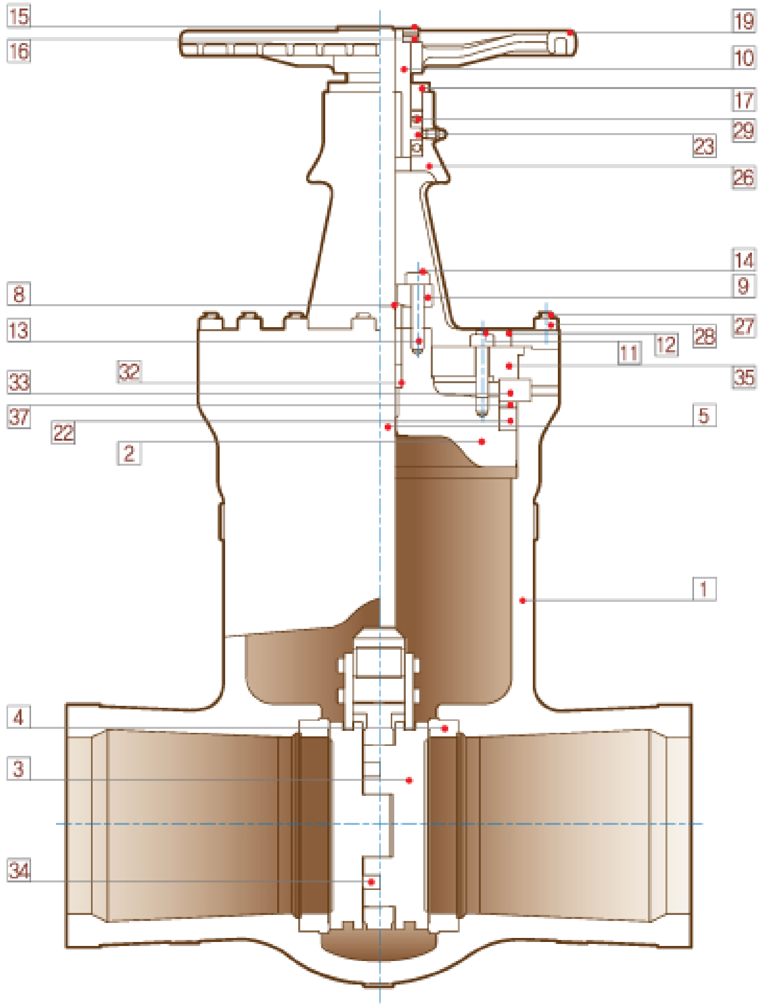
The valve body is cylindrically shaped to prevent distortion or undue stress during extreme working conditions. Inaddition, adequate padding helps to achieve a sound cast structure in critical area. The wall thickness is greater than, or in accordance with API, ANSI and ASME requirements. The contact surfaces ensure that a minimum specific pressure is achieved. The close tolerances of the inside diameter of this area are attained by accurate machining and honing finish.

GATE VALVES PRESSURE SEAL BONNET

CAST STEEL

NO	NAME OF PART	ASTM SPECIFICATION										
		STANDARD	HIGH TEMPERATURE SERVICE						STAINLESS STEEL			
1	BODY	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A217-C12	A217-C12A	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
2	BONNET	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A217-C12	A217-C12A	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
3	DISC	A216-WCB	A217-WC1	A217-WC6	A217-WC9	A217-C5	A217-C12	A217-C12A	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
4	BODY SEAT RING	A105+STL	A182-F1	A182-F11	A182-F22	A182-F5a	A182-F9	A182-F91	A240-304	A240-316	A240-304L	A240-316L
5	STEM	A479-410							A276-304	A276-316	A276-304L	A276-316L
8	PACKING GLAND	A479-410							A276-304			
9	GLAND FLANGE	A105 or A283-D							AISI 304			
10	YOKE SLEEVE	A439-D2							A439-D2			
11	BONNET BOLT	A193-B7	A193-B16						A193-B8			
12	BONNET NUT	A194-2H	A194-4						A194-8			
13	GLAND BOLT	A193-B7							A193-B8			
14	GLAND NUT	A194-2H							A194-8			
26	YOKE	A216--WCB							A351-CF8			
27	YOKE BOLT	A193-B7							A193-B8			
28	YOKE NUT	A194-2H							A194-8			
32	PACKING RING	A479-410							A276-304	A276-316	A276-304L	A276-316L
33	RETAINER	A29-1045-Cr.PLATED	A240-304						A240-304L			
34	SPRING	INCONEL							INCONEL			
35	BONNET CLAMP	A29-1045							A240-304			
37	GASKET SPACER	A29-1045-Cr.PLATED	A240-304						A240-304			

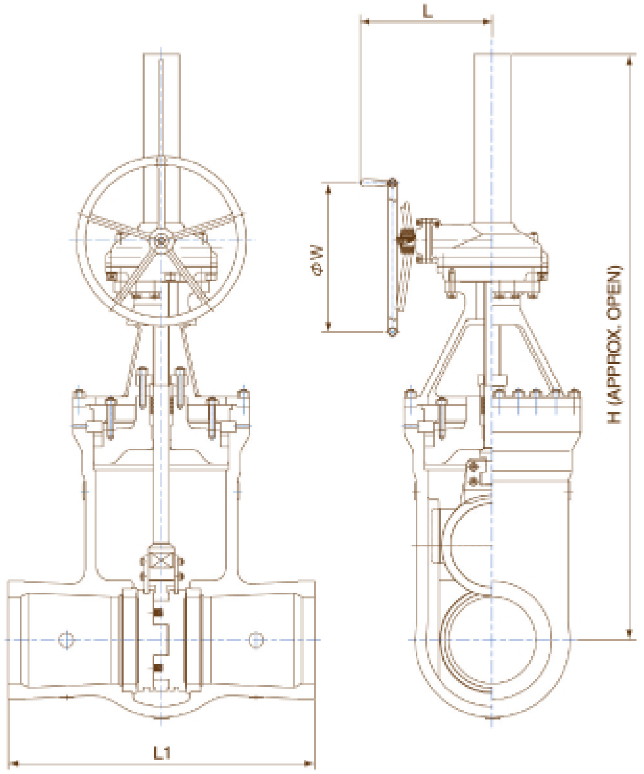
NO	NAME OF PART	ASTM SPECIFICATION
15	**HANDLE NUT**	STEEL
16	**SET SCREW**	STEEL
17	**SLEEVE GLAND**	STEEL
19	**HANDWHEEL**	A395
21	**PACKING**	COMMERCIAL
22	**GASKET**	COMMERCIAL
23	**GREASE NIPPLE**	STEEL
29	**BEARING**	COMMERCIAL

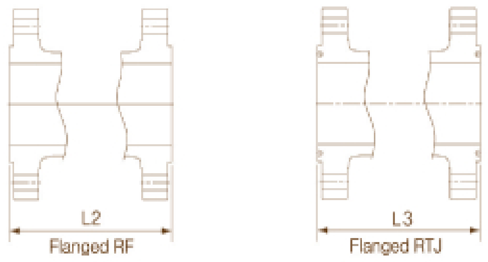


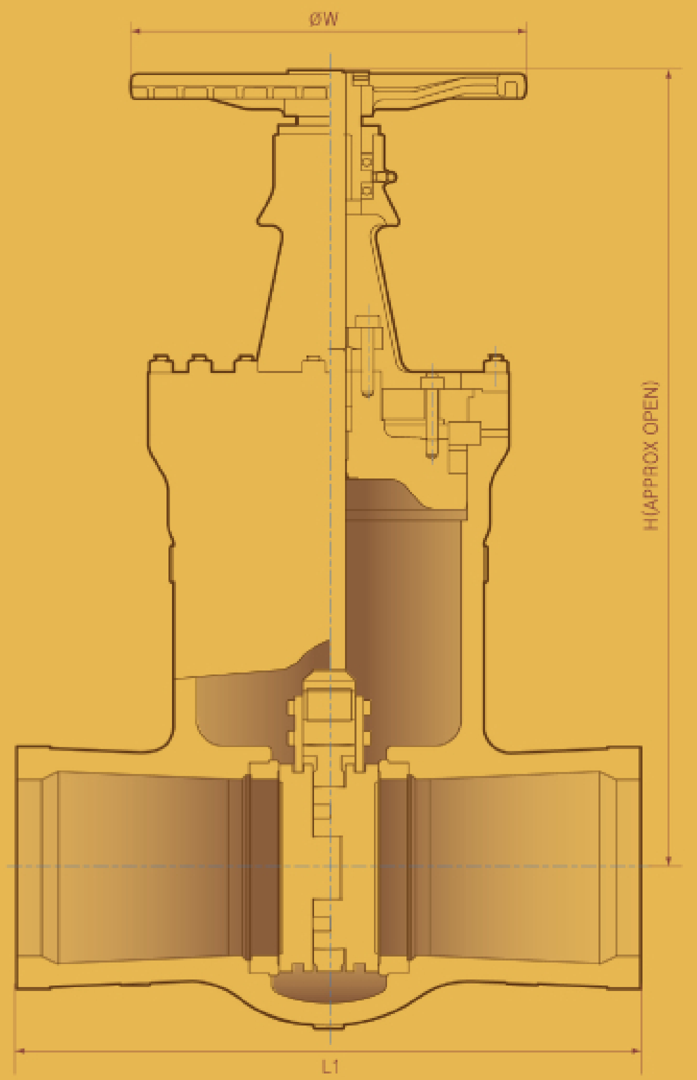
PGT CLASS 600LB

GATE VALVES
PRESSURE SEAL BONNET
PARALLEL GATE VALVES

VALVE SIZE		inch	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		inch	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		inch	11.5	13.0	14.0	17.0	21.9	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
L3		inch	11.6	13.1	14.1	17.1	22.1	26.1	31.1	33.1	35.1	39.1	43.1	47.2	55.4
		mm	295	333	359	435	562	664	791	841	892	994	1095	1200	1406
H		inch	19.1	20.3	22.8	27.1	37.6	44.7	50.2	57.3	66.9	84.1	104.3	110.0	122.2
		mm	485	515	578	689	955	1135	1275	1455	1698	2135	2650	2795	3105
W		inch	8.8	8.8	9.8	11.8	17.7	19.7	24.8	15.7	19.7	24.8	28.0	28.0	31.5
		mm	224	224	250	300	450	500	630	400	500	630	710	710	800
L		inch	-	-	-	-	-	-	-	13.0	13.5	15.3	16.0	16.0	18.1
		mm	-	-	-	-	-	-	-	330	342	389	406	406	461
WEIGHT	RF	inch	99.2	123.5	134.5	216.1	571.0	881.8	1338.2	1944.5	2381.0	3626.6	5070.6	6757.2	8873.6
		mm	45	56	61	98	259	400	607	882	1080	1645	2300	3065	4025
	BW	LB	81.6	90.4	99.2	143.3	407.9	650.4	981.1	1510.2	1862.9	2888.1	4122.6	5533.6	7120.9
		Kg	37	41	45	65	185	295	445	685	845	1310	1870	2510	3230

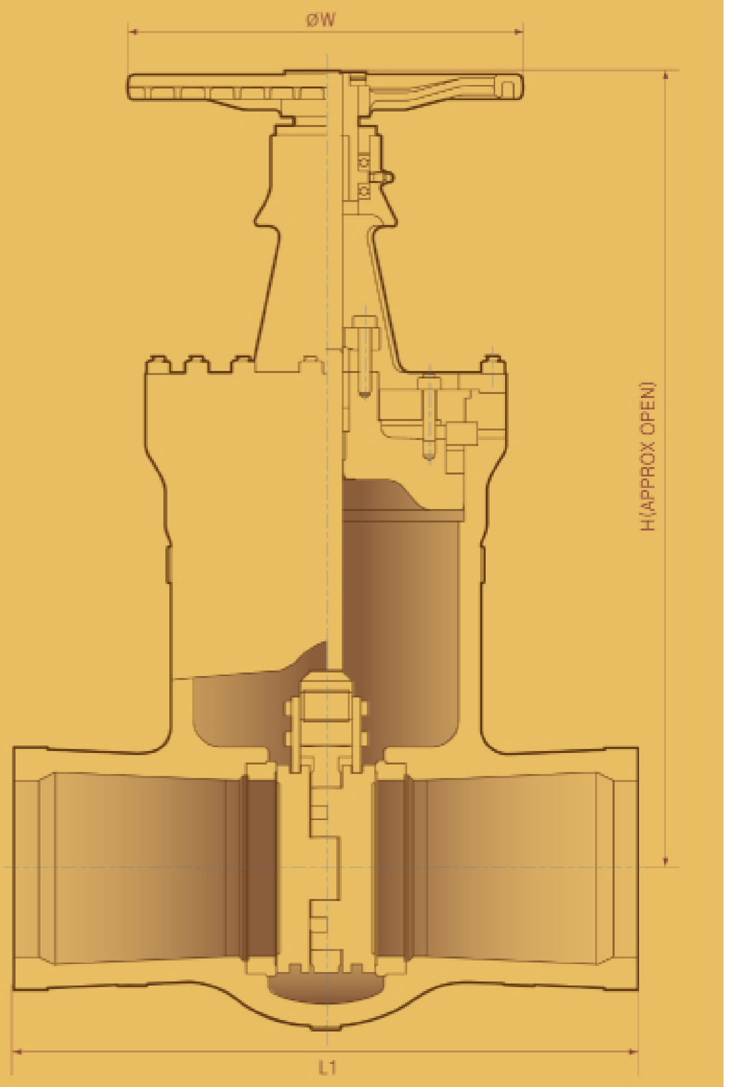


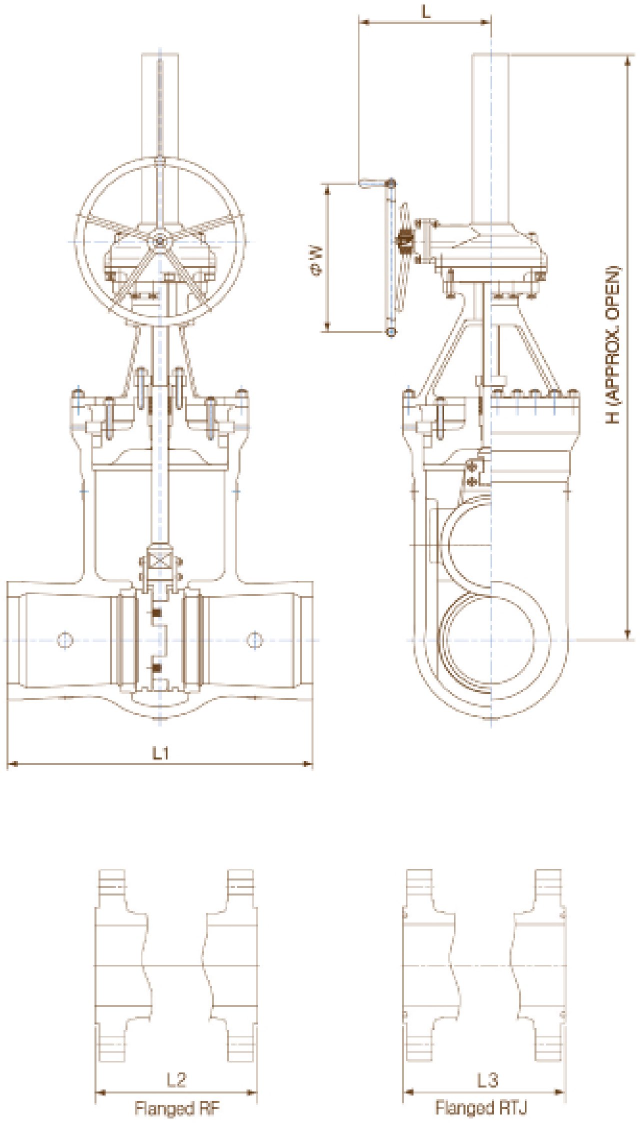




PGT CLASS 900LB

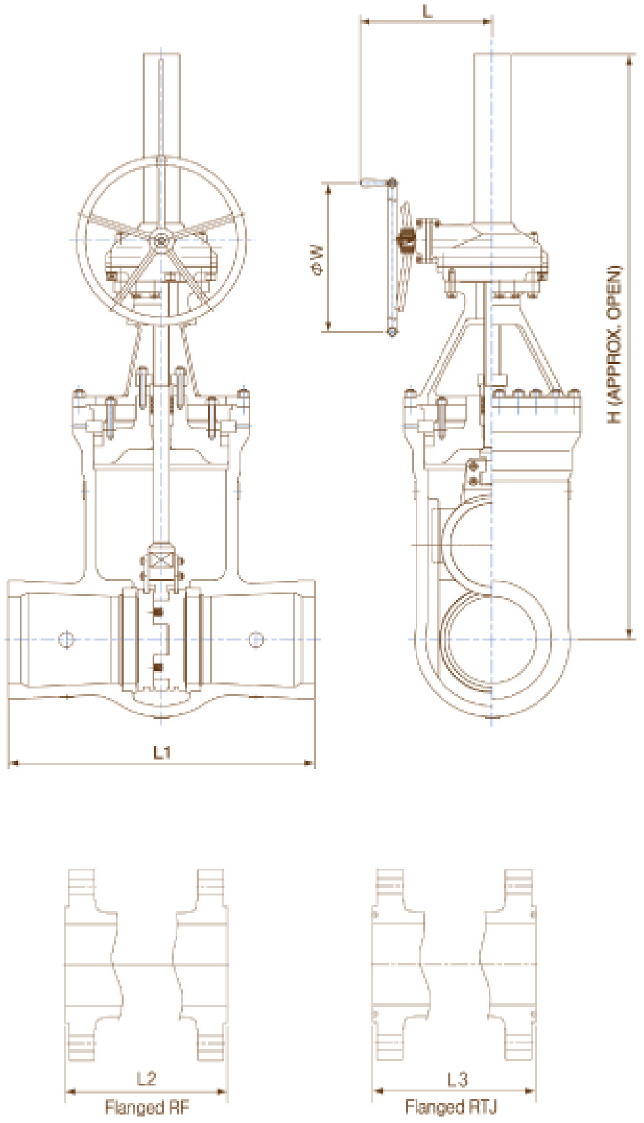
VALVE SIZE		inch	2	2.5	2.5	4	6	8	10	12	14	16	18	20	24
		mm	50	65	65	100	150	200	250	300	350	400	450	500	600
L1		inch	8.5	10.0	10.0	14.0	20.0	26.0	31.0	32.0	39.0	43.0	46.5	50.5	59.5
		mm	216	254	254	356	508	660	787	814	991	1092	1181	1283	1511
L2		inch	14.5	16.5	16.5	18.0	24.0	29.0	33.0	38.0	40.5	44.5	48.0	52.0	61.0
		mm	368	419	419	457	610	737	838	965	1029	1130	1219	1321	1549
L3		inch	14.6	16.6	16.6	18.1	24.1	29.1	33.1	38.1	40.9	44.9	48.5	52.5	61.7
		mm	371	422	422	460	612	740	841	968	1038	1140	1232	1333	1568
H		inch	21.3	24.4	24.4	31.1	42.7	49.2	55.9	65.6	72.8	80.9	85.2	89.8	111.4
		mm	540	620	620	789	1085	1250	1420	1666	1850	2056	2165	2280	2830
W		inch	11.8	11.8	11.8	15.7	22.0	19.7	24.8	28.0	28.0	31.5	31.5	35.4	35.4
		mm	300	300	300	400	560	500	630	710	710	800	800	900	900
L		inch	-	-	-	-	-	13.5	15.3	16.0	16.0	18.1	18.1	19.1	19.1
		mm	-	-	-	-	-	342	389	406	406	461	461	486	486
WEIGHT	RF	inch	141.1	160.9	160.9	280.0	937.0	1221.4	2030.5	2821.9	3216.5	5147.8	6655.8	9050	12930
		mm	64	73	73	127	425	554	921	1280	1459	2335	3019	4105	5865
	BW	LB	94.8	105.8	105.8	189.6	749.6	903.9	1576.3	2193.6	2491.2	4259.3	5401.3	7495.7	9920.8
		Kg	43	48	48	86	340	410	715	995	1130	1932	2450	3400	4500

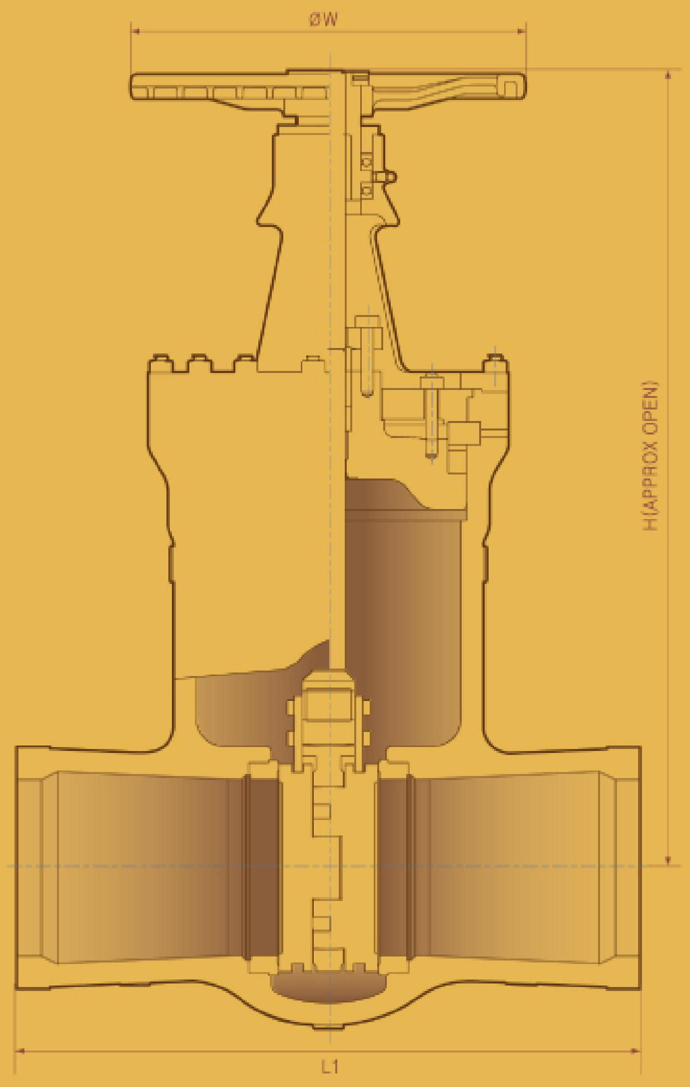




PGT CLASS 1500LB

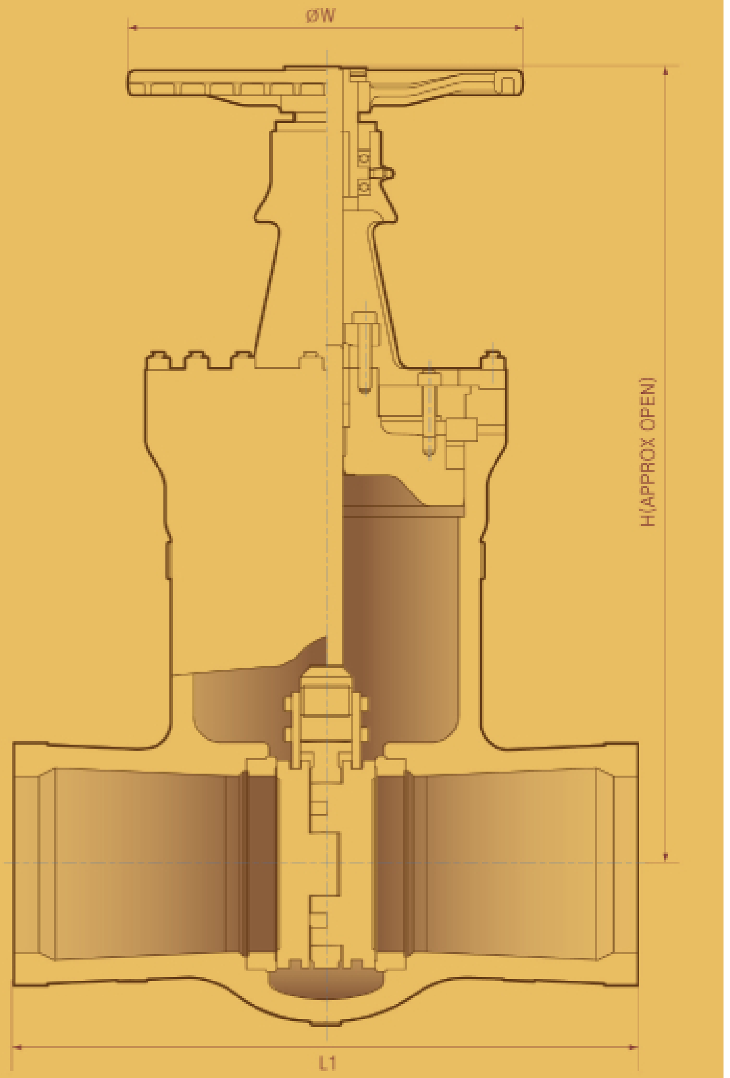
VALVE SIZE		inch	2	2.5	3	4	6	8	10	12	14	16	18	20	24
		mm	50	65	80	100	150	200	250	300	350	400	450	500	600
L1		inch	8.5	10.0	12.0	16.0	22.0	28.0	34.0	39.0	42.0	47.0	53.0	58.0	64.0
		mm	216	254	305	406	559	711	864	991	1067	1194	1346	1473	1626
L2		inch	14.5	16.5	18.5	21.5	27.8	32.8	39.0	44.5	49.5	54.5	60.5	65.5	76.5
		mm	368	419	470	546	705	832	991	1130	1257	1384	1536	1664	1943
L3		inch	14.6	16.6	18.6	21.6	28.0	33.1	39.4	45.1	50.2	55.4	61.4	66.4	77.6
		mm	371	422	473	549	711	841	1000	1146	1276	1406	1559	1686	1972
H		inch	21.3	24.4	27.4	33.1	47.0	52.8	57.1	61.8	66.3	74.4	82.3	103.5	117.3
		mm	540	620	695	840	1195	1340	1450	1570	1683	1890	2090	2630	2980
W		inch	11.8	11.8	15.7	19.7	19.7	24.8	28.0	31.5	31.5	35.4	35.4	39.4	39.4
		mm	300	300	400	500	500	630	710	800	800	900	900	1000	1000
L		inch	-	-	-	-	13.5	15.3	16.0	18.1	18.1	19.1	19.1	23.2	24.4
		mm	-	-	-	-	342	389	406	461	461	486	486	590	619
WEIGHT	RF	inch	141.1	160.9	284.4	456.4	983.3	1671.1	2885.9	3926.4	4872.2	7198.1	11001	15013	22575
		mm	64	73	129	207	446	758	1309	1781	2210	3265	4990	6810	10240
	BW	LB	94.8	105.8	198.4	326.3	674.6	1168.4	2028.3	2634.5	3130.6	4925.1	7936.6	11188	16424
		Kg	43	48	90	148	306	530	920	1195	1420	2234	3600	5075	7450

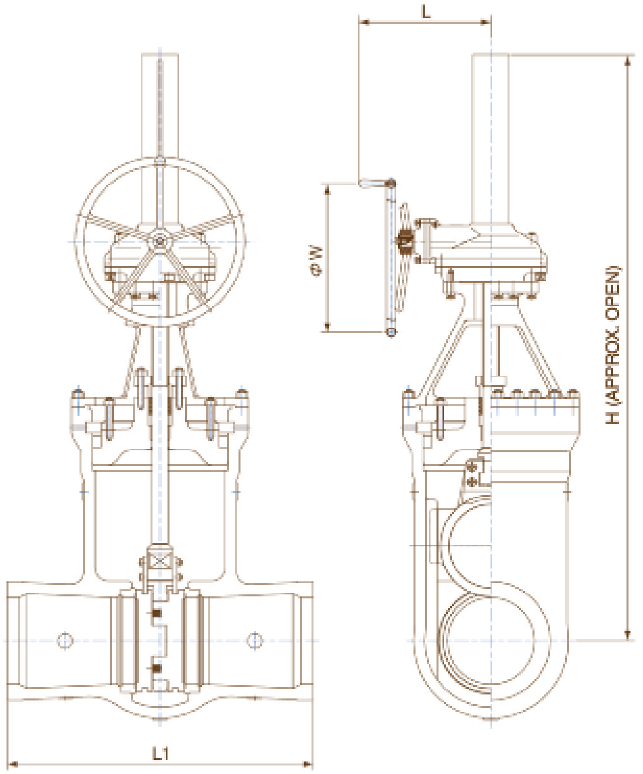


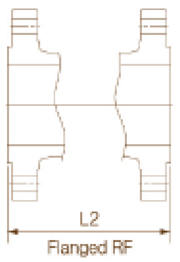


PGT CLASS 2500LB

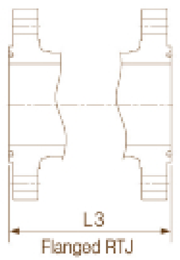
VALVE SIZE		inch	2	2.5	3	4	6	8	10	12	14	16	18	20	24
		mm	50	65	80	100	150	200	250	300	350	400	450	500	600
L1		inch	11.0	13.0	14.5	18.0	24.0	30.0	36.0	41.0	44.0	49.0	55.0	60.0	65.0
		mm	279	330	368	457	610	762	914	1041	1118	1245	1397	1524	1650
L2		inch	17.8	20.0	22.8	26.5	36.0	40.2	50.0	56.0	-	-	-	-	-
		mm	451	508	578	673	914	1022	1270	1422	-	-	-	-	-
L3		inch	17.9	20.2	23.0	26.9	36.5	40.9	50.9	56.9	-	-	-	-	-
		mm	454	514	584	683	927	1038	1292	1445	-	-	-	-	-
H		inch	22.6	28.1	29.3	32.1	45.3	53.0	58.1	63.8	67.7	76.2	84.4	104.1	109.6
		mm	575	715	745	815	1150	1345	1475	1620	1720	1935	2145	2645	2785
W		inch	11.8	15.7	19.7	19.7	24.8	28.0	31.5	31.5	35.4	35.4	39.4	39.4	39.4
		mm	300	400	500	500	630	710	800	800	900	900	1000	1000	1000
L		inch	-	-	-	13.5	15.3	16.0	18.1	18.1	19.1	19.1	23.2	24.4	24.4
		mm	-	-	-	342	389	406	461	461	486	486	590	619	619
WEIGHT	RF	inch	227.1	295.4	405.7	615.1	1580.7	2275.2	4144.7	6128.8	-	-	-	-	-
		mm	103	134	184	279	717	1032	1880	2780	-	-	-	-	-
	BW	LB	154.3	187.4	242.5	363.8	937.0	1311.8	2259.7	3494.3	4166.7	6338.3	8587.0	12754	17538
		Kg	70	85	110	165	425	595	1025	1585	1890	2875	3895	5785	7955



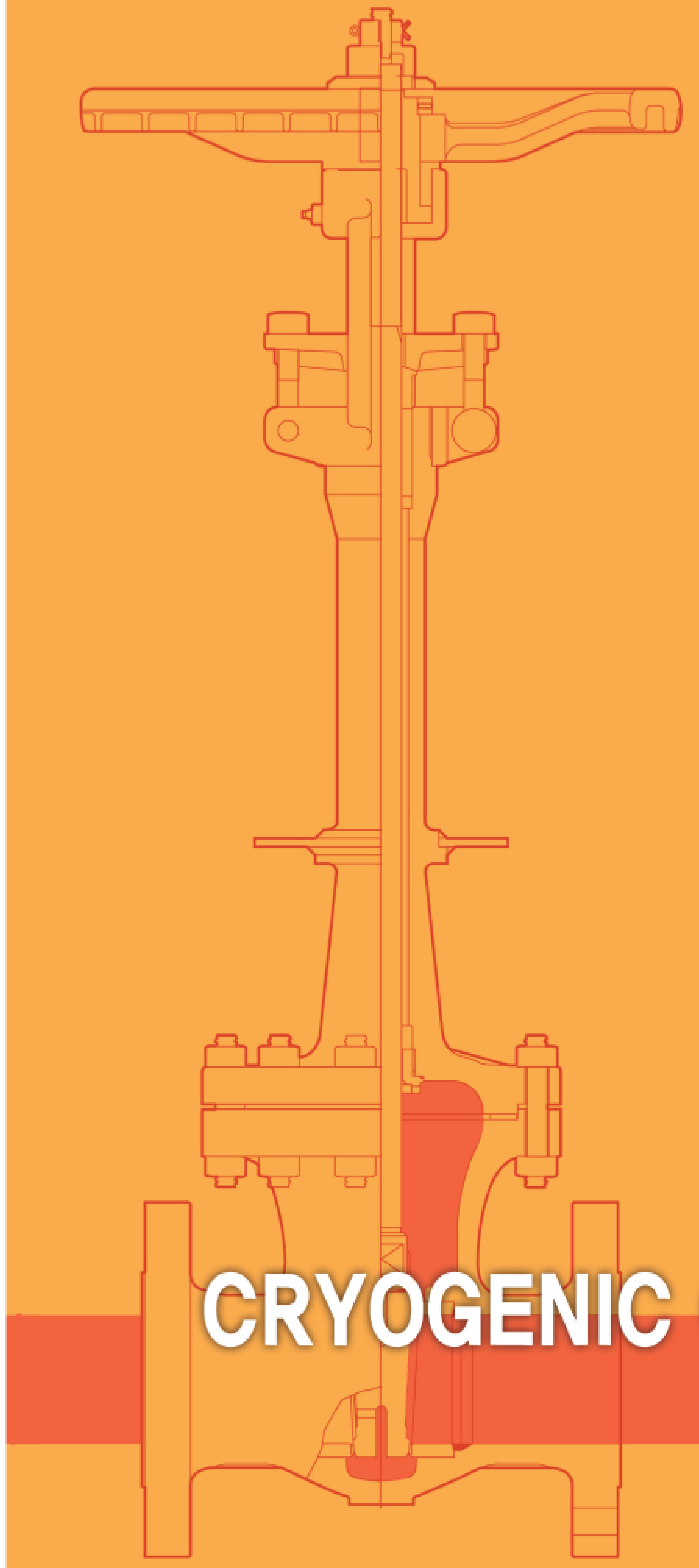




Flanged RF



Flanged RTJ

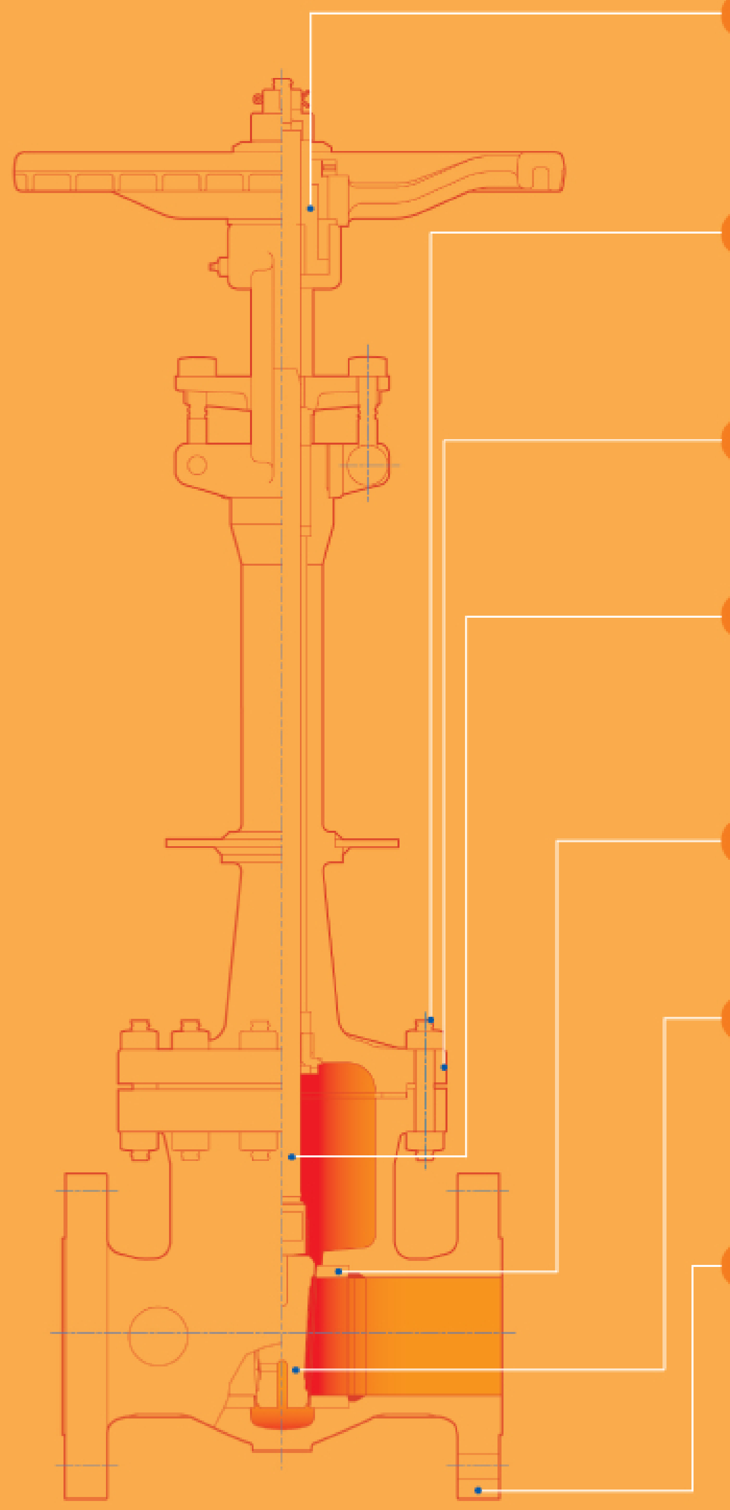


CRYOGENIC GATE VALVES

BOLTED BONNET

STAINLESS STEEL

CRYOGENIC 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 B 1.1 Strain-hardened austentic stainless steel.

BONNET

Austenitic stainless steel used for bodies and bonnets offer excellent impact strength, minimize heat loss and protect against corrosion.

STEM

The heat treated stem delivers adequate mechanical properties as well as excellent surface hardness. Further, opening/shutting friction is minimized by accurate machining and lapping.

SEAT RING

Stellite 6 for all medium and high pressure application prevents seizing and galling.

FLEXIBLE WEDGE

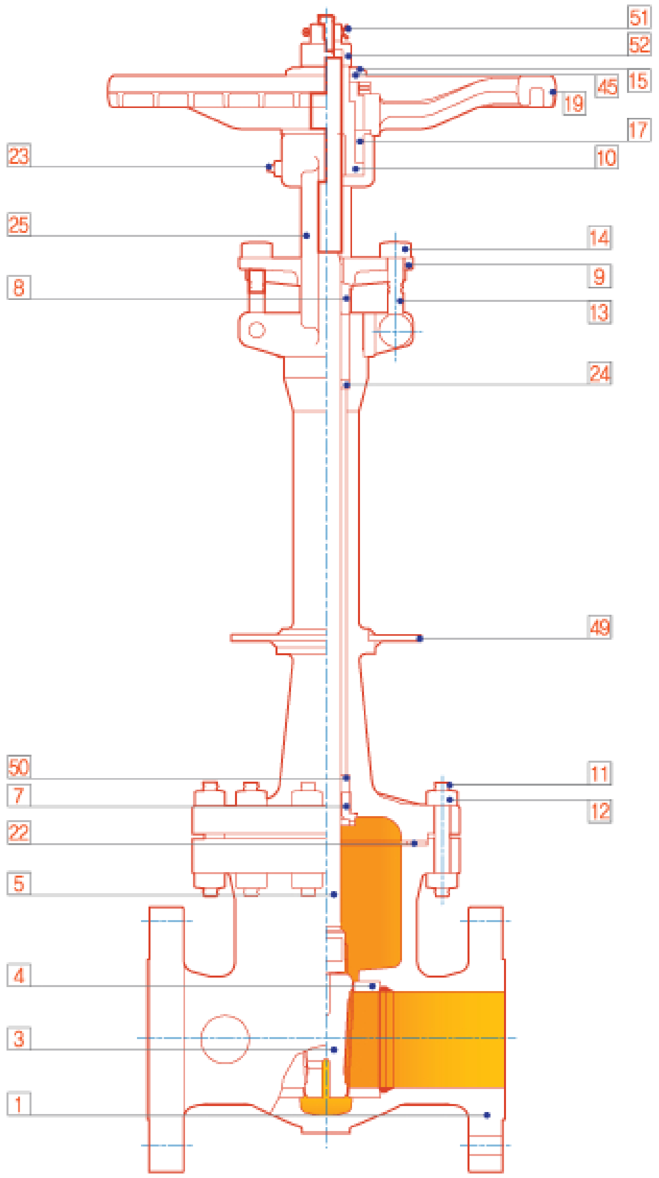
The wedge seating surfaces have been accurately machined, grind and lapped to a mirror finish to prevent leakage and eliminate galling. Stellite 6 for all medium and high pressure application prevents selzing and galling.

BODY

TAustenitic stainless steel used for bodies and bonnets offer excellent impact strength, minimize heat loss and protect against corrosion.

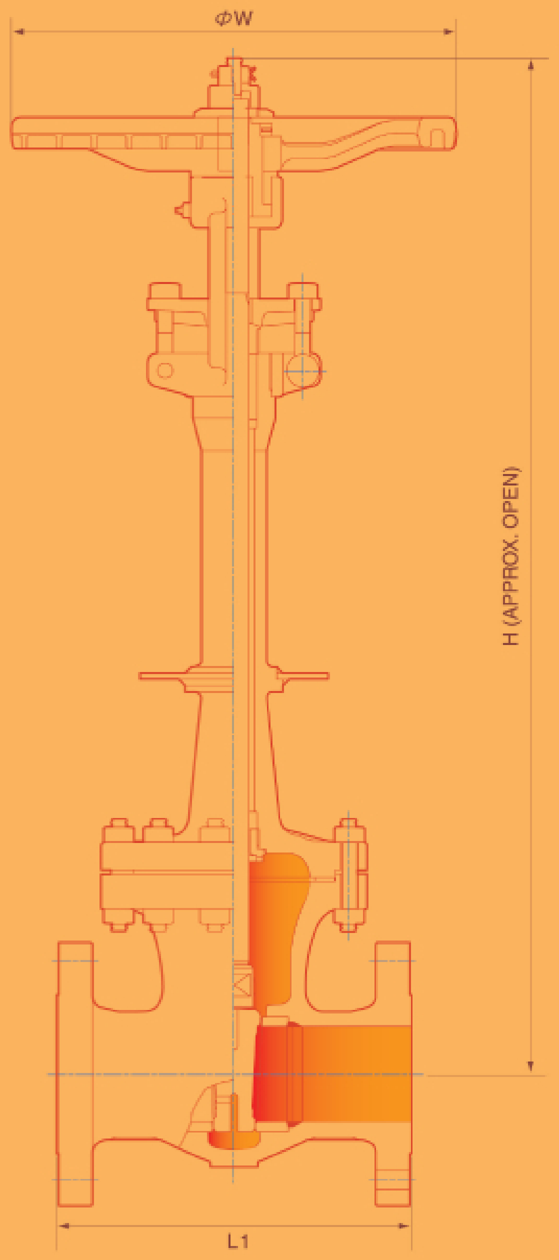
NO	NAME OF PART	ASTM SPECIFICATION			
		HIGH TEMPERATURE SERVICE			
1	BODY	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
2	BONNET	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
3	DISC	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
4	BODY SEAT RING	A240-304	A240-316	A240-304L	A240-316L
5	STEM	A276-304	A276-316	A276-304L	A276-316L
7	BONNET BUSH	A276-304	A276-316	A276-304L	A276-316L
8	PACKING GLAND	A276-304			
9	GLAND FLANGE	A361-CF8			
10	YOKE SLEEVE	A439-D2			
11	BONNET BOLT	A320-B8	A320-B8	A320-B8	A320-B8
12	BONNET NUT	A194-8	A194-8	A194-8	A193-8
13	GLAND BOLT	A193-B8			
14	GLAND NUT	A194-8			
20	HINGE PIN	A276-304			
24	PACKING RING	A276-304	A276-316	A276-304L	A276-316L
25	YOKE	A351-CF8			
27	YOKE BOLT	A193-B7			
28	YOKE NUT	A194-2H			

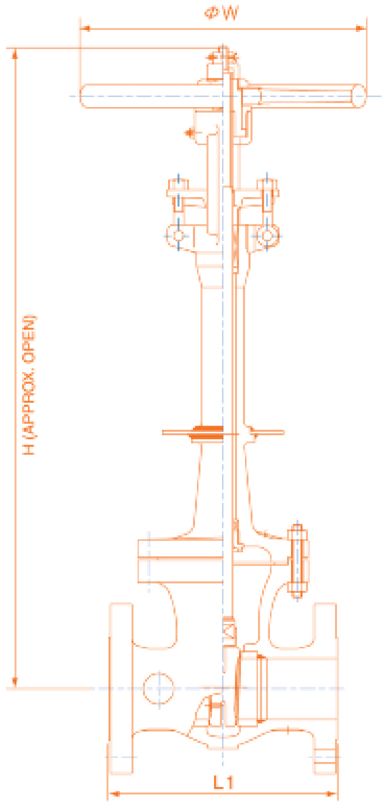
NO	NAME OF PART	ASTM SPECIFICATION
15	**HANDLE NUT**	AISI 304
17	**SLEEVE GLAND**	AISI 304
19	**HANDWHEEL**	A395
21	**PACKING**	COMMERCIAL
22	**GASKET**	COMMERCIAL
23	**GREASE NIPPLE**	STEEL
29	**BEARING**	COMMERCIAL
45	**WASHER**	AISI 304
49	**INSULATION PLATE**	AISI 304
50	**STEM BEARING**	COMMERCIAL
51	**COTTER PIN**	AISI 304
52	**LIFT STOPPER**	AISI 304

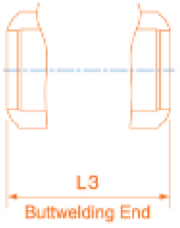


GT CLASS 150LB

VALVE SIZE		inch	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		inch	7.0	7.5	8.0	9.0	10.5	11.5	13.0	14.0	15.0	16.0	17.0
		mm	178	190	203	229	267	292	330	356	381	406	432
L3		inch	8.5	9.5	11.1	12.0	15.9	16.5	18.0	19.8	22.5	24.0	26.0
		mm	216	241	283	305	403	419	457	502	572	610	660
H		inch	29.4	32.5	34.3	37.5	44.4	61.2	67.9	74.3	88.0	97.2	105.0
		mm	748	826	870	953	1127	1554	1725	1887	2234	2469	2666
W		inch	9.8	9.8	11.0	11.8	15.7	17.7	23.6	27.2	28.0	28.0	31.5
		mm	250	250	280	300	400	450	600	690	710	710	800
WEIGHT	RF	inch	79.4	92.6	105.8	158.7	291.0	432.1	610.7	903.9	1106.7	1430.8	1977.5
		mm	36	42	48	72	132	196	277	410	502	649	897
	BW	LB	66.1	79.4	88.2	132.3	264.6	379.2	551.2	837.7	1036.2	1344.8	1889.3
		Kg	30	36	40	60	120	172	250	380	470	610	857

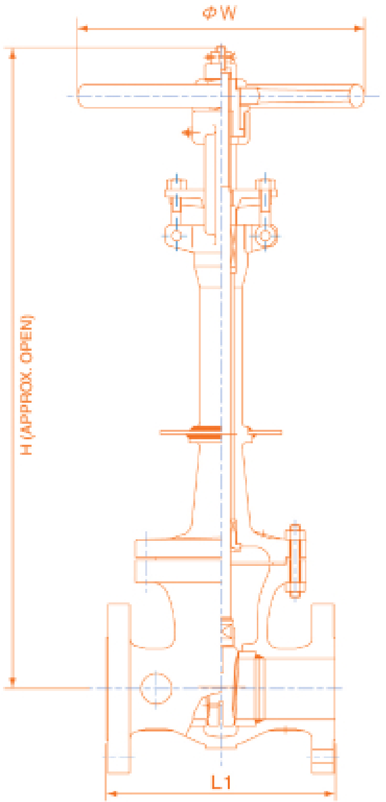


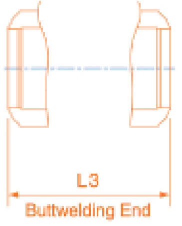


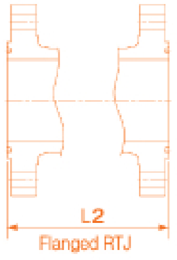


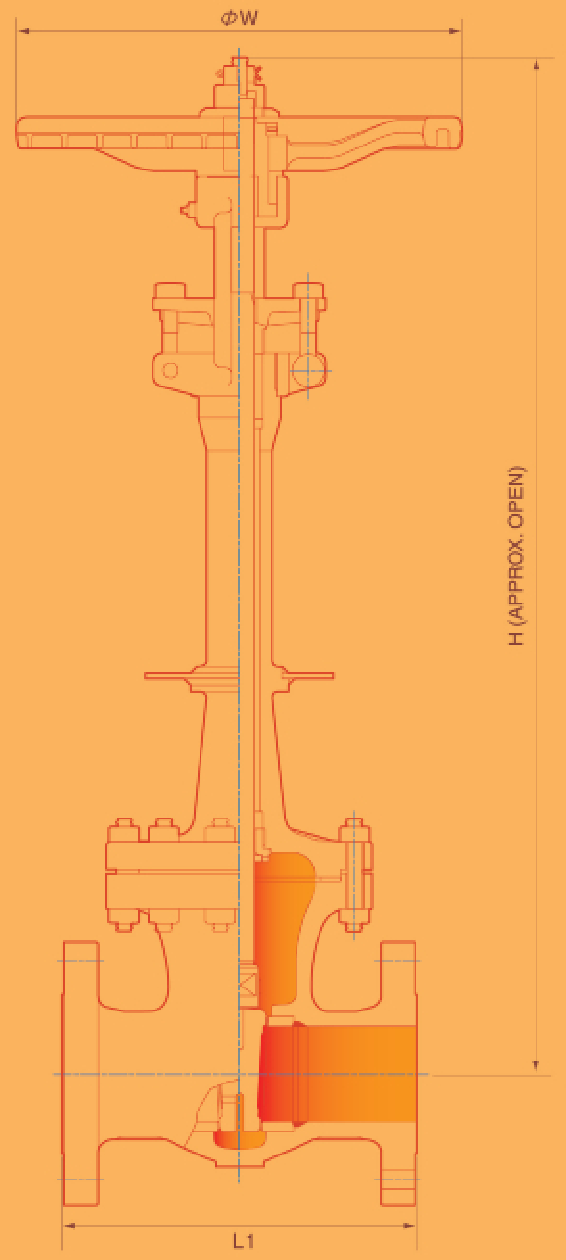
GT CLASS 300LB

VALVE SIZE		inch	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		inch	8.5	9.5	11.1	12.0	15.9	16.5	18.0	19.8	30.0	33.0	36.0
		mm	216	241	283	305	403	419	457	502	762	838	914
L3		inch	9.1	10.1	11.7	12.6	16.5	17.1	18.6	20.4	30.6	33.6	36.6
		mm	232	257	298	321	419	435	473	518	778	854	930
H		inch	30.0	33.5	34.9	38.1	49.5	60.0	68.0	82.1	89.8	101.5	109.5
		mm	763	850	886	969	1257	1524	1726	2085	2281	2579	2782
W		inch	11.8	9.8	14.0	15.7	19.7	27.2	27.2	28.0	35.4	35.4	35.4
		mm	300	250	355	400	500	690	690	710	900	900	900
WEIGHT	RF	inch	88.2	110.2	138.9	205.0	377.0	637.1	943.6	1283.1	1763.7	2578.0	3309.1
		mm	40	50	63	93	171	289	428	582	800	1251	1501
	BW	LB	77.2	94.8	114.6	180.8	352.7	595.2	884.0	1239.0	1717.4	2425.1	3108.5
		Kg	35	43	52	82	160	270	401	562	779	1100	1410



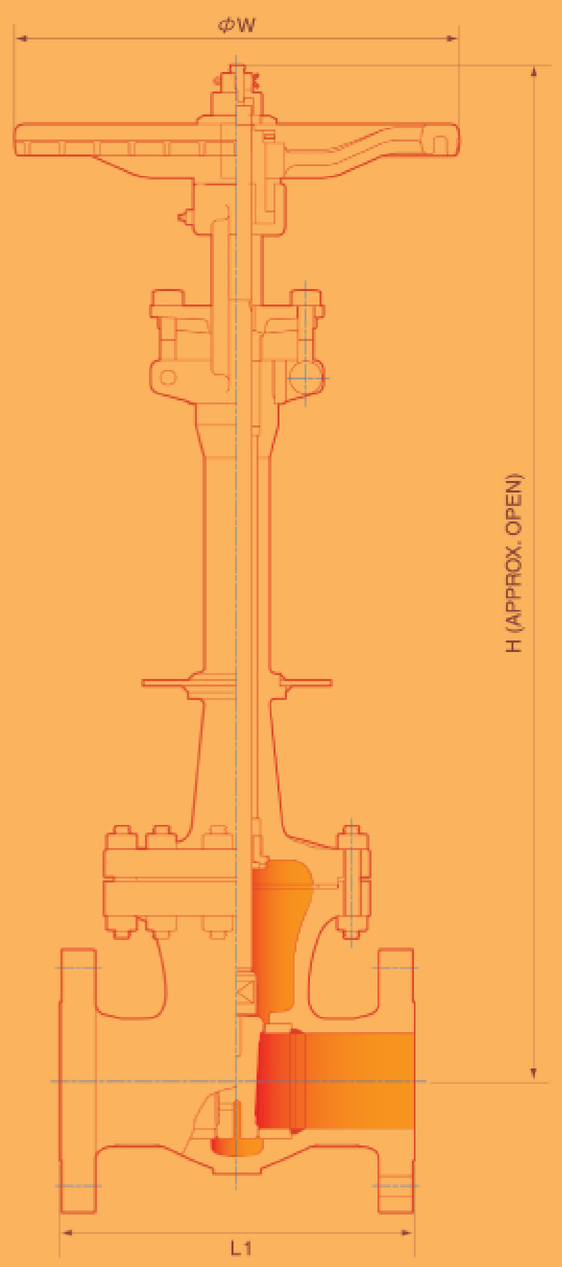


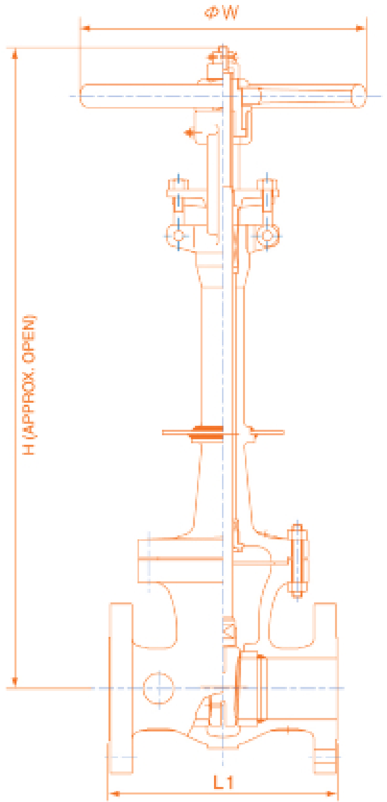


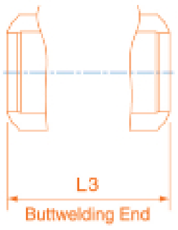


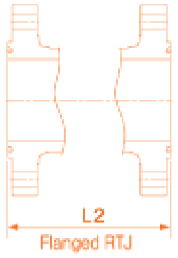
GT CLASS 600LB

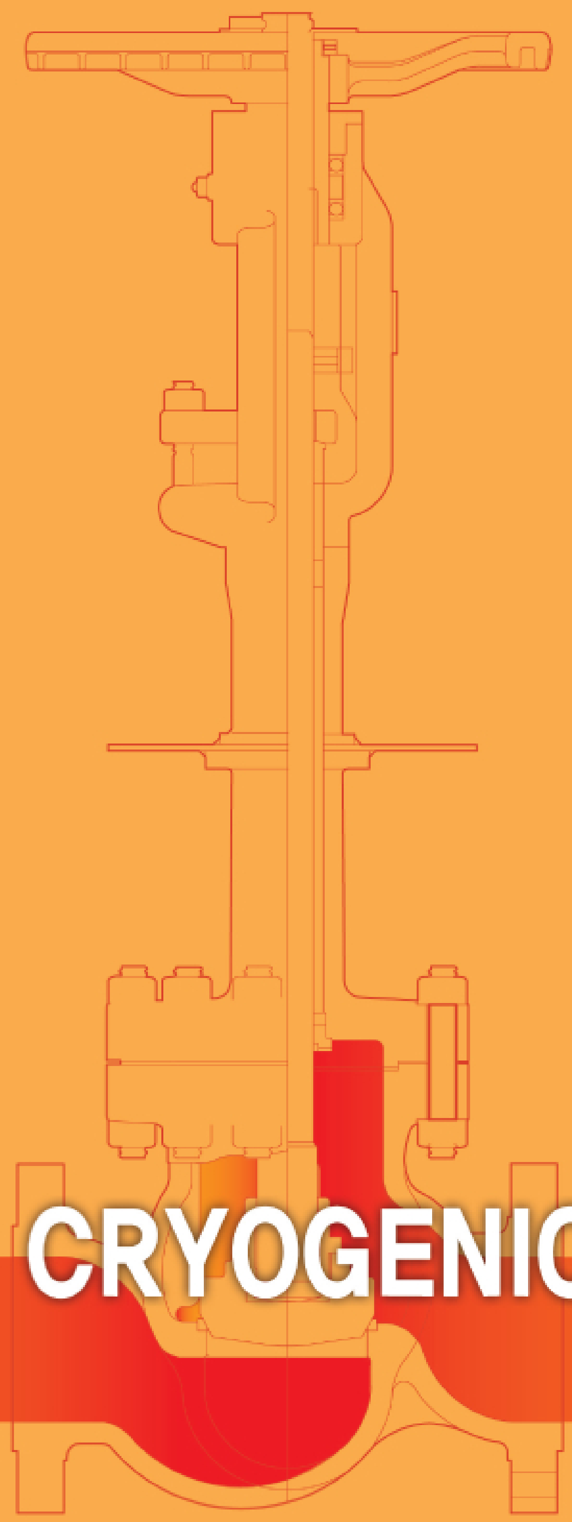
VALVE SIZE	inch	2	2.5	3	4	6	8	10	12	14	16	18
	mm	50	65	80	100	150	200	250	300	350	400	450
L1	inch	11.5	13.0	14.0	17.0	21.9	26.0	31.0	33.0	35.0	39.0	43.0
	mm	292	33.0	356	432	556	660	787	838	889	991	1092
L3	inch	11.6	13.1	14.1	17.1	22.1	26.1	31.1	33.1	35.1	39.1	43.1
	mm	295	333	359	435	562	663	790	841	892	994	1095
H	inch	29.2	35.2	36.4	39.9	53.5	68.2	79.5				
	mm	742	895	924	1014	1359	1733	2020				
W	inch	9.8	9.8	11.0	15.7	23.6	24.8	31.5				
	mm	250	250	280	400	600	630	800				
WEIGHT RF	inch	116.8	154.3	180.8	319.7	674.6	1113.3	1851.9				
	mm	53	70	82	145	306	505	840				
WEIGHT BW	LB	99.2	136.7	154.3	286.6	595.2	1069.2	1818.8				
	Kg	45	62	70	130	270	485	825				









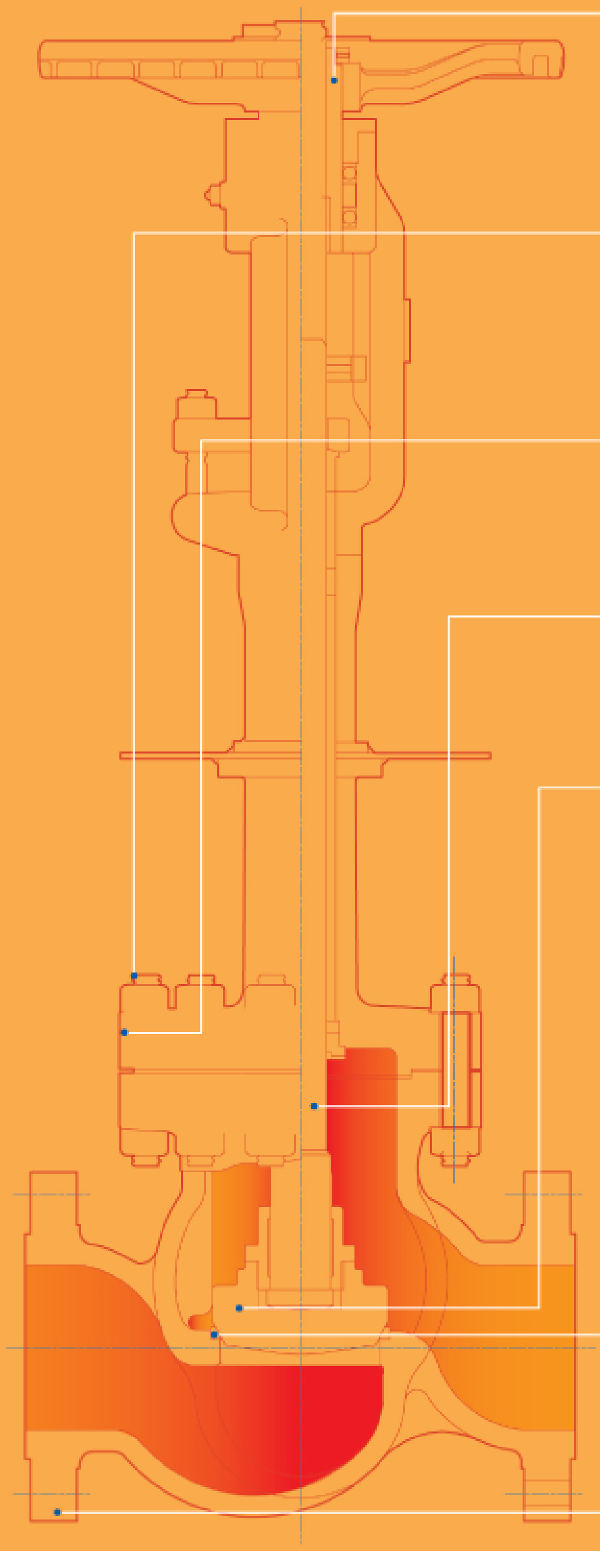


CRYOGENIC GLOBE VALVES

BOLTED BONNET

STAINLESS STEEL

CRYOGENIC GLOBE VALVES BOLTED BONNET



YOKE SLEEVE

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

The body-bonnet bolts are manufactured in accordance with API Std. 600 specifications. The nuts also strictly conform with ANSI B1.1 Strain-hardened austentic stainless steel.

BONNET

Austenitic stainless steel used for bodies and bonnets ofter excellent impact strength, minimize heat loss and protect against corrosion.

STEM

The heat treated stem delivers adequate mechanical properties as well as excellent surface hardness. Further, opening shutting friction is minimized by accurate machining and lapping.

DISC

The disc of our globe valves is a loose disc and can freely revolve around the stem. This 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 mirror finish.

Stellite 6 for all medium and high pressure application prevents seizing and galling.

SEAT RING

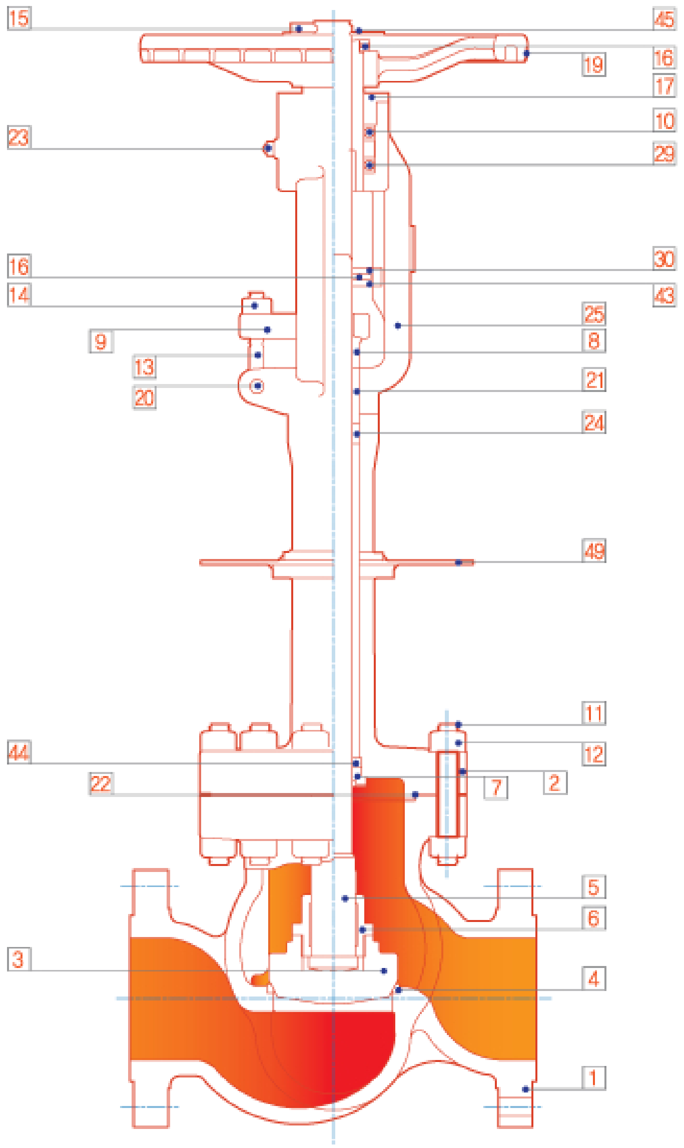
Stellite 6 for all medium and high pressure application prevents seizing and galling.

BODY

Austenitic stainless steel used for bodies and bonnets offer excellent impact strength, minimize heat loss and pretect against corrosion

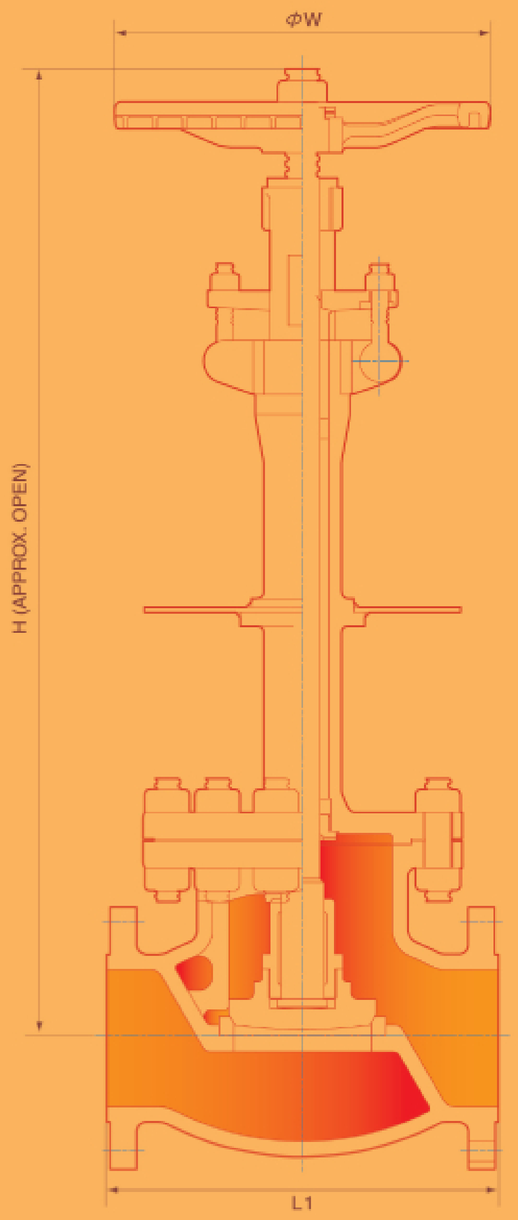
NO	NAME OF PART	ASTM SPECIFICATION			
		HIGH TEMPERATURE SERVICE			
1	BODY	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
2	BONNET	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
3	DISC	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
4	BODY SEAT RING	A240-304	A240-316	A240-304L	A240-316L
5	STEM	A276-304	A276-316	A276-304L	A276-316L
6	DISC GRAND	A276-304	A276-316	A276-304L	A276-316L
7	BONNET BUSH	A276-304	A276-316	A276-304L	A276-316L
8	PACKING GLAND	A276-304			
9	GLAND FLANGE	A351-CF8			
10	YOKE SLEEVE	A439-D2			
11	BONNET BOLT	A320-B8	A320-B8	A320-B8	A320-B8
12	BONNET NUT	A194-8	A194-8	A194-8	A193-8
13	GLAND BOLT	A193-B8			
14	GLAND NUT	A194-8			
20	HINGE PIN	A276-304			
24	PACKING RING	A276-304	A276-316	A276-304L	A276-316L
25	YOKE	A351-CF8	A351-CF8	A351-CF8	A351-CF8

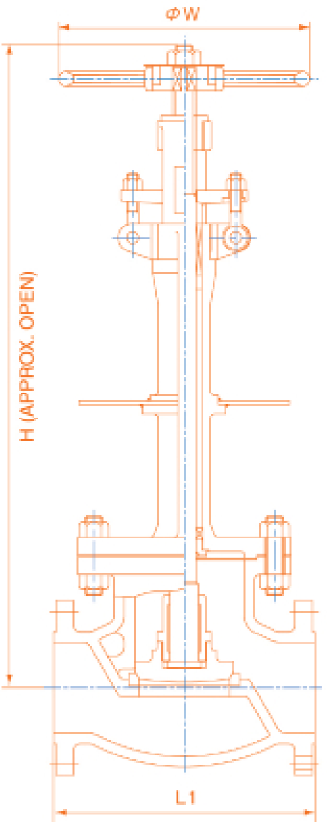
NO	NAME OF PART	ASTM SPECIFICATION
15	**HANDLE NUT**	AISI 304
16	**SET SCREW**	STEEL
17	**SLEEVE GLAND**	AISI 304
19	**HANDWHEEL**	A 395
21	**PACKING**	COMMERCAIL
22	**GASKET**	COMMERCAIL
23	**GREASE NIPPLE**	STEEL
29	**BEARING**	COMMERCAIL
30	**STOPPER**	A283-D
43	**KEY**	CARBON STEEL
44	**STEM BEARING**	COMMERCAIL
45	**WASHER**	AISI 304
49	**INSULATION PLATE**	AISI 304

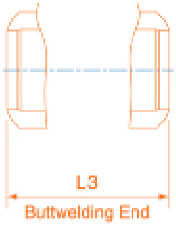


GL CLASS 150LB

VALVE SIZE		inch	2	2.5	3	4	6	8
		mm	50	65	80	100	150	200
L1&L3		inch	8.0	8.5	9.5	11.5	16.0	19.5
		mm	203	216	241	292	406	495
H		inch	31.0	30.6	32.8	34.0	38.3	43.7
		mm	788	776	833	864.5	974	1110
W		inch	8.8	9.8	14.0	15.7	17.7	22.0
		mm	224	250	355	400	450	560
WEIGHT	RF	inch	75.0	99.2	119.0	185.2	315.3	429.9
		mm	34	45	54	84	143	195
	BW	LB	63.9	83.8	99.2	158.7	288.8	385.8
		Kg	29	38	45	72	131	175

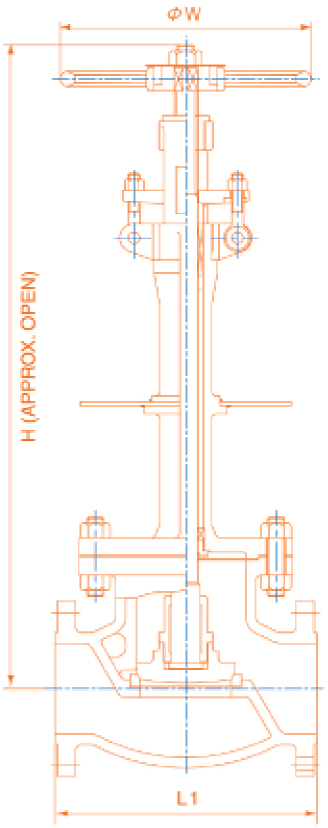


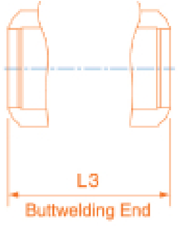


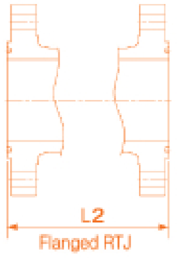


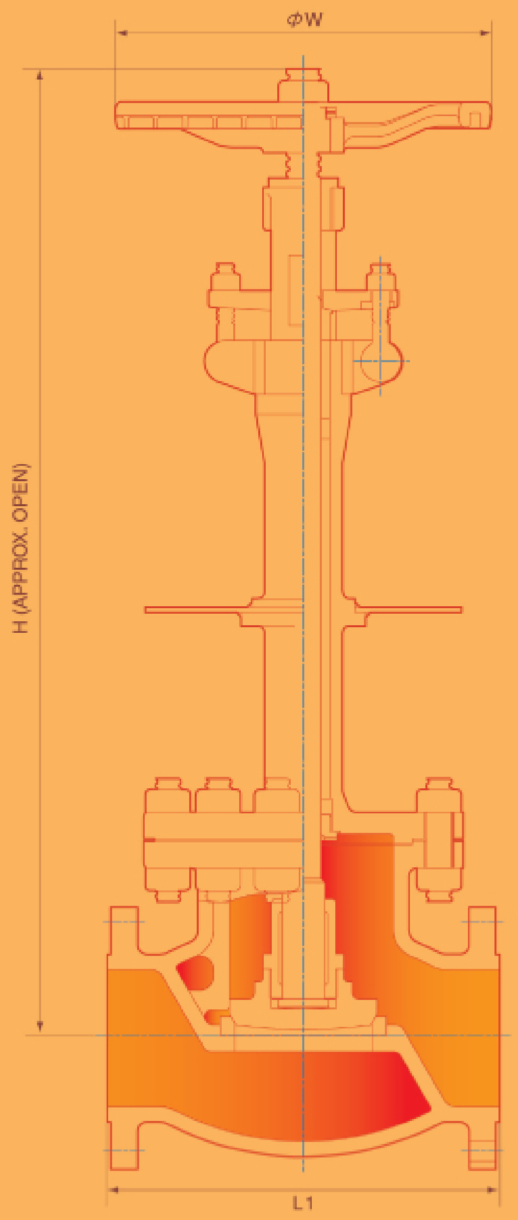
GL CLASS 300LB

VALVE SIZE		inch	2	2.5	3	4	6	8
		mm	50	65	80	100	150	200
L1&L3		inch	10.5	11.5	12.5	14.0	17.5	22.0
		mm	267	292	318	356	444	559
L2		inch	11.1	12.1	13.1	14.6	18.1	22.6
		mm	283	308	333	371	460	575
H		inch	27.2	28.3	29.8	36.7	43.0	47.2
		mm	690	720	756	932	1092	1200
W		inch	9.8	11.0	14.0	23.6	22.0	28.0
		mm	250	280	355	300	560	710
WEIGHT	RF	inch	83.8	99.2	141.1	410.1	449.7	551.2
		mm	38	45	64	186	204	250
	BW	LB	66.1	81.6	121.3	374.8	407.9	496.0
		Kg	30	37	55	170	185	225



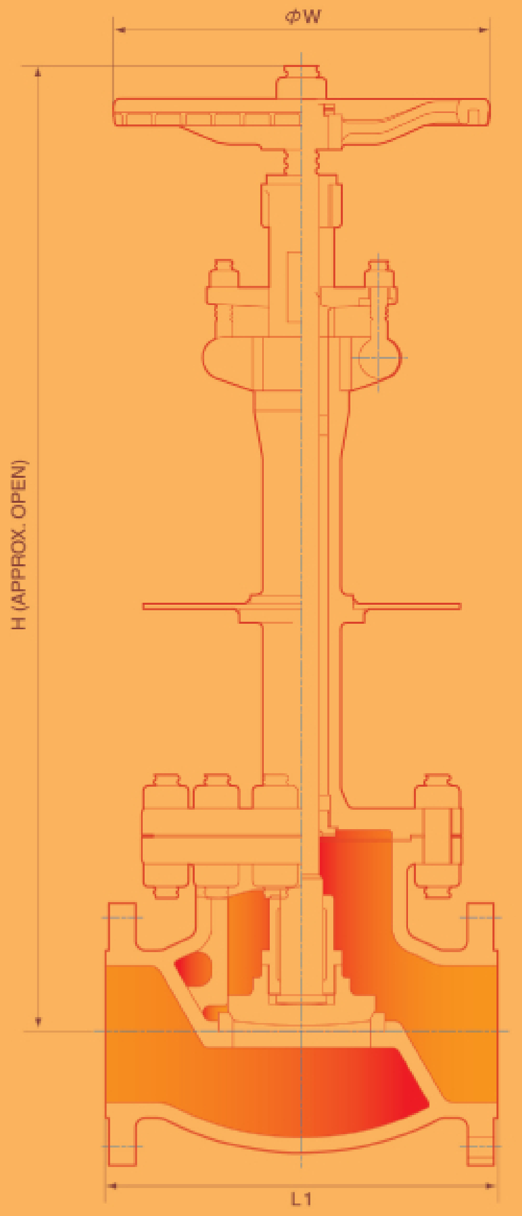


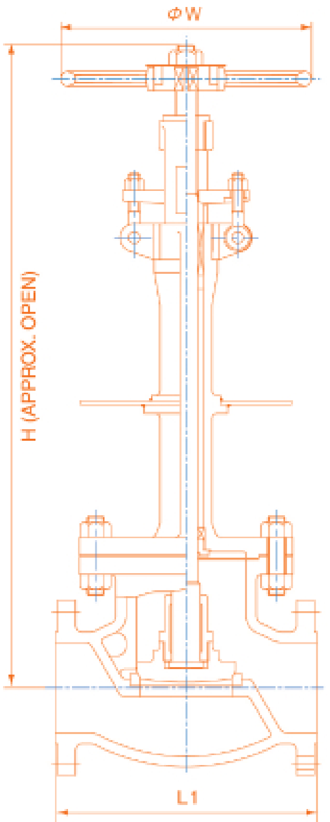


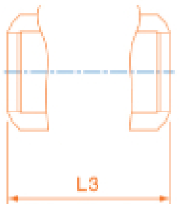


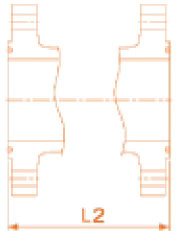
GL CLASS 600LB

VALVE SIZE		inch	2	2.5	3	4	6	8
		mm	50	65	80	100	150	200
L1&L3		inch	11.5	13.0	14.0	17.0	22.0	26.0
		mm	292	330	356	432	559	660
L2		inch	11.6	13.1	14.1	17.1	22.1	26.1
		mm	295	333	359	435	562	664
H		inch	27.8	31.6	31.7	34.2	41.7	44.3
		mm	707	802	805	868	1059	1125
W		inch	11.0	14.0	17.7	22.0	28.0	31.5
		mm	280	355	450	560	710	800
WEIGHT	RF	inch	154.3	176.4	198.4	339.5	749.6	1433
		mm	70	80	90	154	340	650
	BW	LB	121.3	143.3	172.0	297.6	705.5	1254
		Kg	55	65	78	135	320	570



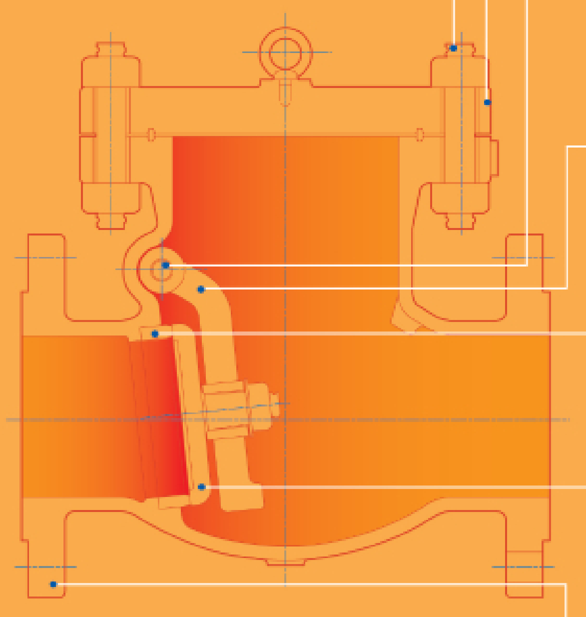



L3
Buttwelding End


L2
Flanged RTJ

STAINLESS STEEL

CRYOGENIC SWING CHECK VALVES BOLTED BONNET



BOLTING

The body-cover bolting conforms with ANSI B.1.1
The nuts are manufactured to conform with ANSI B18.2.2
Strain-hardened austentic stainless steel

COVER

Austenitic stainless steel used for bodies and bonnets offer excellent impact strength, minimize heat loss and protect against corrosion.

HINGE PIN

The hinge pin is insrted 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 the 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.
Stellite 6 for all medium and high pressure application prevents seizing and galling

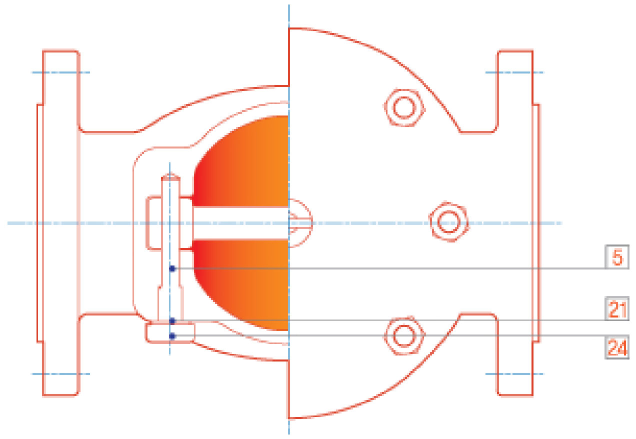
BODY

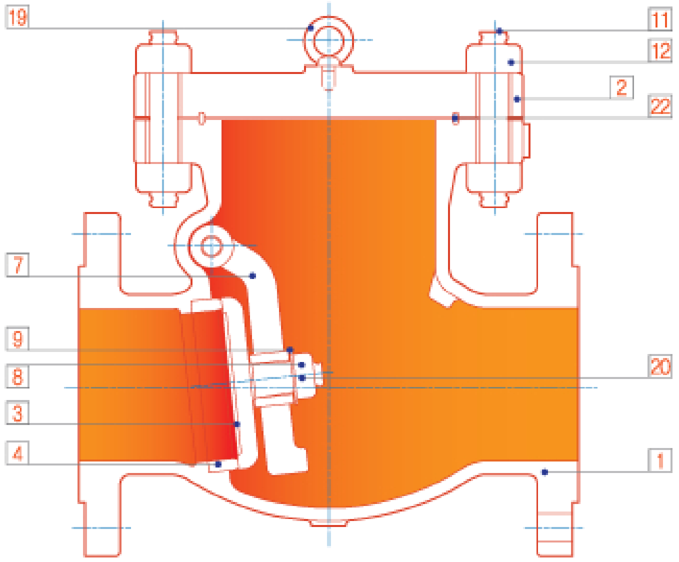
Austenitic stainless steel used for bodies and bonnets offer excellent impact strength, minimize heat loss and protect against corrosion

STAINLESS STEEL

NO	NAME OF PART	ASTM SPECIFICATION			
		STAINLESS STEEL			
1	BODY	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
2	COVER	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
3	DISC	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
4	BODY SEAT RING	A240-304	A240-316	A240-304L	A240-316L
5	HINGE PIN	A276-304	A276-316	A276-304L	A276-316L
7	ARM	A351-CF8	A351-CF8M	A351-CF3	A351-CF3M
11	BONNET BOLT	A320-B8	A320-B8	A320-B8	A320-B8
12	BONNET NUT	A194-8	A194-8	A194-8	A193-8

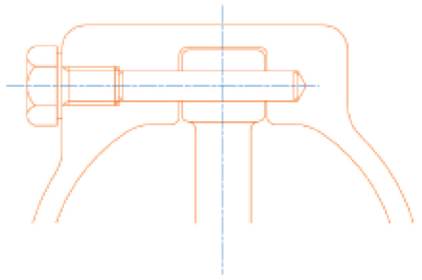
NO	NAME OF PART	ASTM SPECIFICATION
8	**DISC NUT**	A194-8
9	**DISC WASHER**	A240-304
15	**EVE BOLT**	A105
20	**SPRIT PIN**	AISI 304
21	**PLUG GASKET**	COMMERCIAL
22	**GASKET**	COMMERCIAL
24	**PLUG**	A105



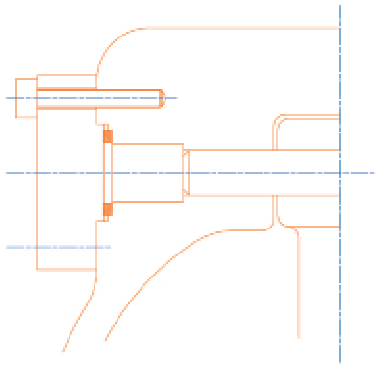


SW/CH CLASS 150LB

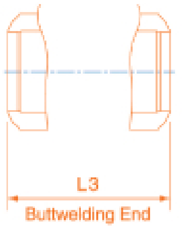
VALVE SIZE			2	2.5	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	36
		mm	50	65	80	100	150	200	250	300	350	400	450	500	600	650	700	750	800	900
L1&L3		inch	8.0	8.5	9.5	11.5	14.0	19.5	24.5	27.5	31.0	34.0	38.5	38.5	51.0	51.0	57.0	60.0	60.0	77.0
		mm	203	216	241	292	356	495	622	698	787	864	978	978	1295	1295	1448	1524	1524	1956
H		inch	5.8	6.4	6.9	8.0	11.4	13.8	16.9	19.6	23.9	25.6	30.7	25.5	31.5	33.5	40.0	35.0	37.0	53.1
		mm	147	163	176	204	290	350	428	499	606	650	781	647	800	852	1017	888	941	1349
WEIGHT	RF	inch	35.3	48.5	66.1	97.0	172.0	260.1	520.3	758.4	930.3	1397.7	1798.9	2164.9	3924.2	3637.6	3825.0	4647.3	5291.0	7385.4
		mm	16	22	30	44	78	118	236	344	422	634	816	982	1780	1650	1735	2108	2400	3350
	BW	LB	28.7	33.1	46.3	57.3	136.7	200.6	449.7	645.9	661.4	1276.5	1547.6	1878.3	3584.7	3306.9	3223.1	4426.8	4960.3	6944.5
		Kg	13	15	21	26	62	91	204	293	300	579	702	852	1626	1500	1462	2008	2250	3150

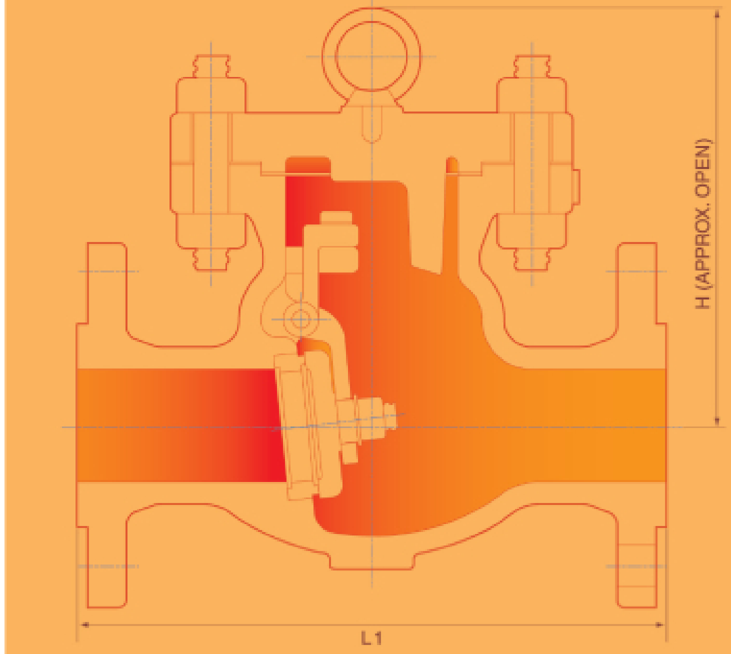


14˝ Thru 18˝



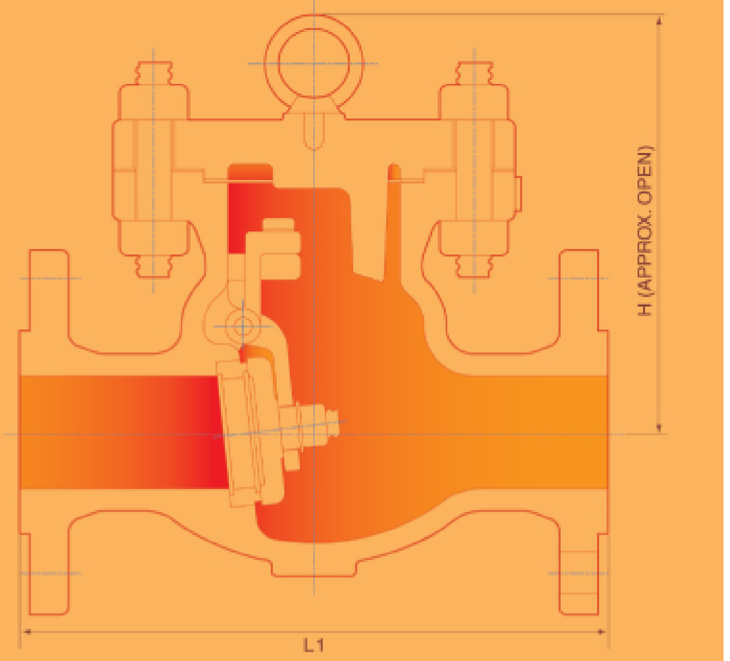
20˝ & Lager

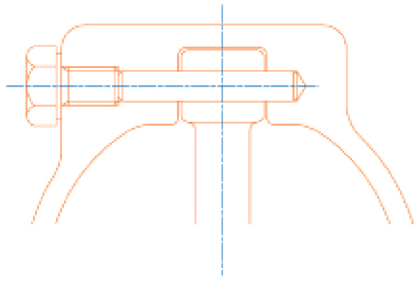


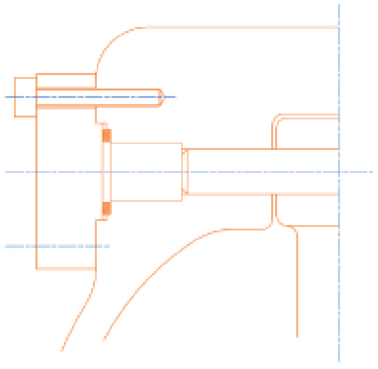


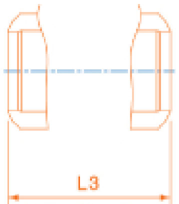
SW/CH CLASS 300LB

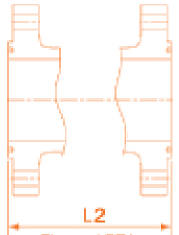
VALVE SIZE		inch	2	2.5	3	4	6	8	10	12	14	16	18	20	24	28	30	36
		mm	50	65	80	100	150	200	250	300	350	400	450	500	600	700	750	900
L1&L3		inch	10.5	11.5	12.5	14.0	17.5	21.0	24.5	28.0	33.0	34.0	38.5	40.0	53.0	59.0	62.8	82.0
		mm	267	292	318	356	444	533	622	711	838	864	978	1016	1346	1499	1594	2083
H		inch	11.1	12.1	13.1	14.6	18.1	21.6	25.1	28.6	33.6	34.6	39.1	40.7	53.9	60.0	63.7	83.1
		mm	283	308	333	371	460	549	638	727	854	880	994	1035	1368	1524	1619	2111
W		inch	6.4	7.1	7.8	8.7	13.1	15.0	18.8	21.1	22.8	27.4	31.4	30.5	40.4	45.2	50.0	46.1
		mm	163	180	197	220	332	380	477	535	580	695	797	775	1025	1149	1270	1171
WEIGHT	RF	inch	52.9	81.6	99.2	149.9	302.0	485.0	595.2	1091.3	1499.1	2094.4	2645.5	3306.9	4850.1	6172.9	7495.6	11022.9
		mm	24	37	45	68	137	220	270	495	680	950	1200	1500	2200	2800	3400	5000
	BW	LB	46.3	66.1	77.2	112.4	242.5	401.2	463.0	925.9	1157.4	1763.7	2202.4	2689.6	4060.9	5291.0	6503.5	9063.1
		Kg	21	30	35	51	110	182	210	420	525	800	999	1220	1842	2400	2950	4111




14˝ Thru 18˝

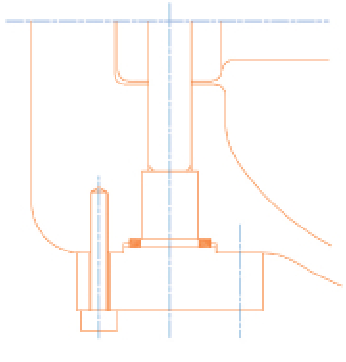

20˝ & Lager

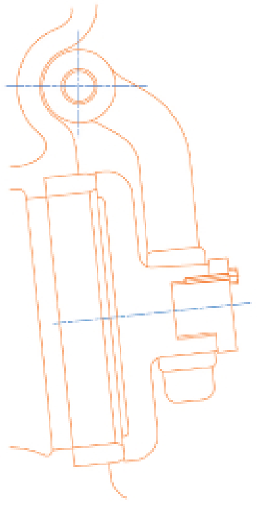

L3
Buttwelding End

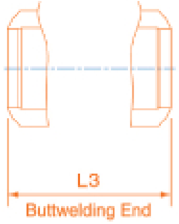

L2
Flanged RTJ

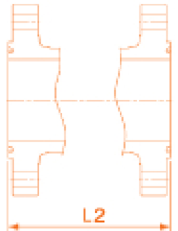
SW/CH CLASS 600LB

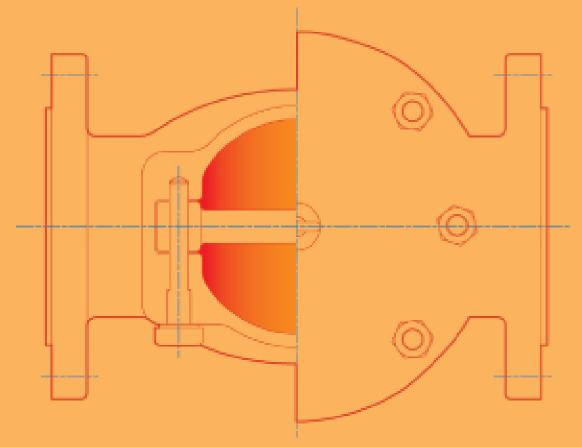
VALVE SIZE		inch	2	2.5	3	4	6	8	10	12	14	16	18	20	24	28	30
		mm	50	65	80	100	150	200	250	300	350	400	450	500	600	700	750
L1&L3		inch	11.5	13.0	14.0	17.0	22.0	26.0	31.0	33.0	35.0	39.0	43.0	47.0	55.0	63.0	65.0
		mm	292	330	356	432	559	660	787	838	889	991	1092	1194	1397	1600	1651
L2		inch	11.6	13.1	14.1	17.1	22.1	26.1	31.1	33.1	35.1	39.1	43.1	47.2	55.4	63.5	65.5
		mm	295	333	359	435	562	664	791	841	892	994	1095	1200	1407	1613	1664
H		inch	8.3	8.6	10.5	12.2	15.5	21.2	24.6	24.4	26.8	32.0	37.8	40.5	47.3	54.6	51.7
		mm	210	219	267	310	393	538	625	620	680	812	960	1029	1202	1388	1313
WEIGHT	RF	inch	88.2	121.3	158.7	253.5	551.1	925.9	1349.2	1785.7	1984.1	2971.8	4448.9	5264.6	7195.8	9038.8	11022.9
		mm	40	55	72	115	250	420	612	810	900	1348	2018	2388	3264	4100	5000
	BW	LB	83.8	99.2	138.9	176.4	451.9	762.8	1078.0	1472.7	1940.0	2464.7	3798.5	4437.8	6011.9	7716.1	9261.5
		Kg	38	45	63	80	205	346	489	668	880	1118	1723	2013	2727	3500	4201

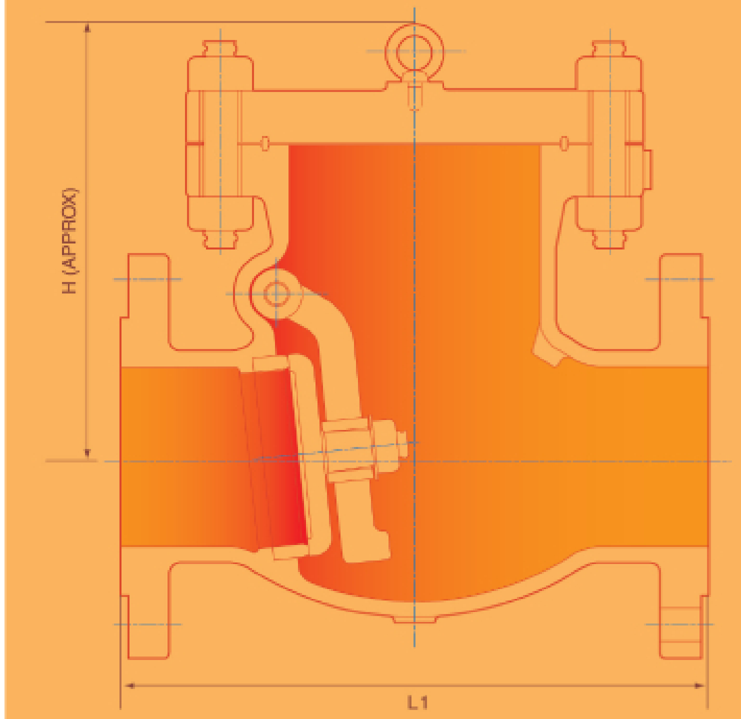

16˝ Lager

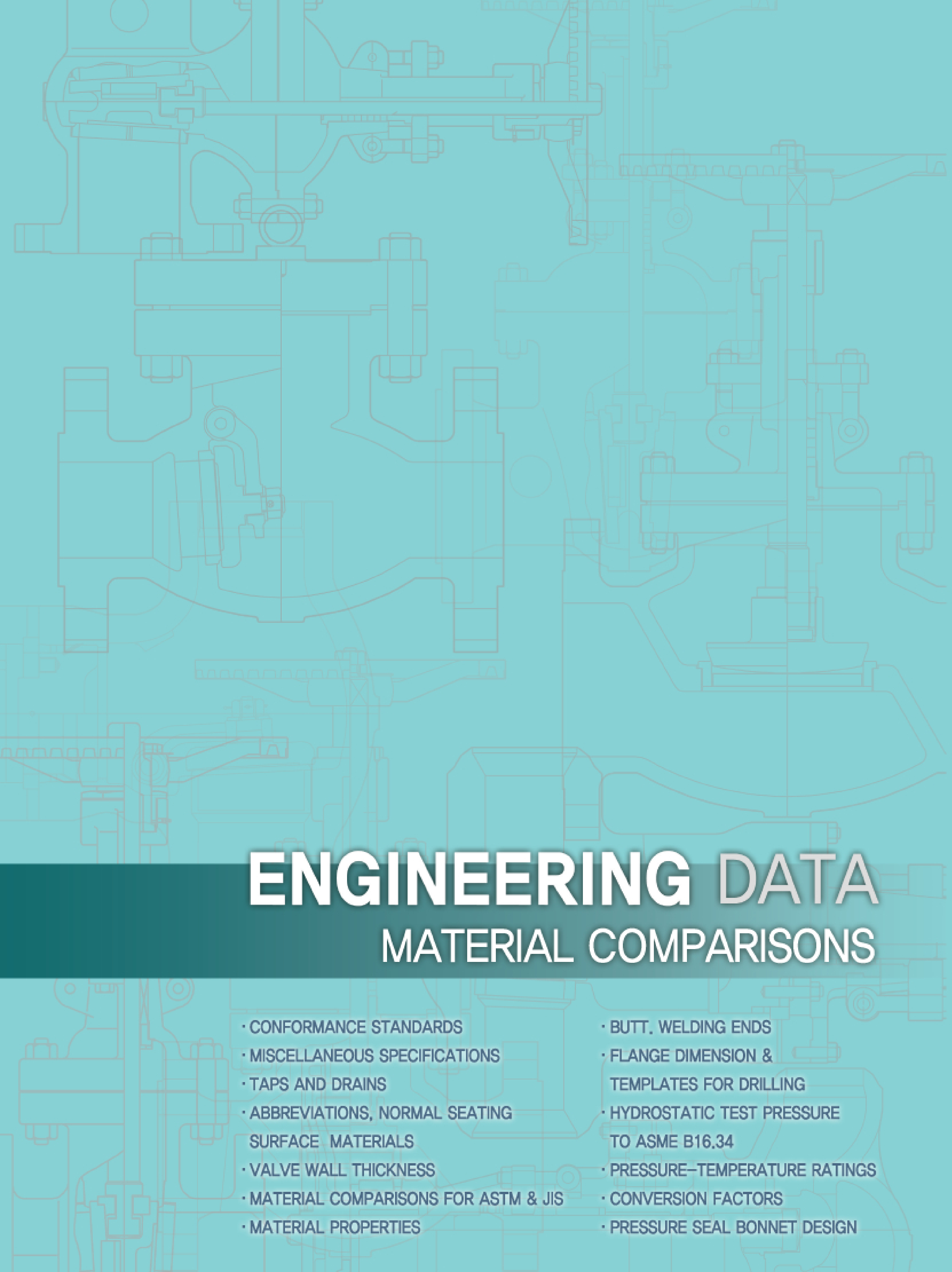

18˝ Lager


L3
Buttwelding End


L2
Flanged RTJ







ENGINEERING DATA

MATERIAL COMPARISONS

- CONFORMANCE STANDARDS
- MISCELLANEOUS SPECIFICATIONS
- TAPS AND DRAINS
- ABBREVIATIONS, NORMAL SEATING SURFACE MATERIALS
- VALVE WALL THICKNESS
- MATERIAL COMPARISONS FOR ASTM & JIS
- MATERIAL PROPERTIES
- BUTT. WELDING ENDS
- FLANGE DIMENSION & TEMPLATES FOR DRILLING
- HYDROSTATIC TEST PRESSURE TO ASME B16.34
- PRESSURE–TEMPERATURE RATINGS
- CONVERSION FACTORS
- PRESSURE SEAL BONNET DESIGN

CONFORMANCE STANDARDS

HK 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-Ends 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 glove 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	10 kg/㎝ Cast Steel Flanged Globe Valves
JIS B2073 Latest Edition	10 kg/㎝ Cast Steel Flanged Gate Valves (Outside Screw Type)
JIS B2074 Latest Edition	10 kg/㎝ Cast Steel Flanged Swing Check Valves
JIS B2081 Latest Edition	20 kg/㎝ Cast Steel Flanged Globe Valves
JIS B2083 Latest Edition	20 kg/㎝ Cast Steel Flanged Gate Valves (Outside Screw Type)
JIS B2084 Latest Edition	20 kg/㎝ 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 (Class 600 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	Manufacturuers Standardization society of the Valve and Fitting Industry

BS	British Standards Institution
JIS	Japanese Industrial Standards
JPI	Japan Petroleum Institute
NACE	National Association of
AWS	Corrosion Engineers American Welding Society

GENERAL DESIGN SPECIFICATIONS

ITEMS	AMERICAN STANDARD	BRITISH STANDARD
Shell wall thickness and general valve design specifications	API 600/ASME B16.34	BS1414(Gate valve) BS1873(Globe valve) BS1868(Check valve)
Pressure-temperature ratings	ASME B16.34	BS1560
Face - to - face dimensions End - to - end dimensions	ASME B16.10	BS2080
End flange dimensions Gasket contact facing	ASME B16.5·	BS1560
Welding end dimensions	ASME B16.25	BS1414(Gate valve) BS1873(Globe valve) BS1868(Check valve)

·MSS SP-44 FOR 22" and ASME B16.47 Series B for 26" and larger, for end flange dimensions.

VALVE SHEEL MATERIALS

SERVICE TEMPERATURE		NOMINAL DESIGNATION	ASTM(CASTING)
MIN TEMP°F(°C)	MAX TEMP°F(°C)		SPECIFICATION
-20(-29)	1000(538)	Carbon Steel	A216-WCB
-20(-29)	1000(538)	C-1/2 Mo	A217-WC1
-20(-29)	1100(593)	1 1/4Cr-1/2Mo	A217-WC6
		2 1/4Cr-1/2Mo	A217-WC9
-20(-29)	1200(649)	5Cr-1/2Mo(C 0.15)	A217-C5
		9Cr-1Mo(C 0.25)	A217-C12
-50(-46)	650(343)	Carbon Steel for Low Temp	A352-LCB
-75(-59)	650(343)	C-1/2Mo for Low Temp	A351-LC1
-100(-73)	650(343)	C-2 1/2Ni	A352-LC2
-150(-101)	650(343)	3 1/2Ni	A352-LC3
-425(-254)	1500(816)	18Cr-8Ni(C 0.08)	A352-CF8
	800(427)	18Cr-8Ni(C 0.03)	A351-CF3
	1500(816)	18Cr-9Ni-2Mo(C 0.08)	A351-CF8M
	800(454)	18Cr-9Ni-2Mo(C 0.03)	A351-CF3M
-328(-200)	1500(816)	18Cr-10Ni-Cb(C 0.08)	A351-CF8C
-328(-200)	2192(1200)	19Cr-27Ni-2Mo-3Cu(C 0.07)	A351-CN7M

·Refer to ASME B16.34 for details of ASTM A216, A217 and A352 Pressure-temperature ratings.
The minimum working temperatures of ASTM A352 are based on ASME B31.3

HK LOW TEMPERATURE SERVICE VALVES

Han Kook Valve offers Class 150, 300 and 600 API design low alloy steel valves for sub-zero temperature service down to 101°C(-150°F). Detailed design information are available on request.

GASKET & PACKING MATERIAL

Following gasket & packing materials are standard.
Optional materials depending on service conditions, available upon request.

TYPE	GRAPHITE MATERIAL		P.T.F.E. MATERIAL	
	TYPE	PERFORMANCE	TYPE	PERFORMANCE
GASKET	CLASS 150 : CORRUGATED GRAPHITE	TEMP LIMITATION -20 TO 1086°F	CLASS 150 : P.T.F.E. SOLID GASKET	TEMP LIMITATION -148 TO 302°F
	CLASS 300 ~ 1500 : SPIRAL WOUND GRAPHITE WITH SS INNER RING	TEMP LIMITATION -454 TO 1598°F	CLASS 300 ~ 1500 : SPIRAL WOUND P.T.F.E. SOLID WITH SS INNER RING	TEMP LIMITATION -328 TO 500°F
PACKING	TOP AND BOTTOM WIPER RINGS OF CARBON FIBER INNER RINGS OF PURE GRAPHITE	TEMP LIMITATION -418 TO 932°F	BRAIDED P.T.F.E. FIBER	TEMP LIMITATION -58 TO 500°F

BONNET GASKET MATERIALS

Depending on class ratings and servicing conditions, following gasket materials are available for body/bonnet flange gaskets of HK cast steel valves. Specify your gasket material in purchase order.

GASKET MATERIAL	CLASS					
	150	300	600	900	1500	2500
Corrugated metal	●	●				
Ring joint metal			●	●	●	●
Spiral wound metal, PTFE filled		●				
Flexable graphite	●					
Spiral wound metal, flexible graphite filled		●				
Stainless steel inserted flexible graphite	●					
Ceramics filled PTFE	●					
Compressed asbestos	●	●				
Spiral wound metal, asbestos filled		●				

Contact Han Kook Valve or your HK distributors for optional requirement of gasket or gland packing materials other than listed above.

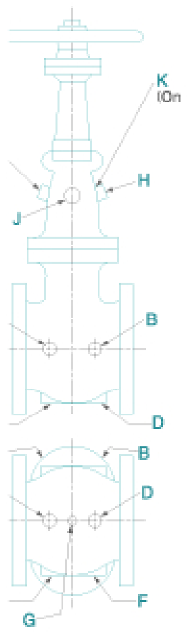
TAP AND DRAINS

When specified, valves can be furnished with drain connections at any of the locations shown.
Standard drain connections are the same size as shown below and are drilled, tapped and plugged.

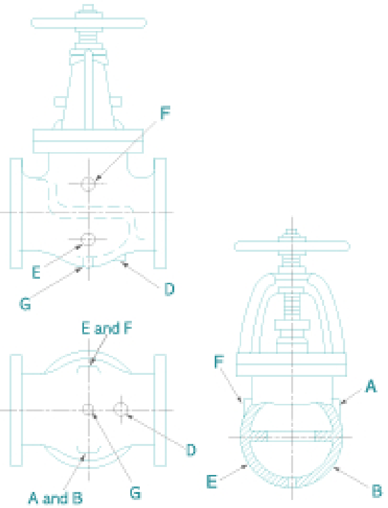
•BUTT WELDING FOR

MAIN VALVE SIZE	2″ ~ 4″	5″ ~ 8″	10″and UP
DRAIN SIZE	½″	¾″	1″

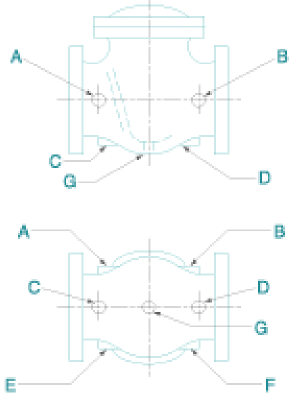
ASME B16.34. 1996



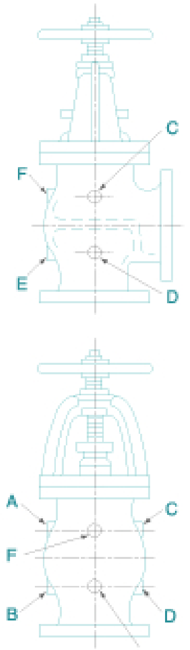
Gate Valve



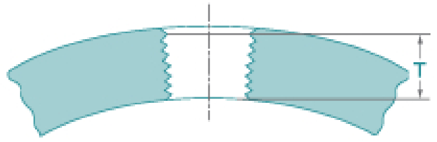
Globe Valve



Swing Check Valve



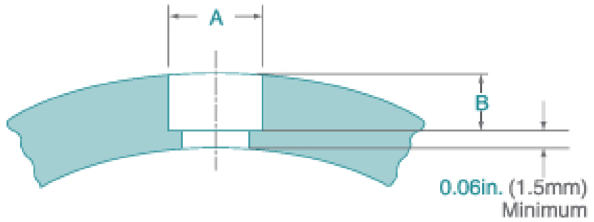
Angle Valve



•THREAD LENGTH FOR AUXILIARY CONNECTIONS

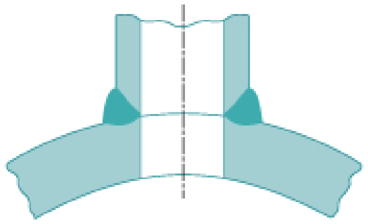
Conn. Size. NPS		⅜	½	¾	1	1⅛	1½	2
LENGTH OF THREAD. T	in	0.41	0.53	0.56	0.68	0.71	0.72	0.76
	mm	11	14	14	18	18	19	20

In no case shall the effective length of thread, T, be less than that shown in table above. These lengths are equal to the effective thread length of American National Standard External Pipe Thread(ANSI 82.1)

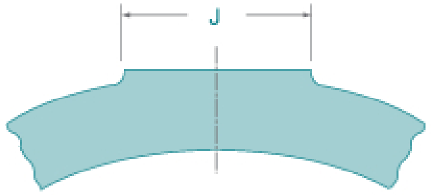


•SOCKET WELDING FOR AUXILIARY CONNECTIONS

Conn. Size. NPS		⅜	½	¾	1	1⅛	1½	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. Depth of Socket, B	in	0.19	0.19	0.25	0.25	0.25	0.25	0.31
	mm	5	5	605	6.5	6.5	6.5	8



•BUTT WELDING FOR AUXILIARY CONNECTIONS



•BOSSES FOR AUXILIARY CONNECTIONS

Conn. Size. NPS		⅜	½	¾	1	1⅛	1½	2
Dia of Boss, J	in	1.25	1.50	1.75	2.12	2.50	2.75	3.38
	mm	32	38	44	54	64	70	86

ABBREVIATONS

ASB	Asbestos
BB	Bolted Bonnet
BC	Bolted Cover
BE	Bevel End
BW	Butt Weld
EB	Extension Bonnet
EC	External Coating
EPDM	Ethylene Propylene Diene Monomer
FEP	Fluorinated Ethylene Propylene
FF	Flat Face
FLGD	Flanged
HEX	Hexagonal
HF	Hard Face
IC	Internal Coating
IS	Inside Screw
M.BOLT	Machine Bolt
NB	Non Bonnet
NBR	Nitrile or Bonnet-N Rubber
NRS	Non Rising Stem
OCT	Octagonal Ring Gasket
OS & Y	Outside Screw & Yoke
OVAL	Oval Ring Gasket
PB	Pressure Seal Bonnet
PE	Plain End

PTFE	Poly Tetra Fluore Ethylene
PVE	Poly Vinyl Chloride
RF	Raised Face
RS	Rising Stem
RTJ	Ring Type Joint
SB	Screwed Bonnet
S.BOLT	Stud Bolt
SC	Screwed Cap
SCH	Schedule
SCRD	Screwed
SF	Smooth Finish
SH	Hard Facing Treatment
SMLS	Seamless Product
SO	Slip-On
STD	Standard
SW	Socket Weld
TE	Thread End
TFE	Tetra Fluoro Ethylene
UB	Union Bonnet
UC	Union Cap
WB	Welded Bonnet
WC	Welded Cap
WN	Welding Neck

NOMINAL SEATING SURFACE MATERIALS

Trim No.	Norminal No.	Seat Hardness (HBa, min)	Typical Specifications(Grade)			
			Material Type	Cast	Forged	Welde
1	F6	b	13Cr	ASTM A217(CA15)	ASTM A182(F6a)	AWS A5.9 ER410
2	304	c	18Cr-8Ni	ASTM A341(CF8)	ASTM A182(F304)	AWS A5.9 ER308
3	F310	c	20Cr-20Ni		ASTM A182(F310)	AWS A5.9 ER310
4	Hard F6	750d	Hard 14 Cr		e	
5	Hardfaced	350d	Co Cr-Ah			AWS A5.13 ERCoCr-A
5A	Hardfaced	350d	Ni-Cr			i
6	F6 and	250f	13Cr	ASTM A217(CA15)	ASTM A182(F6a)	AWS A5.9 ER410
	C-Ni	175f	Cu-Ni		g	
7	F6 and	300f	14Cr	ASTM A217(CA15)	ASTM A182(F6a)	AWS A5.9 ER410
	Hard Faced	750f	Hard 13 Cr		e	
8	F6 and	300f	13Cr	ASTM A217(CA15)	ASTM A182(F6a)	AWS A5.9 ER410
	Hardfaced	350f	C0-CrAh			AWS A5.9 ERCoCr-A
8A	F6 and	300f	13Cr	ASTM A217(CA15)	ASTM A182(F6a)	AWS A5.9 ER410
	Hardfaced	350f	Ni-Cr			i
9	Monel	c	Ni-Cu alloy		Manufacture's standard	
10	316	c	18Cr-8Ni	ASTM A351(CF8M)	ASTM A182(F316)	AWS A5.9 ER410
11	Monel and	c	Ni-Cu alloy		Manufacture's standard	
	Hardfaced	350f	Trim 5 or 5A			See Trim 5 or 5A
12	316 and	c	18Cr-8Ni	ASTM A351(CF8M)	ASTM A182(F316)	AWS A5.9 ER316
	Hardfaced	350f	Trim 5 or 5A			See Trim 5 or 5A
13	Alloy 20	c	19Cr-2PNi	ASTM A351(CN7M)	ASTM B473	AWS A5.9 ER320
14	Alloy 20 and	c	19Cr-2PNi	ASTM A351(CN7M)	ASTM B473	AWS A5.9 ER320
	Hardfaced	350f	Trim 5 or 5A			See Trim 5 or 5A

a : HB is Brinell hardness number symbol per ASTM 10(formerly BHN.)
c : Manufacture's standard hardness.
e : Case hardened by nitriding to thickness of 0.005-inch(0.13mm) minimum.
g : Manufacture's standard with 30 Ni. minimum.
b : Body and gate seats 250 HB minimum, with 50 HB minimum differential between body and gate seats.
d : Differential hardness between body and gate seat surfaces not required.
f : Hardness differential between body and gate seats shall be the manufacture's standard.
h : This classification includes such trademarked materials as Stellite 6, Stoody 6, and Wallex6.

VALVE WALL THICKNESS

STD : ASME B16.34

API 603 / ASME B 16.34 LIGHT WALL

NORMINAL 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

STD : API 600

API 600 HEAVY WALL

NORMINAL 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	-	-

MATERIAL COMPARISONS FOR ASTM & JIS

General Classification		"ASTM" Symbols		"KS" Symbols		Service Temp
		Castings	Forgings	Castings	Forgings	
HIGH TEMPERATURE	Cast Iron	A126 - Class B		G5501 - FC20		250°C
	Cast Iron	A126 - Class C		G5501 - FC25		250°C
	Carbon Steel	A216 - WCA		G5151 - SCPH1		420°C
	Carbon Steel	A216 - WCB	A105	G5151 - SCPH2	G3202 - SFVC 2A	425°C
	½ Mo Steel	A217 - WC1	A182 - F1	G5151 - SCPH11	G3202 - SFVA F1	455°C
	1¼ Cr - Mo	A217 - WC6	A182 - F11	G5151 - SCPH21	G3202 - SFVA F11A	593°C
	1Cr - 1Mo	A217 - WC9	A182 - F22	G5151 - SCPH32	G3202 - SFVA F22A	593°C
	5Cr - Mo	A217 - C5	A182 - F5a	G5151 - SCPH61	G3202 - SFVA F5D	650°C
	9Cr - 1Mo	A217 - C12	A182 - F9		G3202 - SFVA F9	650°C
LOW TEMPERATURE	Al Steel	A352 - LCB, LCC	A350 - LF2	G5121 - SCPL1	G3202 - SFL2	-46°C
	½ Mo Steel	A352 - LC1		G5121 - SCPL11		-59°C
	2½ Ni Steel	A352 - LC2		G5121 - SCPL21		-73°C
	3Ni Steel	A352 - LC3	A350 - LF3	G5121 - SCPL31	G3205 - SFL3	-101°C
STAINLESS STEEL	13Cr - ½Mo	A217 - CA15	A182 - F6a	G5121 - SCS1	G4303 - 410	550°C
	18Cr - 8Ni(C0.03)	A351 - CF3	A182 - F304L	G5121 - SCS19A	G3214 - SUS F304L	800°C
	18Cr - 8Ni(C0.08)	A351 - CF8	A182 - F304	G5121 - SCS13A	G3214 - SUS F304	800°C
	18Cr - 8Ni - 2Mo(C0.03)	A351 - CF3M	A182 - F316L	G5121 - SCS16A	G3214 - SUS F316L	800°C
	18Cr - 8Ni - 2Mo(C0.08)	A351 - CF8M	A182 - F316	G5121 - SCS14A	G3214 - SUS F316	800°C
	18Cr - 8Ni - Ti		A182 - F321		G3214 - SUS F321	800°C
	18Cr - 8Ni - Cb	A351 - CF8C	A182 - F347	G5121 - SCS21	G3214 - SUS F347	800°C
	22Cr - 12Ni	A351 - CH20		G5121 - SCS17		1200°C
	23Cr - 19Ni	A351 - CK20		G5121 - SCS18		1200°C
	19Cr - 27Ni - 2Mo - 3Cu	A351 - CN7M		G5121 - SCS23		1200°C

General Classification	"ASTM" Symbols	"KS" Symbols	Service Temp.
● HIGH - TEMPERATURE(BOLT)			
Mild Steel		G3101 - SS41	260°C
Carbon Steel	A307 - B	G4051 - S25C	204°C
5Cr - ½Mo	A193 - B5	G4107 - SNB5	600°C
1Cr - Mo	A193 - B7	G4107 - SNB7	550°C
Cr - Mo - Va	A193 - B16	G4107 - SNB16	600°C
18Cr - 8Ni	A193 - B8	G4303 - SUS304	800°C
18Cr - 10Ni - Cb	A193 - B8C	G4303 - SUS347	800°C
18Cr - 10Ni - Ti	A193 - B8T	G4303 - SUS321	800°C
18Cr - 12Ni - 2Mo	A193 - B8M	G4303 - SUS316	800°C
15Cr - 25Ni - Mo - Ti - V - B	A453 - 660		540°C

General Classification	"ASTM" Symbols	"KS" Symbols	Service Temp.
● LOW - TEMPERATURE(BOLT)			
Cr - Mo	A320 - L7		-101°C
18Cr - 8Ni	A320 - B8	G4303 - SUS304	-196°C
18Cr - 10Ni - Cb	A320 - B8C	G4303 - SUS347	-196°C
18Cr - 10Ni - Ti	A320 - B8T	G4303 - SUS321	-196°C
18Cr - 12Ni - 2Mo	A320 - B8M	G4303 - SUS316	-196°C
● NUT			
Carbon Steel(C 0.15)		G4051 - S20C	420°C
Carbon Steel(C 0.40)	A194 - 2H	G4051 - S45C	550°C
Carbon Mo Steel	A194 - 4		600°C
18Cr - 8Ni	A194 - 8	G4303 - SUS304	800°C
18Cr - 10Ni - Cb	A194 - 8C	G4303 - SUS347	800°C
18Cr - 10Ni - Ti	A194 - 8T	G4303 - SUS321	800°C
18Cr - 12Ni - 2Mo	A194 - 8M	G4303 - SUS316	800°C

Body Materials	Temperature Degrees F.	Bolts Material Specifications	Nuts
Carbon Steel (Grade WCB)	-20 to 800	ASTM A193 Gr B7	ASTM A194 Gr 2H
Carbon Steel (Grade LCB)	-50 to 650	ASTM A320 Gr L7	ASTM A194 Gr 4
Carbon Moly (Grade WC1)	-20 to 850	ASTM A193 Gr B7	ASTM A194 Gr 2H
1 ¼ - Mo (Grade WC6)	-20 to 1000	ASTM A193 Gr B7	ASTM A194 Gr 2H
2 ¼ - Mo (Grade WC9)	-20 to 1000	ASTM A193 Gr B7	ASTM A194 Gr 2H
	1000 to 1050	ASTM A193 Gr B16	ASTM A194 Gr 4
5 ½ - Mo (Grade C5)	-20 to 1000	ASTM A193 Gr B7	ASTM A194 Gr 2H
	1000 to 1100	ASTM A193 Gr B16	ASTM A194 Gr 4
9 Cr - 1Mo (Grade C12)	-20 to 1000	ASTM A193 Gr B7	ASTM A194 Gr 2H
	1000 to 1100	ASTM A193 Gr B16	ASTM A194 Gr 4
Type 304 (Grade CF8)	-425 to 100	ASTM A320 Gr B8	ASTM A194 Gr 8
	100 to 1500	ASTM A193 Gr B8	ASTM A194 Gr 8
Type 316 (Grade CF8M)	-425 to 100	ASTM A320 Gr B8	ASTM A194 Gr 8
	100 to 1500	ASTM A193 Gr B8M	ASTM A194 Gr 8M
3 ½Ni (Grade LC3)	-150 to -50	ASTM A320 Gr L7 with Charpy Test or 8M	ASTM A194 Gr 4
	-50 to 650	ASTM A320 Gr L7	ASTM A194 Gr 4

CASTING MATERIALS

CHEMICAL PROPERTIES

	Carbon Steel	CA-15	High Temp.	High Temp.	High Temp.	High Temp.	304-S. S.	316-S. S.	HASTESSOY-B	304L-S. S.	316L-S. S.	Low Temp.
ASTM Std.	A-216	A-217	A-217	A-217	A-217	A-217	A-351	A-351	A-494	A-351	A-351	A-352
Grade	WCB	CA-15	WC6	WC9	C-5	C-12	CF8	CF8M	N-12MY	CF3	CF3M	LCB
C% Max.	0.30	0.15	0.20	0.18	0.20	0.20	0.08	0.08	0.12	0.03	0.03	0.03
Mn%	1.00Max	1.00	0.50-0.80	0.40-0.70	0.40-0.70	0.35-0.65	1.50	1.50	1.00	1.50	1.50	1.00
p% Max.	0.04	0.040	0.04	0.04	0.040	0.040	0.04	0.04	0.040	0.04	0.04	0.04
S% Max.	0.045	0.040	0.045	0.045	0.045	0.045	0.04	0.04	0.030	0.04	0.04	0.045
Ni%	0.5	1.00	-	-	-	-	8.00	9.00	Bal	8.00-12.0	9.00-13.0	-
Cr%	0.4	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	17.0-21.0	17.0-21.0	-
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	-	2.00-3.00	-
Cu	0.00	-	-	-	-	-	-	-	-	-	-	-
Si	0.30	1.50	0.60	0.60	0.75	1.00	2.00	2.00	1.00	2.00	1.50	0.60
Fe	-	-	-	-	-	-	-	-	4.0-6.0	-	-	-
V	-	-	-	-	-	-	-	-	0.20-0.60	-	-	-

PHYSICAL PROPERTIES

Tensile Strength Min. Ksi Mpa	70 485	90-115 621-793	70 485	70 485	90-115 621-793	90-115 621-793	70 485	70 485	76 525	70 485	70 485	60 450
Yield Point Min. Ksi Mpa	30 205	65 450	40 275	40 275	60 415	60 415	28 195	30 205	40 275	30 205	30 205	35 240
Elongation in 2 inch (50mm)% Min.	22	15	20	20	18	18	35	30	6	35	30	24
Reduction of Area % Min.	35	30	35	35	35	35	-	-	-	-	-	35

WROUGHT MATERIALS

CHEMICAL PROPERTIES

	11-13% Cr	Ductile	Carbon Steel	B - 8F	321-S.S.	304-S.S.	316-S.S.	304L-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	A-194
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	1.05	0.38-0.48	0.04
Si% Max	1.00	1.00-3.00	0.35	1.00	1.00	1.00	1.00	1.00	1.00	1.11	0.15-0.35	-
Mn% 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	0.250-0.350	0.030	0.03	0.03	0.030	0.030		0.04	0.05
Ni%	0.50	21.0-24.0	-	8.00-10.00	9.00-12.00	8.0-11.0	10.0-14.0	8.00-13.0	10.00-15.00	-	-	-
Cr%	1.5-14.5	0.50	-	17.00-19.00	17.00Min	18.00-20.00	16.0-18.0	18.0-20.0	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%x0.5-0.06	-	-	-	-	-	-	-
Fe%	Bal	-	-	-	-	-	-	-	-	0.30	Bal	Bal
W%	-	-	-	-	-	-	-	-	-	4.20	-	-
Co%	-	-	-	-	-	-	-	-	-	Bal	-	-

PHYSICAL PROPERTIES

Tensile Strength Min. Ksi Mpa	85 585	58 400	70 483	75 517	75 515	75 515	75 515	70 485	70 485	- -	125 862	175 -
Yield Point Min. Ksi Mpa	55 380	28 193	36 248	30 207	30 205	30 205	30 205	25 170	25 170	- -	105 724	- -
Elongation in 2 inch (50mm)% Min.	18	20	22	35	30	30	30	30	30	-	16	-
Reduction of Area % Min.	35	45	30	50	50	50	50	50	50	-	50	-

Dimensions of Butt – Welding Ends

ASME B16.25 - 2004

Nominal Pipe Size	Schedule Number or Wall	Outside Diameter(Cast Steel Valves) A		Nominal Inside Diameter B		Machined Inside Diameter C		Nominal Wall Thickness t	
		inch	mm	inch	mm	inch	mm	inch	mm
2 ½	40	2.96	75	2.469	63	2.479	62.95	0.203	5.15
	80			2.323	59	2.351	59.70	0.276	7.0
	160			2.125	54	2.178	55.30	0.375	9.55
	XXS			1.771	45	1.868	47.45	0.552	14.00
3	40	3.59	91	3.068	78	3.081	78.25	0.216	5.50
	80			2.900	74	2.934	74.50	0.300	7.60
	160			2.624	67	2.692	68.40	0.438	11.15
	XXS			2.300	58	2.409	61.20	0.600	15.25
3 ½	40	4.12	105	3.548	90	3.564	90.55	0.226	5.75
	80			3.364	85	3.402	86.40	0.318	8.10
4	40	4.62	117	4.026	102	4.044	102.70	0.237	6.00
	80			3.826	97	3.869	98.25	0.337	8.55
	120			3.624	92	3.692	93.80	0.438	11.15
	160			3.438	87	3.530	89.65	0.531	13.50
	XXS			3.152	80	3.279	83.30	0.674	17.10
5	40	5.69	144	5.047	128	5.070	128.80	0.258	6.55
	80			4.813	122	4.866	123.60	0.375	9.55
	120			4.563	116	4.967	118.05	0.500	12.70
	160			4.313	110	4.428	112.45	0.625	15.90
	XXS			4.063	103	4.209	106.90	0.750	19.05
6	40	6.78	172	6.065	154	6.094	154.80	0.280	7.10
	80			5.761	146	5.828	148.05	0.432	10.95
	120			5.501	140	5.600	142.25	0.562	14.25
	160			5.187	132	5.326	135.30	0.719	18.25
	XXS			4.897	124	5.072	128.85	0.864	21.95
8	40	8.78	223	7.981	203	8.020	203.70	0.322	8.20
	60			7.813	198	7.873	199.95	0.406	1030
	80			7.625	194	7.709	195.80	0.500	12.70
	100			7.437	189	7.544	191.60	0.594	15.10
	120			7.187	183	7.326	186.10	0.719	18.25
	140			7.001	178	7.163	181.95	0.812	20.60
	XXS			6.875	175	7.053	179.15	0.875	22.25
	160			6.813	173	6.998	177.75	0.906	23.00
10	40	10.94	278	10.020	255	10.070	255.80	0.365	9.25
	60			9.750	248	9.834	249.80	0.500	12.70
	80			9.562	243	9.670	245.60	0.594	15.110
	100			9.312	237	9.451	240.05	0.719	18.25
	120			9.062	230	9.232	234.50	0.844	21.45
	140			8.750	222	8.959	227.55	1.000	25.40
	160			8.500	216	8.740	222.00	1.125	28.60
12	STD	12.97	329	12.000	305	12.053	306.15	0.342	9.55
	40			11.938	303	11.999	304.75	0.406	10.30
	XS			11.750	298	11.834	300.60	0.500	12.70
	60			11.626	295	11.725	297.80	0.562	14.25
	80			11.374	289	11.505	292.25	0.688	17.50
	100			11.062	281	11.232	285.30	0.844	21.45
	120			10.750	273	10.959	278.35	1.000	25.40
	140			10.500	267	10.740	282.80	1.125	28.60
	160			10.126	257	10.413	264.50	1.312	33.30
14	STD	14.25	362	13.250	227	13.303	337.90	0.375	9.55
	40			13.124	333	13.192	335.10	0.438	11.15
	XS			13.000	330	13.084	332.35	0.500	12.70
	60			12.812	325	12.920	328.15	0.594	15.10
	80			12.500	318	12.646	321.20	0.750	19.05
	100			12.124	308	12.318	312.90	0.938	23.85
	120			11.812	300	12.044	305.90	1.094	27.80
	140			11.500	292	11.771	299.00	1.250	31.75
	160			11.188	284	11.498	292.05	1.406	35.70
16	STD	16.25	413	15.250	387	15.303	388.70	0.375	9.55
	40			15.000	381	15.084	383.15	0.500	12.70
	60			14.688	373	14.811	376.20	0.656	16.65
	80			14.312	364	14.482	367.85	0.844	21.45
	100			13.938	354	14.155	359.55	1.031	26.20
	120			13.562	344	13.826	351.20	1.219	30.95
	140			13.124	333	13.422	341.45	1.438	36.55
	160			12.812	325	13.170	334.50	1.594	40.50

Dimensions of Butt – Welding Ends

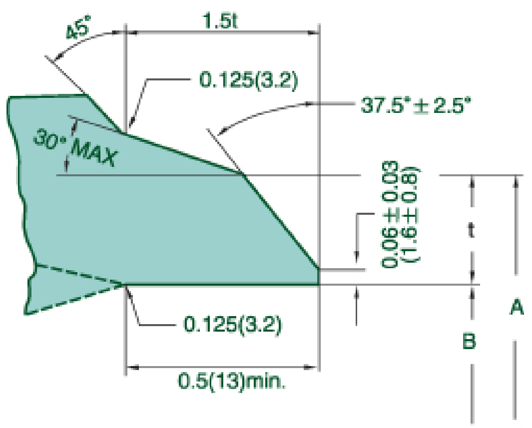
ASME B16.25 - 2004

Nominal Pipe Size	Schedule Number or Wall	Outside Diameter(Cast Steel Valves) A		Nominal Inside Diameter B		Machined Inside Diameter C		Nominal Wall Thickness t	
		inch	mm	inch	mm	inch	mm	inch	mm
18	STD	18.28	464	17.250	438	17.303	439.50	0.375	9.55
	XS			17.000	432	17.084	433.95	0.500	12.70
	40			16.876	429	16.975	431.15	0.562	14.25
	60			16.500	419	16.646	422.80	0.750	19.05
	80			16.124	410	16.318	414.50	0.938	23.85
	100			15.688	398	15.936	404.75	1.156	29.35
	120			15.250	387	15.553	395.05	1.375	34.95
	140			14.876	378	15.225	386.70	1.562	39.65
	160			14.438	367	14.842	377.00	1.781	45.25
20	STD	20.31	516	19.250	489	19.303	490.30	0.375	9.55
	XS			19.000	483	19.084	484.75	0.500	12.70
	40			18.812	478	18.920	480.55	0.594	15.10
	60			18.376	467	18.538	470.85	0.812	20.60
	80			17.938	456	18.155	461.15	1.031	26.20
	100			17.438	443	17.717	150.00	1.281	32.55
	120			17.000	432	17.334	440.30	1.500	38.10
	140			16.500	419	16.896	429.15	1.750	44.45
	160			16.062	408	16.513	419.45	1.969	50.00
22	STD	22.34	567	21.250	540	21.303	541.10	0.375	9.55
	XS			21.000	533	21.084	535.55	0.500	12.70
	60			20.250	514	20.428	518.85	0.875	22.25
	80			19.750	502	19.990	507.75	1.125	28.60
	100			19.250	489	19.553	496.65	1.375	34.95
	120			18.750	476	19.115	485.50	1.625	41.30
	140			18.250	464	18.678	474.40	1.875	47.65
	160			17.750	451	18.240	463.30	2.125	54.00
24	STD	24.38	619	23.250	591	23.303	591.90	0.375	9.55
	XS			23.000	584	23.084	586.35	0.500	12.70
	30			22.846	581	22.975	583.55	0.562	14.25
	40			22.624	575	22.755	578.00	0.688	17.50
	60			22.062	560	22.263	565.50	0.969	24.60
	80			21.562	548	21.826	554.40	1.219	30.95
	100			20.938	532	21.281	540.50	1.531	38.90
	120			20.376	518	20.788	528.00	1.812	46.00
	140			19.846	505	20.350	516.90	2.062	52.35
	160			19.312	491	19.857	504.35	2.344	59.55
26	10	26.38	670	25.376	645	25.413	645.50	0.312	7.90
	20			25.000	635	25.084	637.15	0.500	12.70
28	10	28.38	721	27.376	695	27.413	696.30	0.312	7.90
	20			27.000	686	27.084	687.95	0.500	12.70
	30			26.750	679	26.865	682.35	0.625	15.90
30	10	30.38	772	29.376	746	29.413	747.10	0.312	7.90
	20			29.000	737	29.084	738.75	0.500	12.70
	30			28.750	730	28.865	733.15	0.625	15.90
32	10	32.50	825	31.376	797	31.413	797.90	0.312	7.90
	20			31.000	787	31.084	789.55	0.500	12.70
	30			30.750	781	30.865	783.95	0.625	15.90
	40			30.624	778	30.755	781.20	0.688	17.50
34	10	34.50	876	33.376	848	33.413	848.70	0.312	7.90
	20			33.000	838	33.084	840.35	0.500	12.70
	30			32.750	832	32.865	833.75	0.625	15.90
	40			32.624	829	32.755	832.00	0.688	17.50
36	10	36.50	927	35.376	899	35.413	899.50	0.312	7.90
	20			35.000	889	35.084	891.15	0.500	12.70
	30			34.750	883	34.865	885.55	0.625	15.90
	40			34.500	876	34.646	880.00	0.750	19.05

NOTES **STD** - standard wall thickness / **XS** - extra - strong wall thickness / **XSS** - double extra - strong wall thickness

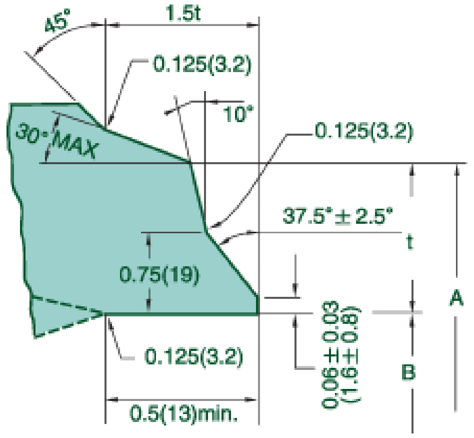
Standard Preparation of Valve Butt

TYPE A



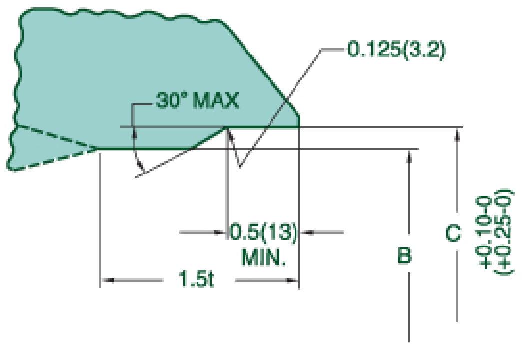
For Wall Thickness(t) 0.188(4.8) tp 0.875(22.2) Inclusive

TYPE B



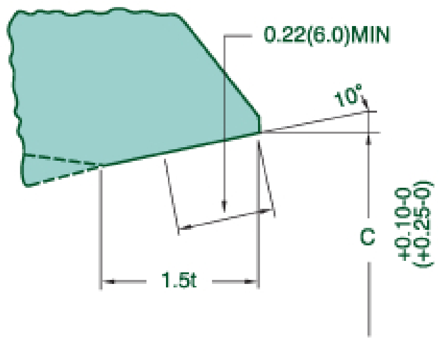
For Wall Thickness(t) 0.Greater Than 0.875(22.2)

TYPE C



Inside Contour for Use with Rectangular Backing Ring

TYPE D



Inside Contour for Use with Taper Backing Ring

FORMULA

Dimension C for the bore of pipe, valve, welding neck flanges and pipe fittings when using continuous rectangular of taper backing rings is determined by the following formula:

C = A -0.031(0.787) - 1.75t -0.010(0.254)

where

A = Nominal outside dimeter of pipe

0.031(0.785) = Minus tolerance on OD of pipe (AS covered by ASTM Specification having the more restrictive requirements such as A106, A335, etc.)

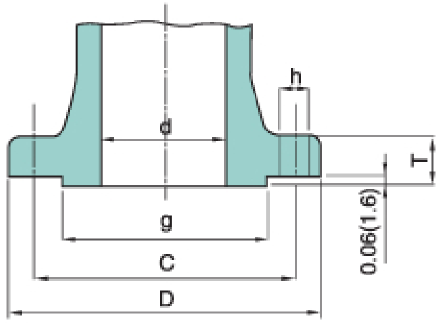
1.75 = Minimum wall of 87 percent of nominal wall (permitted by ASTM specification having the more restrictive requirements such as A106, A335, etc.) multiplied by two to convert into terms of diameter.

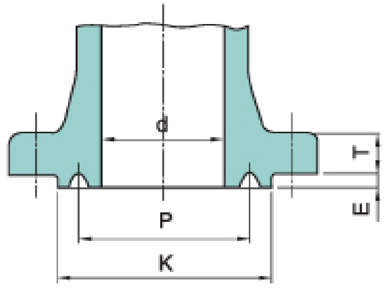
t = Nominal wall thickness of pipe in inches

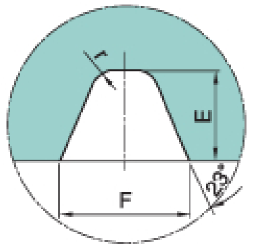
0.010(0.254) = Plus machining tolerance of Bore C.

Linear dimensions are in inches with metric valves shown in millimeters in parenthesis.

Dimensions of Class 150 Steel Flange Valves and Fittings







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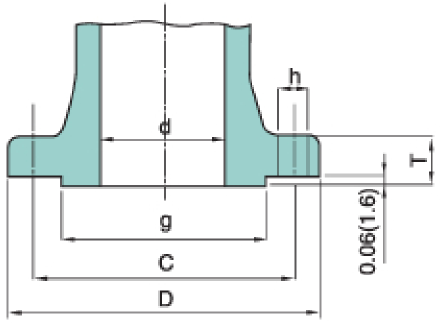
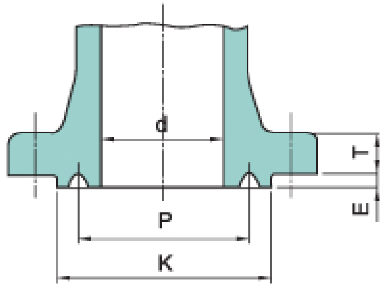
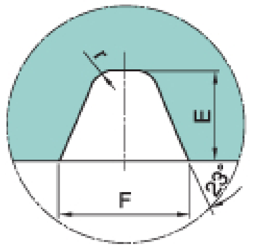
Nominal Pipe Size	Inside Diam	OD of Flange	Raised Face Diam.	Thickness of Flange		Diam. of Bolt Circle	Diam. of Bolt Holes	No. of Bolt	Diam. of Bolt	Facing Diam.	Pitch Diam.	Ring No.	Depth Groove	Width Groove	Groove Fillet Radius
	d	D	g	T		T	T			K	P		K	F	F
Inch mm	Inch mm	Inch mm	Inch mm	Inch mm		Inch mm	Inch mm			Inch mm	Inch mm		Inch mm	Inch mm	Inch mm
1/2	0.50	3.50	1.38	-	0.44	2.38	0.62	4	1/2	-	-	-	-	-	-
15	12.7	88.9	35.1	-	11.2	60.5	15.8			-	-		-	-	-
3/4	0.75	3.88	1.69	-	0.50	2.75	0.62	4	1/2	-	-	-	-	-	-
20	19.1	98.6	42.9	-	12.7	69.9	15.8			-	-		-	-	-
1	1.00	4.25	2.00	0.44	0.56	3.1	0.62	4	1/2	2.50	1.875	R15	0.25	0.344	0.03
25	25.4	108	50.8	11.3	14.3	79.3	15.8			63.5	47.63		6.35	8.75	0.8
1	1.25	4.62	2.50	0.50	0.62	3.50	0.62	4	1/2	2.88	2.250	R17	0.25	0.344	0.03
32	32.8	117.4	63.5	13.0	15.8	88.9	15.8			73.2	57.15		6.35	8.75	0.8
1	1.50	5.00	2.88	0.52	0.69	3.88	0.62	4	1/2	3.25	2.562	R19	0.25	0.344	0.03
40	38.1	127	73.2	14.52	17.5	98.6	15.8			82.6	65.08		6.35	8.75	0.8
2	2.00	6.00	3.62	0.62	0.75	4.75	0.84	4	5/8	4.00	3.250	R22	0.25	0.344	0.03
50	50.8	152.4	92.0	15.58	19.1	12.7	19.1			101.6	82.55		6.35	8.75	0.8
2	2.50	7.00	4.12	0.69	0.88	5.50	0.75	4	5/8	4.75	4.00	R25	0.25	0.344	0.03
65	63.5	177.8	104.7	17.5	22.4	139.7	19.1			120.7	101.60		6.35	8.75	0.8
3	3.00	7.50	5.00	0.75	0.94	6.00	1.75	4	5/8	5.25	4.50	R29	0.25	0.344	0.03
80	76.2	190.5	127.0	19.1	23.9	152.4	19.1			133.4	144.3		6.35	8.75	0.8
3	3.50	8.50	5.50	0.8	0.94	7.00	0.75	4	5/8	6.06	5.188	R33	0.25	0.344	0.03
90	88.9	215.9	139.7	20.30	23.9	177.8	19.1			153.9	131.78		6.35	8.75	0.8
4	4.00	9.00	6.19	0.94		7.50	0.75	8	5/8	6.75	5.875	R36	0.25	0.344	0.03
100	101.6	228.6	157.2	23.9		190.5	19.1			171.5	149.23		6.35	8.75	0.8
5	5.00	10.000	7.31	0.94		8.50	0.88	8	3/4	7.62	6.750	R40	0.25	0.344	0.03
125	127	254.0	185.7	23.9		215.9	22.4			193.6	171.45		6.35	8.75	0.8
6	6.00	11.00	8.50	1.00		9.50	0.88	8	3/4	8.62	7.625	R43	0.25	0.344	0.03
150	152.4	279.4	215.9	25.5		241.3	22.4			219.0	193.68		6.35	8.75	0.8
8	8.00	13.50	10.62	1.12		11.75	0.88	8	7/8	10.75	9.750	R48	0.25	0.344	0.03
200	203.2	342.9	269.8	28.5		298.5	22.4			273.1	247.65		6.35	8.75	0.8
10	10.00	16.00	12.75	1.19		14.25	1.00	12	7/8	13.00	12.000	R52	0.25	0.344	0.03
250	254	406.4	323.9	30.2		362.0	25.4			330.2	304.80		6.35	8.75	0.8
12	12.00	19.00	15.00	1.25		17.00	1.00	12	7/8	16.00	15.000	R56	0.25	0.344	0.03
300	304.8	482.6	381.0	31.8		431.8	25.4			406.4	381.00		6.35	8.75	0.8
14	13.25	21.00	16.25	1.38		18.75	1.12	12	1	16.75	15.625	R59	0.25	0.344	0.03
350	336.6	533.4	412.8	35.1		476.3	28.5			425.5	396.88		6.35	8.75	0.8
16	15.25	23.50	18.50	1.44		21.25	1.12	16	1	19.00	17.875	R64	0.25	0.344	0.03
400	387.4	596.9	469.9	36.6		539.8	28.5			482.6	454.03		6.35	8.75	0.8
18	17.25	25.00	21.00	1.56		22.75	1.25	16	1 1/8	21.50	20.375	R68	0.25	0.344	0.03
450	438.2	635	533.4	39.6		577.9	31.8			546.1	517.53		6.35	8.75	0.8
20	19.25	27.50	23.00	1.69		25.00	1.25	20	1 1/8	23.50	22.000	R72	0.25	0.344	0.03
500	489.0	698.7	584.2	42.9		635.0	31.8			596.9	558.80		6.35	8.75	0.8
24	23.25	32.00	27.25	1.88		29.50	1.38	20	1 1/4	28.00	26.500	R76	0.25	0.344	0.03
600	590.6	812.8	692.2	47.8		749.3	35.1			711.2	673.10		6.35	8.75	0.8

1.... Sizes 3 and smaller slightly heavier than for fittings which are reinforced by being cast integral with the body of the fitting.

Dimensions of Class 300 Steel Flange Valves and Fittings



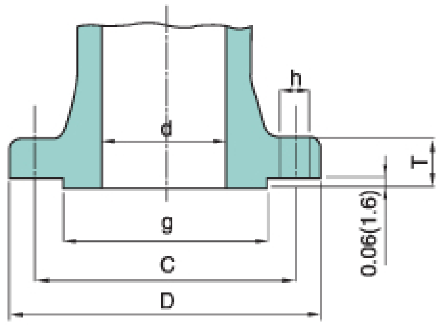


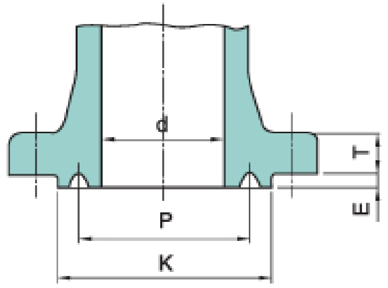


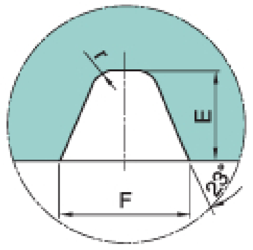
ANSI B16.5 - 2004

Nominal Pipe Size	Inside Diam	OD of Flange	Raised Face Diam.	Thickness of Flange	Diam. of Bolt Circle	Diam. of Bolt Holes	No. of Bolt	Diam. of Bolt	Facing Diam.	Pitch Diam.	Ring No.	Depth Groove	Width Groove	Groove Fillet Radius
	d	D	g	T	T	T			K	P		K	F	F
Inch mm	Inch mm	Inch mm	Inch mm	Inch mm	Inch mm	Inch mm			Inch mm	Inch mm		Inch mm	Inch mm	Inch mm
1/2	0.50	3.75	1.38	0.56	2.62	0.62	4	1/2	2.00	1.344	R11	0.219	0.281	0.03
15	12.7	95.3	35.1	1.42	66.6	15.8			50.8	34.14		5.56	7.14	0.8
3/4	0.75	4.62	1.69	0.62	3.25	0.75	4	5/8	2.50	1.688	R13	0.250	0.344	0.03
20	19.1	117.3	42.9	15.8	82.6	19.1			63.5	42.88		6.35	8.75	0.8
1	1.00	4.88	2.00	0.69	3.50	0.75	4	5/8	2.75	2.000	R16	0.750	0.344	0.03
25	25.4	124	50.8	17.5	88.9	19.1			69.9	50.80		6.35	8.75	0.8
1	1.25	5.25	2.50	0.75	3.88	0.75	4	5/8	3.12	2.375	R18	0.250	0.344	0.03
32	32.8	133.4	63.5	19.1	98.6	19.1			79.3	60.33		6.35	8.75	0.8
1	1.50	6.12	2.88	0.81	4.50	0.88	4	3/4	3.56	2.688	R20	0.250	0.344	0.03
40	38.1	155.5	73.2	20.6	114.3	22.4			90.5	68.28		6.35	8.75	0.8
2	2.00	6.50	3.62	0.88	5.00	0.75	8	5/8	4.25	3.250	R23	0.312	0.469	0.03
50	50.8	165.1	92.0	22.4	127.0	19.1			108	82.55		7.92	11.91	0.8
2	2.50	7.50	4.12	1.00	5.88	0.88	8	3/4	5.00	4.000	R26	0.321	0.469	0.03
65	63.5	190.5	104.7	25.4	149.4	22.4			127	101.60		7.92	11.91	0.8
3	3.00	8.25	5.00	1.12	6.62	0.88	8	3/4	5.75	4.875	R31	0.321	0.469	0.03
80	76.2	209.6	127.0	28.5	168.2	22.4			146.1	123.83		7.92	11.91	0.8
3	3.50	9.00	5.50	1.19	7.25	0.88	8	3/4	6.25	5.188	R34	0.312	0.469	0.03
90	88.9	228.6	139.7	30.2	184.2	22.4			158.8	131.76		7.92	11.91	0.8
4	4.00	10.00	6.19	1.25	7.88	0.88	8	3/4	6.88	5.875	R37	0.312	0.469	0.03
100	101.6	254	157.2	31.8	200.2	22.4			174.8	149.23		7.92	11.91	0.8
5	5.00	11.00	7.31	1.38	9.25	0.88	8	3/4	8.25	7.125	R41	0.312	0.469	0.03
125	127	279.4	185.7	35.1	235.0	22.4			209.6	18.098		7.92	11.91	0.8
6	6.00	12.50	8.50	1.44	10.62	0.88	12	3/4	9.50	8.312	R45	0.312	0.469	0.03
150	152.4	317.5	215.9	36.6	269.8	22.4			241.3	211.13		7.92	11.91	0.8
8	8.00	15.00	10.62	1.62	13.00	1.00	12	7/8	1.88	10.625	R49	0.312	0.469	0.03
200	203.2	381	269.8	41.2	330.2	25.4			301.8	269.88		7.92	11.91	0.8
10	10.00	174.50	12.75	1.88	15.25	1.12	16	1	14.00	12.750	R53	0.312	0.469	0.03
250	254	444.5	323.9	47.8	387.4	28.5			355.6	323.85		7.92	11.91	0.8
12	12.00	20.50	15.00	2.00	17.75	1.25	16	1 1/8	16.25	15.000	R57	0.312	0.469	0.03
300	304.8	521	381.0	50.8	450.9	31.8			412.8	381.00		7.92	11.91	0.8
14	13.25	23.00	16.25	2.12	20.25	1.25	20	1 1/8	18.00	16.500	R61	0.312	0.469	0.03
350	336.6	584.2	412.8	53.8	514.4	31.8			457.2	419.10		7.92	11.91	0.8
16	15.25	25.50	18.50	2.25	22.50	1.38	20	1 1/4	20.00	18.500	R65	0.312	0.469	0.03
400	387	647.7	469.9	57.2	571.5	35.1			508	469.90		7.92	11.91	0.8
18	17.00	28.00	21.00	2.38	24.75	1.38	24	1 1/4	22.62	21.000	R69	0.312	0.469	0.03
450	432	711.2	533.4	60.5	628.7	35.1			574.5	533.40		7.92	11.91	0.8
20	19.00	30.50	23.00	2.50	27.00	1.38	24	1 1/4	25.00	23.000	R73	0.375	0.531	0.06
500	483	774.7	584.2	63.5	685.8	35.1			635	584.20		9.52	13.49	1.5
24	23.00	36.00	27.25	2.75	32.00	1.62	24	1 1/2	29.50	27.250	R77	0.438	0.656	0.06
600	584	914.4	692.2	69.9	812.8	41.2			749.3	692.15		11.13	16.66	1.5

Dimensions of Class 600 Steel Flange Valves and Fittings







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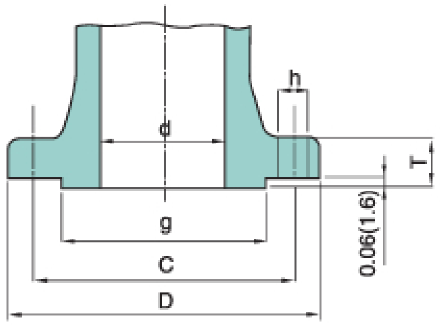
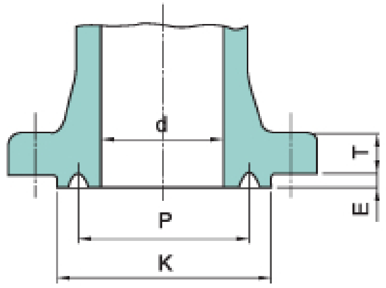
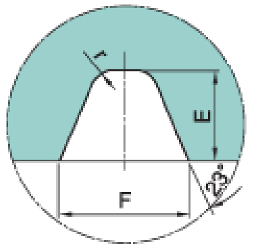
Nominal Pipe Size	Inside Diam	OD of Flange	Raised Face Diam.	Thickness of Flange	Diam. of Bolt Circle	Diam. of Bolt Holes	No. of Bolt	Diam. of Bolt	Facing Diam.	Pitch Diam.	Ring No.	Depth Groove	Width Groove	Groove Fillet Radius
	d	D	g	T	T	T			K	P		K	F	F
inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm			inch mm	inch mm		inch mm	inch mm	inch mm
1/2 15	0.5 12.7	3.75 95.3	1.38 35.1	0.56 14.2	2.62 66.6	0.62 15.8	4	1/2	2 50.8	1.344 34.14	R11	0.219 5.56	0.281 7.14	0.03 0.8
3/4 20	0.75 19.1	4.62 117.4	1.69 42.9	0.62 15.8	3.25 82.6	0.75 19.1	4	5/8	2.5 63.5	1.688 42.88	R13	0.25 6.35	0.344 8.74	0.03 0.8
1 25	1 25.4	4.88 124	2 50.8	0.69 17.5	3.5 88.9	0.75 19.1	4	5/8	2.75 69.9	2 50.8	R16	0.25 6.35	0.344 8.74	0.03 0.8
1 32	1.25 32.8	5.25 133.4	2.5 63.5	0.81 20.6	3.88 98.6	0.75 19.1	4	5/8	3.12 79.3	2.375 60.33	R18	0.25 6.35	0.344 8.74	0.03 0.8
1 40	1.5 38.1	6.12 155.5	2.88 73.2	0.88 22.4	4.5 114.3	0.88 22.4	4	3/4	3.56 90.4	2.688 68.28	R20	0.25 6.35	0.344 8.74	0.03 0.8
2 50	2 50.8	6.5 165.1	3.62 92	1 25.4	5 127	0.75 19.1	8	85/8	4.25 108	3.25 82.55	R23	0.312 7.92	0.469 11.91	0.03 0.8
2 65	2.5 63.5	7.5 190.5	4.12 104.7	1.12 28.5	5.88 149.4	0.88 22.4	8	3/4	5 127	4 101.6	R26	0.312 7.92	0.469 11.91	0.03 0.8
3 80	3 76.2	8.25 209.6	5 127	1.25 321.8	6.62 168.2	0.88 22.4	8	3/4	5.75 146.1	4.875 123.83	R31	0.312 7.92	0.469 11.91	0.03 0.8
3 90	3.5 88.9	9 228.6	5.5 139.7	1.38 35.1	7.25 184.1	1 25.4	8	7/8	6.25 158.8	5.188 131.86	R34	0.312 7.92	0.469 11.91	0.03 0.8
4 100	4 101.6	10.75 273.1	6.19 157.2	1.5 38.1	8.5 215.9	1 25.4	8	7/8	6.88 174.8	5.875 149.23	R37	0.312 7.92	0.469 11.91	0.03 0.8
5 125	5 127	13 330.2	7.31 185.7	1.75 44.5	10.5 266.7	1.12 28.4	8	1	8.25 209.6	7.125 180.98	R41	0.312 7.92	0.469 11.91	0.03 0.8
6 150	6 152.4	14 355.6	8.5 215.9	1.88 47.8	11.5 292.1	1.12 28.4	12	1	9.5 241.3	8.312 211.13	R45	0.312 7.92	0.469 11.91	0.03 0.8
8 200	7.87 199.9	16.5 419.1	10.62 269.8	2.16 55.6	13.75 349.3	1.25 31.8	12	1 1/8	11.88 301.8	10.625 269.88	R49	0.312 7.92	0.469 11.91	0.03 0.8
10 250	9.75 247.7	20 508	12.75 323.9	2.5 63.5	17 431.8	1.38 31.8	16	1 1/4	14 355.6	12.75 323.85	R53	0.312 7.92	0.469 11.91	0.03 0.8
12 300	11.75 298.5	22 558.8	15 381	2.62 66.5	19.25 489	1.38 31.8	20	1 1/4	16.25 412.8	15 381	R57	0.312 7.92	0.469 11.91	0.03 0.8
14 350	12.87 326.9	23.75 603.3	16.25 412.8	2.75 69.9	20.75 527.1	1.5 38.1	20	1 3/8	18 457.2	16.5 419.1	R61	0.312 7.92	0.469 11.91	0.03 0.8
16 400	14.75 374.7	27 685.8	18.5 469.9	3 76.2	23.75 603.3	1.62 41.1	20	1 1/2	20 508	18.5 469.9	R65	0.312 7.92	0.469 11.91	0.03 0.8
18 450	16.5 419.1	29.25 743	21 533.4	3.25 82.6	25.75 654	1.75 44.5	20	1 5/8	22.62 574.5	21 533.4	R69	0.312 7.92	0.469 11.91	0.03 0.8
20 500	18.25 463.6	32 812.8	23 584.2	3.5 88.9	28.5 723.9	1.75 44.5	24	1 5/8	25 635	23 584.2	R73	0.375 9.52	0.531 13.49	0.06 1.5
24 600	22 558.8	37 939.8	27.25 692.2	4 101.6	33 838.2	2 50.8	24	1 7/8	29.5 749.3	27.25 692.15	R77	0.438 11.13	0.656 16.66	0.06 1.5

Dimensions of Class 900 Steel Flange Valves and Fittings



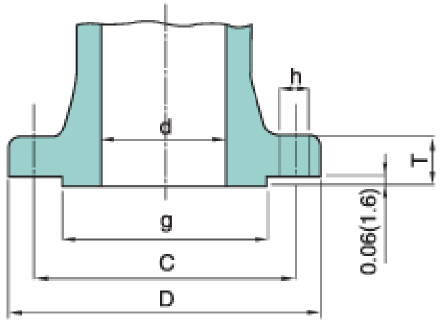


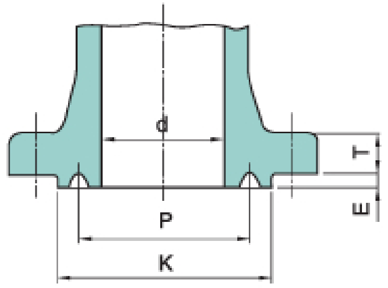


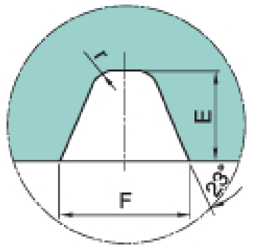
ANSI B16.5 - 2004

Nominal Pipe Size	Inside Diam	OD of Flange	Raised Face Diam.	Thickness of Flange	Diam. of Bolt Circle	Diam. of Bolt Holes	No. of Bolt	Diam. of Bolt	Facing Diam.	Pitch Diam.	Ring No.	Depth Groove	Width Groove	Groove Fillet Radius
	d	D	g	T	T	T			K	P		K	F	F
inch mm	inch mm	inch mm	inch mm	inch mm	inch mm	inch mm			inch mm	inch mm		inch mm	inch mm	inch mm
1/2 15	Use Class 1500 dimensions in these size.													
3/4 20														
1 25														
1 32														
1 40														
2 50														
2 65														
3 80	2.87 72.9	9.5 241.3	5 127	1.5 38.1	7.5 190.5	1 25.4	8	7/8	6.12 155.5	4.875 123.83	R31	0.312 7.92	0.469 11.91	0.03 0.8
4 100	3.87 98.3	11.5 292.1	6.19 157.2	1.75 44.5	9.25 235	1.25 31.8	8	1 1/8	7.12 180.9	5.875 149.23	R37	0.312 7.92	0.469 11.91	0.03 0.8
5 125	4.75 120.7	13.75 349.3	7.31 185.7	2 50.8	11 279.4	1.38 35.1	8	1 1/4	8.5 215.9	7.125 180.98	R41	0.312 7.92	0.469 11.91	0.03 0.8
6 150	5.75 146.1	15 381	8.5 215.9	2.19 55.7	12.5 317.5	1.25 31.8	12	1 1/8	9.5 241.3	8.312 211.12	R45	0.312 7.92	0.469 11.91	0.03 0.8
8 200	7.50 190.5	18.5 469.9	10.62 269.8	2.5 63.5	15.5 393.7	1.5 38.1	12	1 3/8	12.12 307.9	10.625 269.88	R49	0.312 7.92	0.469 11.91	0.03 0.8
10 250	9.37 238	21.5 546.1	12.75 323.9	2.75 69.9	18.5 469.9	1.5 38.1	16	1 3/8	14.25 362	12.75 323.85	R53	0.312 7.92	0.469 11.91	0.03 0.8
12 300	11.12 282.5	24 609.6	15 381	3.12 79.3	21 533.4	1.5 38.1	20	1 3/8	16.5 419.1	15 381	R57	0.312 7.92	0.469 11.91	0.03 0.8
14 350	12.25 311.2	25.25 641.4	16.25 412.8	3.38 85.9	22 558.8	1.62 41.2	20	1 1/2	18.38 466.9	16.5 419.1	R62	0.438 11.13	0.656 16.66	0.06 1.5
16 400	14 355.6	27.75 704.9	18.5 469.9	3.35 88.9	24.25 616	1.75 44.5	20	1 5/8	20.62 523.8	18.5 469.9	R66	0.438 11.13	0.751 19.84	0.06 1.5
18 450	15.75 400.1	31 787.4	21 533.4	4 101.6	27 685.8	2 50.8	20	1 7/8	23.38 593.9	21 533.4	R70	0.5 12.7	0.781 19.84	0.06 1.5
20 500	17.5 444.5	33.75 857.3	23 584.2	4.25 108	29.5 749.3	2.12 53.9	20	2	25.5 647.7	23 584.2	R74	0.5 12.7	0.781 19.84	0.06 1.5
24 600	21 533.4	41 1041.4	27.25 692.2	5.5 139.7	35.5 901.7	2.62 66.5	20	2 1/2	30.38 771.7	27.25 692.15	R78	0.625 15.88	1.062 26.97	0.09 2.4

Dimensions of Class 1500 Steel Flange Valves and Fittings







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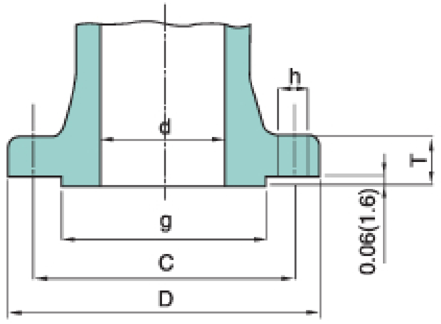
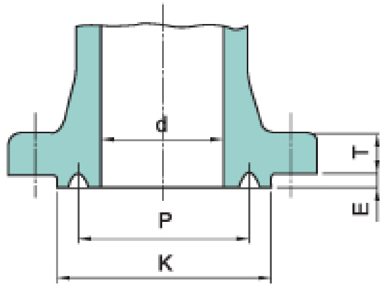
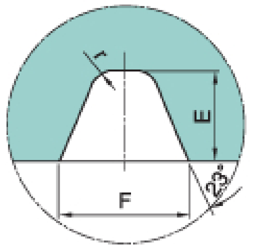
Nominal Pipe Size	Inside Diam	OD of Flange	Raised Face Diam.	Thickness of Flange	Diam. of Bolt Circle	Diam. of Bolt Holes	No. of Bolt	Diam. of Bolt	Facing Diam.	Pitch Diam.	Ring No.	Depth Groove	Width Groove	Groove Fillet Radius
	d	D	g	T	T	T			K	P		K	F	F
Inch mm	Inch mm	Inch mm	Inch mm	Inch mm	Inch mm	Inch mm			Inch mm	Inch mm		Inch mm	Inch mm	Inch mm
1/2	0.50	4.75	1.38	0.88	3.25	0.88	4	3/4	2.38	1.562	R12	0.25	0.344	0.03
15	12.7	120.7	35.1	22.4	82.6	22.4			60.5	39.68		6.35	8.74	0.8
3/4	0.69	5.12	1.69	1	3.5	0.88	4	3/7	2.62	1.75	R14	0.25	0.344	0.03
20	17.5	130	429	25.4	88.9	22.4			66.6	44.45		6.35	8.74	0.8
1	0.88	5.88	2	1.12	4	1	4	7/8	2.81	2	R16	0.25	0.344	0.03
25	22.4	149.4	50.8	28.5	101.6	25.4			71.4	50.8		6.35	8.74	0.8
1	1.12	6.25	2.5	1.12	4.38	1	4	7/8	3.19	2.375	R18	0.25	0.344	0.03
32	28.5	158.8	63.5	28.5	111.3	25.4			81	60.33		6.35	8.74	0.8
1	1.38	7	2.88	1.25	4.88	1.12	4	1	3.62	2.688	R20	0.25	0.344	0.03
40	35.1	177.8	73.2	31.8	124	28.4			92	68.28		6.35	8.74	0.8
2	1.88	8.5	3.62	1.5	6.5	1	8	7/8	4.88	3.75	R24	0.312	0.469	0.03
50	47.8	215.9	92	38.1	165.1	25.4			124	95.25		7.92	11.91	0.8
2 1/2	2.25	9.62	4.12	1.62	7.5	1.12	8	1	5.38	4.25	R27	0.312	0.469	0.03
65	57	244.4	104.7	41.2	190.5	28.5			136.7	107.95		7.92	11.91	0.8
3	2.75	10.5	5	1.88	8	1.25	8	1 1/8	6.62	5.375	R35	0.312	0.469	0.03
80	70	266.7	127	47.8	203.2	31.8			168.2	136.53		7.92	11.91	0.8
4	3.62	12.25	6.19	2.12	9.5	1.38	8	1 1/4	7.62	6.375	R39	0.312	0.469	0.03
100	92	311.2	157.2	53.9	241.3	35.1			193.6	161.93		7.92	11.91	0.8
5	4.37	14.75	7.31	2.88	11.5	1.62	12	1 1/2	9	7.625	R44	0.312	0.469	0.03
125	111	374.7	185.7	73.2	292.1	41.1			228.6	193.68		7.92	11.91	0.8
6	5.37	15.5	8.5	3.25	12.5	1.5	8	1 3/8	9.75	8.312	R46	0.375	0.531	0.06
150	137	393.7	215.9	82.6	317.5	38.1			247.7	211.12		9.52	13.49	1.5
8	7	19	10.62	3.62	15.5	1.75	12	1 5/8	12.5	10.625	R50	0.438	0.656	0.06
200	178	482.6	269.8	92	393.7	44.5			317.5	269.88		11.13	16.66	1.5
10	8.75	23	12.75	4.25	19	2	12	1 7/8	14.62	12.75	R54	0.438	0.656	0.06
250	222	584.2	323.9	108	482.6	50.8			371.4	323.85		11.13	16.66	1.5
12	10.37	26.5	15	4.88	22.5	2.12	16	2	17.25	15	R58	0.562	0.906	0.06
300	264	673.1	381	124	571.5	53.9			438.2	381		14.27	23.01	1.5
14	11.37	29.5	16.25	5.25	25	2.38	16	2 1/4	19.25	16.5	R63	0.625	1.062	0.09
350	289	749.3	412.8	133.4	635	60.5			489	419.1		15.88	26.97	2.3
16	13	32.5	18.5	5.75	27.75	2.62	16	2 1/2	21.5	18.5	R67	0.688	1.188	0.09
400	330	825.5	469.9	146.1	704.9	66.6			546.1	169.9		17.48	30.18	2.3
18	14.62	36	21	6.38	30.5	2.88	16	2 5/4	24.12	21	R71	0.688	1.188	0.09
450	371	914.4	533.4	162.1	774.7	73.2			612.7	533.4		17.48	30.18	2.3
20	16.37	38.75	23	7	32.75	3.12	16	1 5/3	26.5	23	R75	0.688	1.312	0.09
500	416	984.3	584.2	177.8	831.9	79.3			673.1	584.2		17.48	33.32	2.3
24	19.62	46	27.25	8.00	39	3.62	16	3 1/2	31.25	27.25	R79	0.812	1.438	0.09
600	498	1168.4	692.2	203.2	990.6	92			793.8	692.15		20.62	36.53	2.3

Dimensions of Class 2500 Steel Flange Valves and Fittings







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Nominal Pipe Size	Inside Diam	OD of Flange	Raised Face Diam.	Thickness of Flange	Diam. of Bolt Circle	Diam. of Bolt Holes	No. of Bolt	Diam. of Bolt	Facing Diam.	Pitch Diam.	Ring No.	Depth Groove	Width Groove	Groove Fillet Radius
	d	D	g	T	T	T			K	P		K	F	F
Inch mm	Inch mm	Inch mm	Inch mm	Inch mm	Inch mm	Inch mm			Inch mm	Inch mm		Inch mm	Inch mm	Inch mm
1/2	0.44	5.25	1.39	1.19	3.50	0.88	4	3/4	2.56	1.688	R13	0.25	0.344	0.03
15	11.2	133.4	35.3	30.2	88.9	22.4			65	42.88		6.35	8.74	0.8
3/4	0.56	5.50	1.39	1.25	3.75	0.88	4	3/4	2.88	2	R16	0.25	0.344	0.03
20	14.2	139.7	42.9	31.8	95.3	22.4			73.2	50.8		6.35	8.74	0.8
1	0.75	6.25	2.00	1.38	4.25	1.00	4	7/8	3.25	2.375	R18	0.25	0.344	0.03
25	19.1	158.8	50.8	35.1	108.0	25.4			82.6	60.33		6.35	8.74	08
1 1/4	1.00	7.25	2.50	1.50	5.12	1.12	4	1	4	2.844	R21	0.312	0.469	0.03
32	25.4	184.2	63.5	38.1	130.1	28.5			101.6	72.24		7.92	11.91	08
1 1/4	1.12	8.00	2.88	1.75	5.75	1.25	4	1 1/8	4.5	3.25	R23	0.312	0.469	0.03
40	28.5	203.2	73.2	44.5	146.1	31.8			114.3	82.55		7.92	11.91	08
2	1.50	9.25	3.62	2.00	6.75	1.12	8	1	5.25	4	R26	0.312	0.469	0.03
50	38.1	235.0	92.0	508	171.5	28.5			133.4	101.6		7.92	11.91	08
2 1/2	1.88	10.50	4.12	2.25	7.75	1.25	8	1 1/8	5.88	4.375	R28	0.375	0.531	0.06
65	47.8	266.7	104.7	57.2	196.9	31.8			149.4	111.13		9.52	13.49	1.5
3	2.25	12.00	5.00	2.62	9.00	1.38	8	1 1/4	6.62	5	R32	0.375	0.531	0.06
80	57.2	304.8	127.0	66.6	228.6	35.1			168.2	127		9.52	13.49	1.5
4	2.88	14.00	6.19	3.00	10.75	1.62	8	1 1/2	8	6.188	R38	0.438	0.656	0.06
100	73.2	355.6	157.2	76.2	273.1	41.2			203.2	157.17		11.13	16.66	1.5
5	3.62	16.50	7.31	3.62	12.75	1.88	8	1 3/4	9.5	7.5	R42	0.5	0.781	0.06
125	92.0	419.1	185.7	92.0	323.9	47.8			241.3	190.5		12.7	19.84	1.5
6	4.38	19.00	8.50	4.25	14.5	2.12	8	2	11	9	R47	0.5	0.781	0.06
150	111.3	482.6	215.9	108	368.3	53.9			279.4	228.6		12.7	19.84	1.5
8	5.75	21.75	10.62	5.00	17.25	2.12	12	2	13.38	11	R51	0.562	0.906	0.06
200	146.1	552.5	269.8	127.0	438.2	53.9			339.9	279.4		14.27	23.01	1.5
10	7.25	26.50	12.75	6.50	21.25	2.62	12	2 1/2	16.75	13.5	R55	0.688	1.188	0.09
250	184.2	673.1	323.9	165.1	539.7	66.6			425.5	342.9		17.48	30.18	2.4
12	8.62	30.00	15.00	7.25	24.38	2.88	12	2 3/4	19.5	16	R60	0.688	1.312	0.09
300	219.0	762.0	381.0	184.2	619.3	73.2			495.3	406.4		17.48	33.32	2.4

HYDROSTAIC TEST PRESSURE TO ASME

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Material			Test Pressure by Classes																							
Group No.	Forging	Casting	150				300				600				900				1500				2500			
			Shell		Seat / Backseat		Shell		Seat / Backseat		Shell		Seat / Backseat		Shell		Seat / Backseat		Shell		Seat / Backseat		Shell		Seat / Backseat	
			kg/㎠	psi	kg/㎠	psi	kg/㎠	psi	kg/㎠	psi	kg/㎠	psi	kg/㎠	psi	kg/㎠	psi	kg/㎠	psi	kg/㎠	psi	kg/㎠	psi	kg/㎠	psi	kg/㎠	psi
1.1	A105 A350-LF2	A216-WCB	31.8	452.5	21.6	313.5	79.8	1135	57.2	814	157.8	2245	114.5	1628	235.9	3355	171.7	2442	392.5	5582	286.5	4075.5	652.5	9280	477.2	6787
1.2	A350-LF3	A216-WCC A352-LCC A352-LC3	32.3	460	22.4	319	80.6	1150	58	825	160	2275	116	1650	239.1	3400	174	2475	397.2	5650	290	4125	660.9	940	483.4	6875
1.3		A352-LCB	29.7	422.5	20.5	291.5	75.1	1067.5	53.8	764.5	148.4	2110	107.5	1529	221.7	3152.5	161.3	229.3	367.7	5230	268.4	3817	611.9	8702.5	447.4	6363.5
1.4	A350-LF1		26.5	377.5	18.2	258.5	67.1	955	48	682	132	1877.5	95.5	1358.5	196.8	2800	143.1	2035	327.1	4652	238.6	3393.5	544.4	7742.5	397.9	5659.5
1.5	A182-LF1	A217-WC1 A217-LC1	29.7	422.5	20.5	291.5	75.1	1067.5	53.8	764.5	148.4	2110	107.5	1529	221.7	3355	161.3	2376	367.7	5230	268.4	3817	611.9	8702.5	447.4	6363.5
1.7	A182-F2	A217-WC4 A217-WC5	32.3	460	22.4	319	79.8	1150	58	814	160	2275	116	1650	239.1	3400	174	2475	397.2	5650	290	4125	660.9	9400	483.4	6875
1.9	A182-F12 A182-F11	A217-WC6	32.3	460	22.4	319	79.8	1150	58	825	160	2275	116	1650	239.1	3400	174	2475	397.2	5650	290	4125	660.9	9400	483.4	6875
1.10	A182-F22	A217-WC9	32.3	460	22.4	319	79.8	1150	58	825	160	2275	116	1650	239.1	3400	174	2475	397.2	5650	290	4125	660.9	9400	483.4	6875
1.11	A182-F21		32.3	460	22.4	319	79.8	1150	58	825	160	2275	116	1650	239.1	3400	174	2475	397.2	5650	290	4125	660.9	9400	483.4	6875
1.13	A182-F5a	A217-C5	32.3	460	22.4	319	79.8	1150	58	825	160	2275	116	1650	239.1	3400	174	2475	397.2	5650	290	4125	660.9	9400	483.4	6875
1.14	A182-F9	A217-C12	32.3	460	22.4	319	79.8	1150	58	825	160	2275	116	1650	239.1	3400	174	2475	397.2	5650	290	4125	660.9	9400	483.4	6875
2.1	A182-F304 A182-F304H	A351-CF3 A351-CF8	30.8	437.5	21.3	302.5	77.7	1050	55.7	792	153.6	2185	111.4	1584	229.6	3265	167.1	2376	381.4	5425	278.4	3960	634.5	9025	464	6600
2.2	A182-F316 A182-F316H	A351-CF3A A351-CF8A A351-CF3M A351-CF8M	30.8	437.5	21.3	302.5	77.7	1050	55.7	792	163.3	2185	111.4	1584	229.6	3265	167.1	2376	381.4	5425	278.4	3960	634.5	9025	464	6600
2.3	A182-F304L A182-F316L		26	370	17.8	253	65	925	46.4	660	128.3	1825	92.8	1320	191.6	2725	139.2	1980	318.2	4525	232	3300	529.1	7525	386.7	5500
2.4	A182-F321 A182-F321H		30.8	437.5	21.3	302.5	77.7	1050	55.7	792	153.6	2185	111.4	1584	229.6	3265	167.1	2376	381.4	5425	278.4	3960	634.5	9025	464	6600
2.5	A182-F347 A182-F347H A182-F348 A182-F34	A351-CF8C	30.8	437.5	21.3	302.5	77.7	105	55.7	792	153.6	2185	111.4	1584	229.6	3265	167.1	2376	381.4	5425	278.4	3960	634.5	9025	464	6600
2.6	A351-CH20	A351-CH20	28.2	415	20.1	286	72.4	1030	51.8	737	143.6	2042.5	104	1479.5	214.3	3047.5	155.8	2216.5	356.1	5065	259.9	3969	592.4	8425	433.1	6160
2.7	A182-F310	A351-CK20	28.2	415	20.1	286	72.4	1030	51.8	737	143.6	2042.5	104.5	1479.5	214.3	3047.5	155.8	2216.5	356.1	5065	259.9	3969	592.4	8425	433.1	6160
3.1	B462	A351-CN7M	26	370	17.8	253	65	925	46.4	660	128.3	1825	92.8	1320	191.6	2725	139.2	1980	318.2	4525	232	3300	529.1	7525	386.7	5500

PRESSURE – TEMPERATURE RATINGS

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Maximum Allowable Non-shock Pressure, psig.

Service Temperature		Class 150					Class 300					Class 600				
°F	°C	WCB (a)	WCB (b)	C5	C12 (c)	LCC (d)	WCB (a)	WCB (b)	C5	C12 (c)	LCC (d)	WCB (a)	WCB (b)	C5	C12 (c)	LCC (d)
-20 to 100	-29 to 38	285	290	290	290	290	740	750	750	750	750	1480	1500	1500	1500	1500
200	93	260	260	260	260	260	675	710	750	750	750	1350	1425	1500	1500	1500
300	149	230	230	230	230	230	655	675	730	730	730	1315	1345	1455	1455	1455
400	204	200	200	200	200	200	635	660	705	705	705	1270	1315	1410	1410	1410
500	260	170	170	170	170	170	600	640	665	665	665	1200	1285	1330	1330	1330
600	316	140	140	140	140	140	550	605	605	605	605	1095	1210	1210	1210	1210
650	343	125	125	125	125	125	535	590	590	590	590	1075	1175	1175	1175	1175
700	371	110	110	110	110		535	570	570	570		1065	1135	1135	1135	
750	399	95	95	95	95		505	530	530	530		1010	1065	1065	1065	
800	427	80	80	80	80		410	510	500	510		825	1015	995	1015	
850	454	65	65	65	65		270	485	440	485		535	975	880	975	
900	482	50	50	50	50		170	450	355	450		345	900	705	900	
950	510	35	35	35	35		105	380	260	375		205	755	520	755	
1000	538	20	20	20	20		50	225	190	255		105	445	385	505	
1050	566		20*	20*	20*			140	140	170			275	280	345	
1100	593		20*	20*	20*			95	105	115			190	205	225	
1150	621			20*	20*				70	75				140	150	
1200	649			20*	20*				45	50				90	105	
Hydrostatic Shell Test Pressure		450	450				125	1125				2225	2250			
Valve Closure Test Pressure	Water	314	814				825	1628				1650				
	Air	80					80					80				

Service Temperature		Class 900					Class 1500					Class 2500				
°F	°C	WCB (a)	WCB (b)	C5	C12 (c)	LCC (d)	WCB (a)	WCB (b)	C5	C12 (c)	LCC (d)	WCB (a)	WCB (b)	C5	C12 (c)	LCC (d)
-20 to 100	-29 to 38	2220	2250	2250	2250	2250	3705	3750	3750	3750	3750	6170	6250	6250	6250	6250
200	93	2025	2135	2250	2250	2250	3375	3560	3750	3750	3750	5625	5930	6250	6250	6250
300	149	1970	2020	2185	2185	2185	3280	3365	3640	3640	3640	5470	5605	6070	6070	6070
400	204	1900	1975	2115	2115	2115	3170	3290	3530	3530	3530	5280	5485	5880	5880	5880
500	260	1795	1925	1995	1995	1995	2995	3210	3325	3325	3325	4990	5350	5540	5540	5540
600	316	1640	1815	1815	1815	1815	2735	3025	3025	3025	3025	4560	5040	5040	5040	5040
650	343	1610	1765	1765	1765	1765	2685	2940	2940	2940	2940	4475	4905	4905	4905	4905
700	371	1600	1705	1705	1705		2665	2840	2840	2840		4440	4730	4730	4730	
750	399	1510	1595	1595	1595		2520	2660	2660	2660		4200	4430	4430	4430	
800	427	1235	1525	1490	1525		2060	2540	2485	2540		3430	4230	4145	4230	
850	454	805	1460	1315	1460		1340	2435	2195	2435		2230	4060	3660	4060	
900	482	515	1350	1060	1350		860	2245	1765	2245		1430	3745	2945	3745	
950	510	310	1130	780	1130		515	1885	1305	1885		860	3145	2170	3145	
1000	538	155	670	575	760		260	1115	960	1270		430	1860	1600	2115	
1050	566		410	420	515			685	705	855			1145	1170	1430	
1100	593		290	310	340			480	515	565			800	860	945	
1150	621		3375	205	225				345	375				570	630	
1200	649		2475	135	155				225	255				370	430	
Hydrostatic Shell Test Pressure		3350	3375				5575	5625				9275	9375			
Valve Closure Test Pressure	Water	2442	2475				4076	4125				6787	6875			
	Air	80					80					80				

Notes (a)-Permissible, but not recommended for prolonged usage above about 427°C(800°F).
(b)-Not to be used over 1100°F.
(c)-Use normalized and tempered materials only.
(d)-Not to be used over 650°F.
*For welding end valves only. Flanged end ratings terminate at 538°C(1000°F).

CONVERSION FACTORS

LENGTH

1 in. = 25.4 mm
1 mm = .03936 in.
1 ft = 30.48 cm
1 meter = 2.28083 ft.
1 micron = .001 mm

AREA

1 sq. in. = 6.4516 sq. cm
1 sq. ft. = 929.03 sq. cm
1 sq. cm = 0.155 sq. in
1 sq. cm = 0.0010764 sq. ft.

VOLUME

1 cu. in. = 16.387 cu. cm
1 cu. ft. = 1728 cu. in.
1 cu. ft. = 7.4805 U.S. gal.
1 cu. ft. = 6.229 British gal.
1 cu. ft. = 28.317 liters
1 U.S. gal. = 0.1337 cu. ft.
1 U.S. gal. = 231 cu. in.
1 U.S. gal. = 3.785 liters
1 British gal. = 1.20094 U.S. gal.
1 British gal. = 277.3 cu. in.
1 British gal. = 4.546 liters
1 liter = 61.023 cu. in.
1 liter = 0.03531 cu. ft.
1 liter = 0.2642 U.S. gal.

WEIGHT

1 ounce av. = 28.35 g
1 lb. av. = 453.59 g
1 gram = 0.03527 oz. av.
1 kg = 2.205 lb. av.
1 cu. ft. of water = 8.33 lb.
1 U.S. gal. of water = 0.03631 lb.
1 British gal. of water = 10.04 lb.
1 cu. ft. of air 60F & 1 atm = 0.0764 lb.

VELOCITY

1 ft. per sec. = 3048 cm per sec.
1 cm per sec. = .032808 ft. per sec.

FLOW

1 cu. ft. per = 448.83 gal. per min.
1 cu. ft. per sec. = 1699. 3 liters per min.
1 U.S. gal. per min. = 0.002228 cu. ft. per sec.
1 U.S. gal. per min. = 0.06308 liter per sec.
1 cu. cm per sec. = 0.0021186 cu. ft. per min.

DENSITY

1 lb. per cu. ft. = 16.019 kg per cu. meter
1 lb. per cu. ft. = 0.0004787 lb. per cu. in.
1 kg per cu. meter = 0.06243 lb. per cu. ft.
1 g per cu. cm = 0.03613 lb. per cu. in.

Pressure

1 in. of water = 0.03613 lb. per sq. in.
1 in. of water = 0.07355 in. of Hg
1 in. of water = 0.4335 lb. per sq. in.
1 in. of water = 0.88265 in. of Hg
1 in. of mercury = 0.49116 lb. per sq. in.
1 in. of mercury = 13.596 in. of water
1 in. of mercury = 1.13299 ft. of water
1 atmosphere = 14.696 lb. per sq. in.
1 atmosphere = 760 mm of Hg
1 atmosphere = 29.92 in. of Hg
1 atmosphere = 33.899 ft. of water
1 lb. per sq. in. = 27.70 in. of water
1 lb. per sq. in. = 2.036 in. of Hg
1 lb. per sq. in. = .0703066 kg per sq. cm
1 kg per sq. cm = 14.223 lb. per sq. in.
1 dyne per sq. cm = .0000145 lb. per sq. in.
1 micron = .00001943 lb. per sq. in.

Energy

1 B.T.U. = 777.97 ft. lbs.
1 erg = 9.4805×10.11 B.T.U.
1 erg = 7.3756×10.8 ft. lbs.
1 kilowatt hour = 2.655×10.6 ft. lbs.
1 kilowatt hour - 1.3410 h.p. hr
1 kg calorie = 3.968 B.T.U.

Power

1 horsepower = 33.000 ft. lb. per min.
1 horsepower = 550 ft. lb. per sec.
1 horsepower = 2.546,5 B.T.U. per ht.
1 horsepower = 745.7 watts
1 watt = 0.00134 horsepower
1 watt = 44.26 ft. lbs. per min.

Temperature

Temperature Fahrenheit(F)
= 9/5 Centigrade (C) + 32
= 9/5 R + 32
Temperature Centigrade(C)
= 5/9 Fahrenheit (F) - 32
= 5/4 R
Temperature Reaumur (R)
= 4/9 Fahrenheit (F) - 32
= 4/5 C
Absolute Temperature Centigrade
or Kelvin (K) = Degrees C + 273.16
Absolute Temperature Fahrenheit
or Rankine (R) = Degrees F + 459.69

Heat Transfer

1 B.T.U. per sq. ft. = 0.2712 g cal. per sq. c
1 g calorie per sq. cm
= 3.687 B.T.U. per sq. ft.
1 B.T.U. per hr. per sq. ft. per ˚F
= 4.88 kg cal. per hr. per sq. m per ℃
1 kg cal. per hr. per sq. m per ℃
= .205 B.T.U. per hr. per sq. per ˚F
1 boiler horsepower = 33479 B.T.U. per h

Viscosity

1 Centipoise = .000672 lb. per ft. sec.
1 Centistoke = .00001076 sq. ft. per sec.

SYMBOLS CONVERSION

kg/cm2	psi	bar	Pa	kPa	MPa
1	14.22313	9.80665x10^{-1}	9.80665x10^{4}	9.80665x10^{1}	9.80665x10^{-2}
0.070308	1	6.89486x10^{-2}	6.89486x10^{3}	6.89486	6.78489x10^{-3}
1.01972	14.50356	1	x10^{5}	x10^{2}	x0.1
1.01972 x10^{-5}	1.45036x10^{-4}	1x10^{-5}	1	x10^{-3}	x10^{-6}
1.01972 x10^{-2}	1.45036x10^{-1}	1x10^{-2}	x10^{3}	1	x10^{-3}
1.01972 x10^{-1}	1.45036x10^{-2}	x10^{1}	x10^{6}	x10^{3}	1

PRESSURE SEAL BONNET DESIGN

- Pressure seal valves are both lighter and smaller than corresponding sizes of bolted bonnet valves because the former has no heavy flange in the body or in the bonnet. Their design insures a more accurate seal to prevent leakage. High pressure in the valve body in utilized to act against the bottom of the bonnet. This causes the small size gasket to compress to form a perfect seal with the valves during operation.

Adjusting bolts mechanically control the expansion or shrinkage of the body materials caused by fluctuations of temperature and / or pressure of the fluid.

For ordinary bolts bonnet valves, the bolt must be periodically tightened to adjust creep on the bolts, flanges and gaskets.

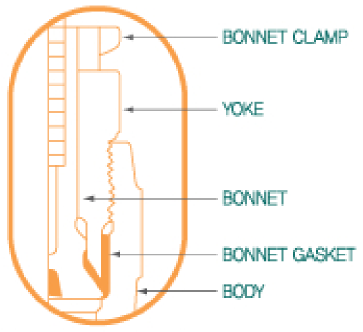
Because creep is often the primary cause of fluid leakage, the development of Pressure Seal Valves is of primary importance becasue they solve this leakage problem.

The design of Pressure Seal Valves requires adequate material strength for use in the body and bonnet. Bolted Bonnet Valves in the other hand require correct stress checking of the bottom of the flange due to bolt tightening to see if they remain in the allowable tolerances. This is not a problem with Pressure Seal Valves.

- We offer a variety of Pressure Seal Bonnet Joints. The two most popular bonnet retention methods are : a one-piece threaded retaining ring and a segmented retaining ring. Both utilize the design principle of employing internal line pressure to force the bonnet against the seal ring to form pressure-tight, metal-to-metal joint.

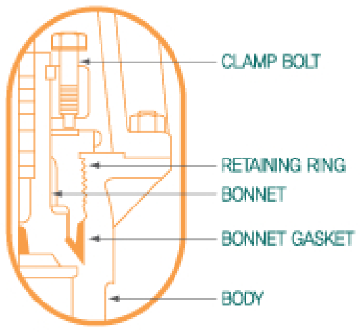
ONE PIECE THREADED RETAINING RING DESIGN

TYPE I



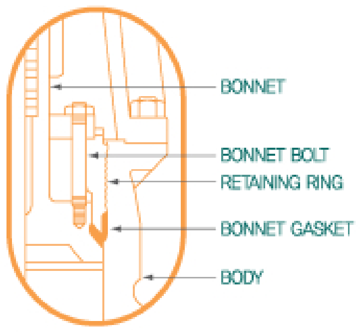
Small diameter bonnet

TYPE II



Middle diameter bonnet

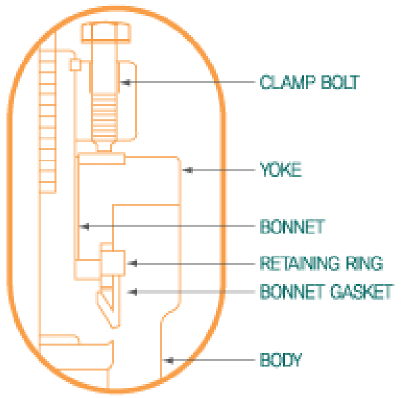
TYPE III



Large diameter bonnet

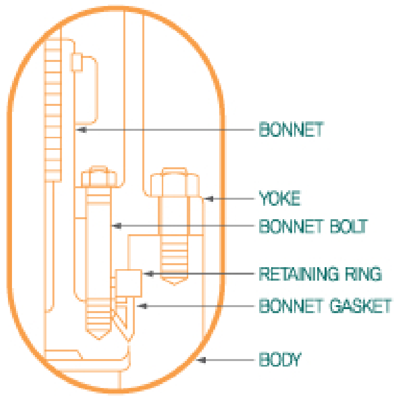
SEGMENTED RETAINING RING DESIGN

TYPE IV



Middle diameter bonnet

TYPE V



Large diameter bonnet

CARE FOR HANDLING VALVES

1. Before mounting valves:

Before mounting valves, be sure that adequate valves have been prepared to exactly the service conditions including the maximum design pressures and temperatures. Foreign objects such as sands or scales may be left in the pipes, and care should be taken to remove all of them by filters or strainers to protect valve seat surfaces during subsequent valve commissioning.

2. Mounting valves:

On mounting valves, clean the inside of pipes again so that no welding spatters, chips, scales or sands are left. For installation of flanged end valves, flange bolts should be tightened alternately and diagonally. Where extraordinary external forces such as piping stress may be applied to the flanges of valves being mounted, provide valve supports or any other adequate protective measures.

3. Retightening valves glands:

When leakage is detected from the gland area while the valve is being in service, the gland should be immediately retightened. Tighten the gland slowly and gradually until the leakage stops, while rotating the valve hand wheel. In case the valve operation torque has been found considerably increased after these procedures, it is recommended to replace all packing rings at the time of valve maintenance.

4. Replacing packing rings:

It is recommended to replace packing rings during valve maintenance operation, but never while the valve is being pressurized in service, except the line pressure is reduced to the atmospheric level. HK case carbon and low alloy steel valves are provided with the backseats or bonnets bushes. If leakage from the gland area cannot be stopped by retightening the gland, operate the valve to its full open position and add a few packing rings or replace packing rings utilizing sealing function of these backseats.

Sealing function of backseats is sometimes disturbed due to rust or other foreign objects trapped inside. It should be carefully checked before adding or replacing packing rings that backseats function properly. When the valve is highly pressurized, it sometimes causes danger to replace all of packing rings. In this case, adding a few new rings or replacing a few rings on top rings on top of the packing chamber is recommended as a first aid solution.

For replacement o packing rings, first remove the gland bolts and then packing rings. Clean the packing changer and the valve stem. After checking that all sliding parts are in good condition, securely install new packing rings. Press new packing rings lightly a few times with the gland and then evenly tighten the gland.

HK Product Warranty

All HK cast steel valves are guaranteed for 12 months after placement in service, but not exceeding 18 months after shipment from the factories of HK Valve, provided that the valves are properly handled according to the relevant HK operation manual.

CAUTION

Pressure temperature ratings and other performance data published in this catalog have been developed from our design calculation, in-house testing, field reports provided by our customers and/or published official standards or specifications.
They are good only to cover typical applications as a general guideline to users of HK products introduced in this catalog.
For any specific application has been complied with the utmost care, we assume no responsibility for errors, impropriety or inadequacy. Any information provided is this catalog is subject to from-time-to-time change without notice for error rectification, product discontinuation, design modification, new product introduction or any other cause that Han Kook Valve considers necessary. This edition cancels all previous issues.

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