

KEY VALVES UK LTD

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● Standards

Design and Manufacture: Cast steel gate valve to API 600 (ISO 10434) or API 6D; Cast stainless steel gate valve to API 603 or API 600; Forged steel gate valve to API 602. Inspection and Test: API 598, API 600 or API 6D.

End flange dimension: ASME B16.5 (for NPS ≤ 24); ASME B16.47 series B, API 605 or ASME B16.47 series A, MSS SP-44 (for NPS > 24).

BW end dimension: ASME B16.25.

Face to face and end to end: ASME B16.10.

Socket-weld dimension: ASME B16.11.

Pressure-temperature ratings: ASME B16.34.

● Design of Disc

Gate Valves with NPS ≥ 2 are of wedge flexible gate; Gate valves with NPS < 2 are of wedge solid gate.

● Body and Bonnet Connection

The body and bonnet of Class 150~Class 900 gate valves are usually connected with studs and nuts. And the body and bonnet of Class 1500~Class 2500 gate valves are usually of pressure seal design.

● Gasket of Cover Flange

Carbon steel or stainless steel + flexible graphite combined gasket is used for Class 150 gate valve; Stainless steel + flexible graphite wounded gasket is used for Class 300 gate valve; Stainless steel + flexible graphite wounded gasket is used for Class 600 gate valve, and ring joint gasket is also optional for Class 600 gate valve; Ring Joint gasket is used for Class 900 gate valve; Pressurized seal design is used for Class 1500 ~ Class 500 gate valve.

● Actuation

Hand wheel or gear box is usually used for gate valve actuation. Chain wheel and electric actuator can be also used for gate valve actuation if being requested by the customers.

● Belleville Spring Loaded Packing Impacting System

If being requested by the customer, the Belleville spring loaded packing impacting system can be adopted for enhancing the durability and reliability of the packing seal.

● Packing Seal

Molded flexible graphite is used for packing material. PTFE or combined packing material can be also used if being requested by the customer. The internal surface of the stuffing box, of which area is contacted with the packing, is of excellent finish (Ra3.2 μm). The stem surface, contacting with the packing, should be rolled and pressed after being precisely machined, so as to reach to the high finish and compactness (Ra0.8 μm) and ensure the reliable tightness of the stem area.

● Back Seating Design

All our gate valves have the back seating design. In most cases, the carbon steel gate valve is fitted with a renewable back seat. For stainless steel gate valve, the back seat is machined directly in the bonnet or is machined after welding. When the gate valve is at fully open position, the sealing of the back seat can be very reliable. However, as per the requirement of API 600, it is not advisable to add or change packing by the mean of back seating when the valve is Pressure containing.

● Seat

For carbon steel gate valve, the seat is usually forged steel. The sealing surface of the seat is spray welded with hard alloy specified by the customer. Renewable threaded seat is used for NPS ≤ 10 gate valves, and welded on seat can be also optional if being requested by the customer. Welded on seat is used for NPS ≤ 10 carbon steel gate valves. For Stainless steel gate valve, integral seat is usually adopted, or to weld hard alloy directly integrally. Threaded or welded on seat is also optional for stainless steel gate valve if being requested by the customer.

● Stem Design

The stem is of integral forged design. The minimum diameter of the stem shall per the standard requirement. The connection of the stem and disc is T type. The strength of the connecting area is bigger than that of the T threaded part of the stem. The strength test of that area conforms to API 591.

● Stem Nut

Usually, the stem nut is made of copper alloy, it is also can be made of ASTM A439 D2 if being requested by the customer. For large sized gate valves (NPS 10 for Class 150, NPS 8 for Class 300, NPS 6 for Class 600, NPS 5 for Class 900), rolling bearing is fitted at the two sides of the stem nut in order to minimize the open and close torque of the gate valve.

● Special Gate Valve

Besides the common gate valves, LEAD also makes cryogenic gate valve, Jacketed Gate Valve, Bellow Sealed Gate Valve, Extension Stem Gate Valve for underground application, Slat Gate Valve, etc.

Cast Steel Gate Valve(API 600)

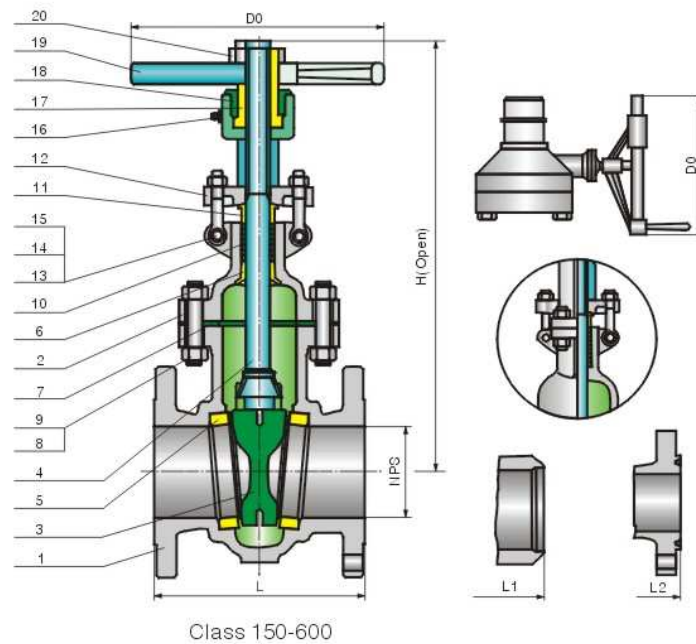


● Design Description

- Full port design
- OS & Y, Outside screw and yoke
- BB, Bolted bonnet
- Flexible wedge, fully guided
- Choice of solid or split wedge
- Renewable seat rings
- Forged T-head stem
- Rising stem and non-rising handwheel
- Flanged or butt welding ends
- Available with bg operator

● Applicable Standards

- Design standard: API 600 & ASME B16.34
- Face to face: ASME B16.10
- End flanges: ASME B16.5 ASME B16.47
- Butt welding ends: ASME B16.25
- Inspection and test: API 598



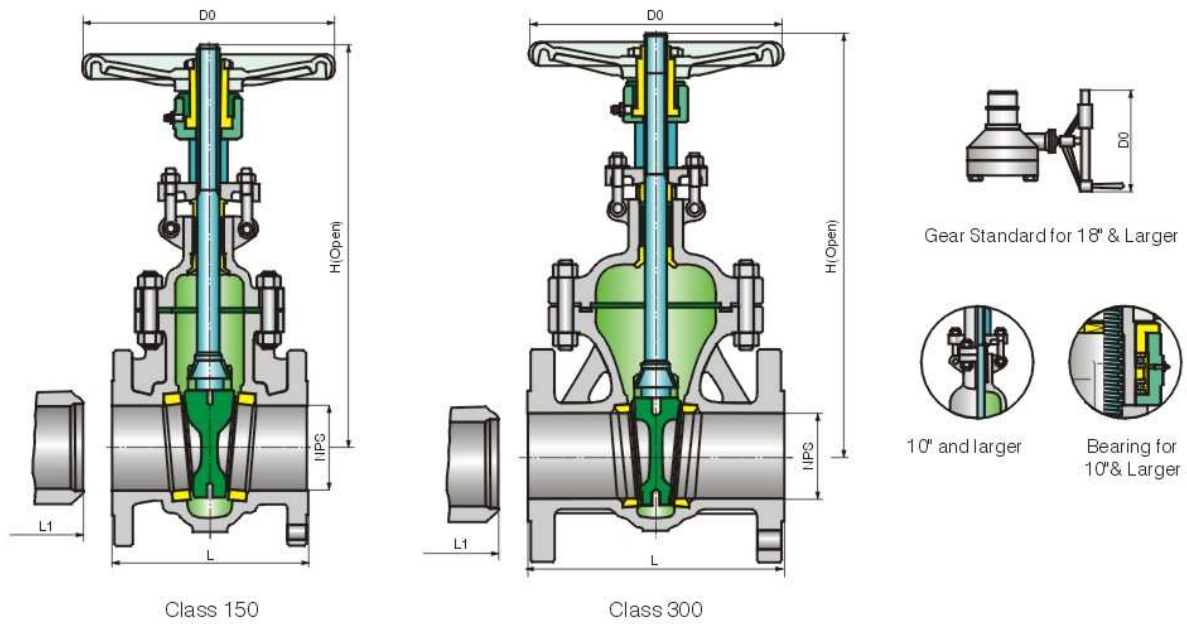
● Materials of Parts

Valve Part Name	Carbon Steel		Alloy steel			Stainless Steel			
Body	A216WCB	A352LCB	A217 Wc6	A217 Wc9	A217 C5	A351 Cf8	A351 CF8M	A351 Cf3	A351 CF3M
Bonnet	A216WCB	A352LCB	A217 Wc6	A217 Wc9	A217 C5	A351 Cf8	A351 CF8M	A351 Cf3	A351 CF3M
Stem	A182 F6a	A182F304	A182 F304	A182F304	A182 F304	A182 F304	A182 F316	A182 F304	A182 F316L
Stud	A193 B7	A320 L7	A193 B16	A193 B16	A193 B8	A193 B8	A193 B8M	A193 B8	A193 B8M
Nut	A194 2H	A194 4	A194 4	A194 4	A194 8	A194 8	A194 8M	A194 8	A194 8M
Yoke	A216 WCB	A352LCB	A217 Wc6	A127 C5	A351 Cf8	A351 Cf8	A351 Cf8	A351 Cf3	A351 CF3M
Back Seat	A182 F6a	A182F304	A182 F304	A182F304	A182 F304	A182 F304	A182 F316	A182 F304L	A182 F316L
Packing Bushing	A276 410	A276 304	A276 304	A276 304	A276 304	A276 304	A276 316	A276 304	A276 316
Packing Plate	A216WCB	A352LCB	A217 Wc6	A217 Wc9	A217 Cs5	A351 Cf8	A351 CF8M	A351 Cf3	A351 CF3M

Gate Valve



Cast Steel Gate Valve (API 600)



Gate Valve

● Dimensions Data

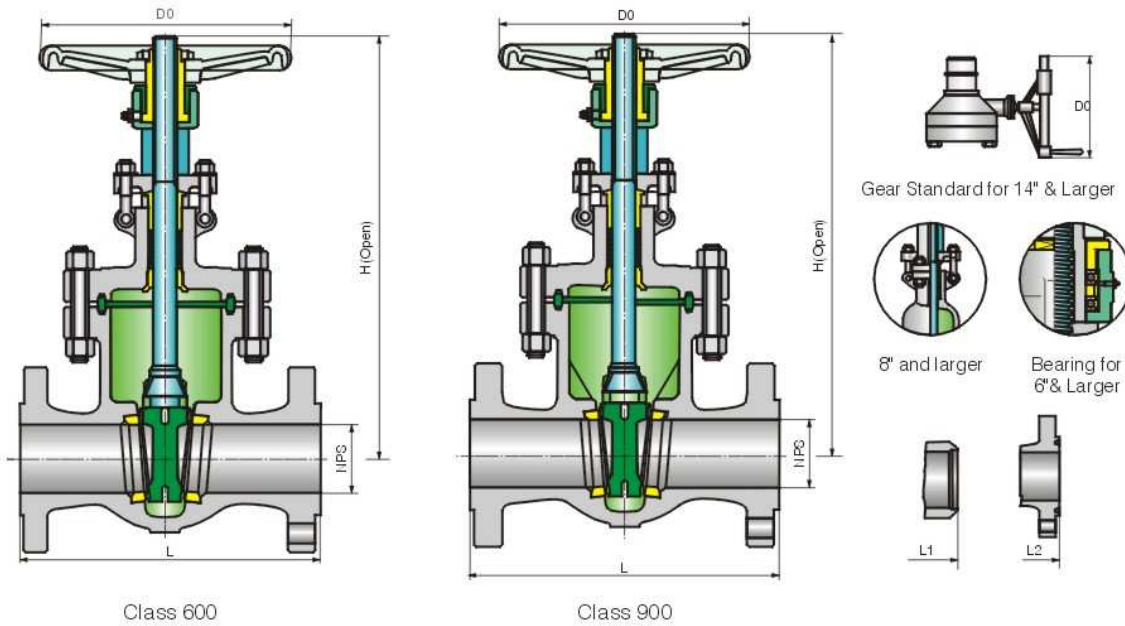
Class 150

Size	NPS	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	36	40	42	48
	DN	40	50	65	80	100	150	200	250	300	350	400	450	500	600	650	700	750	800	900	1000	1050	1200
L (RF)	in	6.5	7.00	7.50	8.00	9.00	10.50	11.50	13.00	14.00	15.00	16.00	17.00	18.00	20.00	22.00	24.00	24.00	28.00	28.00	30.00	31.00	34.00
	mm	165	178	191	203	229	267	292	330	356	381	406	432	457	508	559	610	610	711	711	762	787	864
L1 (BW)	in	6.5	8.5	9.50	11.12	12.00	15.88	16.50	18.00	19.75	22.50	24.00	26.00	28.00	32.00	34.00	36.00	36.00	38.00	40.00	42.00	43.00	46.00
	mm	165	216	241	283	305	403	419	457	502	572	610	660	711	813	864	914	914	965	1016	1067	1092	1168
H (Open)	in	15.7	15.31	17.28	19.69	23.43	30.59	38.39	45.67	54.72	61.22	71.30	82.80	90.55	102.72	109.45	130.98	141.97	145.98	154.49	168.50	175.39	193.31
	mm	392	389	439	500	595	777	975	1160	1390	1555	1811	2103	2300	2609	2780	3327	3606	3708	3924	4280	4455	4910
D0	in	7.86	8	8	10	10	14	14	16	18	22	24	25	27	30	24	24	24	24	24	24	32	32
	mm	200	200	200	250	250	350	350	400	450	560	600	640	680	760	610	610	610	610	610	610	810	810

Class 300

Size	NPS	1 1/2	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24	26	28	30	32	36
	DN	40	50	65	80	100	150	200	250	300	350	400	450	500	600	650	700	750	800	900
L/L1 (RF/BW)	in	7.5	8.50	9.50	11.12	12.00	15.88	16.50	18.00	19.75	30.00	33.00	36.00	39.00	45.00	49.00	53.00	55.00	60.00	68.00
	mm	190	216	241	283	305	403	419	457	502	762	838	914	991	1143	1245	1346	1397	1524	1727
H (OPEN)	in	14.7	16.93	19.88	20.87	24.00	31.75	39.38	48.82	57.87	64.76	72.48	77.13	86.38	102.28	110.24	122.05	130.71	140.16	153.94
	mm	374	430	505	530	612	805	1000	1240	1470	1645	1841	1959	2194	2598	2800	3100	3320	3560	3910
D0	in	7.88	8	10	10	12	14	16	18	20	24	24	24	24	24	24	24	32	32	32
	mm	200	200	250	250	300	350	400	450	500	600	600	610	610	610	610	610	810	810	810

Cast Steel Gate Valve (API 600)



● Dimensions Data

Class 600

Size	NPS	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24
	DN	50	65	80	100	150	200	250	300	350	400	450	500	600
L/L1 (RF/BW)	in	11.50	13.00	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00
	mm	292	330	356	432	559	660	787	838	889	991	1092	1194	1397
L2 (RTJ)	in	11.62	13.12	14.12	17.12	22.12	26.12	31.12	33.12	35.12	39.12	43.12	47.25	55.38
	mm	295	333	359	435	562	663	790	841	892	994	1095	1200	1407
H (OPEN)	in	17.91	23.14	21.65	27.17	35.83	41.93	49.49	57.80	63.90	71.50	88.98	106.50	101.63
	mm	455	588	550	690	910	1065	1257	1468	1623	1816	2260	2705	2810
D0	in	10	10	10	14	18	20	25	27	24	24	24	24	24
	mm	250	250	250	350	450	500	640	680	610	610	610	610	610

Class 900

Size	NPS	2	2 1/2	3	4	6	8	10	12	14	16	18	20	24
	DN	50	65	80	100	150	200	250	300	350	400	450	500	600
L/L1 (RF/BW)	in	14.50	16.50	15.00	18.00	24.00	29.00	33.00	38.00	40.50	44.50	48.00	52.00	61.00
	mm	368	419	381	457	610	737	838	965	1029	1130	1219	1321	1549
L2 (RTJ)	in	14.62	16.62	15.12	18.12	24.12	29.12	33.12	38.12	40.88	44.88	48.50	52.50	61.75
	mm	371	422	384	460	613	740	841	968	1038	1140	1232	1334	1568
H (OPEN)	in	24.41	27.76	29.02	32.48	41.93	47.99	52.95	72.44	74.88	81.00	87.00	101.00	104.00
	mm	620	705	737	825	1065	1219	1345	1550	1900	2055	2215	2565	2640
D0	in	12	14	14	16	20	24	24	24	32	32	38	38	40
	mm	300	350	350	400	500	600	610	610	800	800	950	950	1000

Class 1500, 2500 proposed structure of self-sealing, For flange connection with the company.

Gate Valve



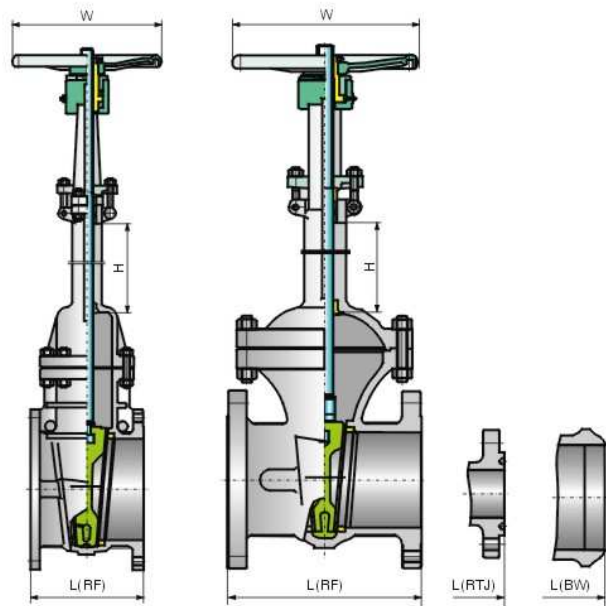
Cryogenic Gate Valve

● Applicable Standards

Design and Manufacture: API600, BS1414, API602, BS5352
 Face to Face Dimension: ASME B16.10
 End Flange Dimension: ASME B16.5
 Socket Welded Ends Dimension: ASME B16.11
 Threaded Ends Dimension: ASME B 1.20.1
 Pressure-Temperature Ratings: ASME B16.34
 Type of Operation: Manual, Gear, Electric, Pneumatic
 Inspection and Test: API 598

● Design Description

Cryogenic valves normally refer to valves with working temperature below -110°C. It is widely used in LNG, LPG and other low temperature industry FBIC now offers Gate, Globe and Ball valves for cryogenic service up to -196°C. Our in-house computer controlled test facility can certify valves up to 24" size: NPS 1/2" ~ 24" Pressure: Class 150Lb ~ 800Lb Materials: L6CB, LCC, LC3, CF8, CF8M, LF2, LF3, F304, F31



Gate Valve

● Main Material

PART NAME	MATERIAL		
	-46°C	-101°C	-196°C
BODY	A352-LCB, LCC, LC3, A351-CF8, CF8M		
SEAT	A350-LF2, LF3, A182-F304, F316		
DISC	A352-LCB, LCC, LC3, A351-CF8, CF8M		
STEM	A182-F6, F304, F316		
GASKET	(SS304, SS316)+GRAPHITE, PTFE		
BONNET	A352-LCB, LCC, LC3, A351-CF8, CF8M		
NUT	A194-4, 8, 8M		
BOLT	A320-L7, A193-B8, B8M		
BACKSEAT BUSHING	A182-F6, F304, F316		
STEM PACKING WASHER	A182-F6, F304, F316		
LANTERN RING	A182-F6, F304, F316		
STEM PACKING	GRAPHITE, PTFE		
GLAND	A276-T410, T304, T316		
GLAND FLANGE	A216-WCB, A351-CF8		
GLAND EYEBOLT	A193-B7, B8		
GLAND EYEBOLT	A194-2H, 8		
YOKE	A216-WCB, A351-CF8		
STEM NUT	Cu-ALLOY, A439-D2		
RETAINING NUT	1025, STAINLESS STEEL		
HANDWHEEL	DUCTILE IRON OR STEEL		
H. W. LOCK NUT	1025, STAINLESS STEEL		
SEALING FACE	13%Cr/13%Cr, STL/13%Cr, STL/STL, 316/316, 316/316L, 304/304, 304L/304L, SS321/SS321		

"*" ≥ 300Lb Can be provided when clients required

Cryogenic Gate Valve



Construction and Dimension

150Lb

Size		L(RF)	L(RTJ)	L(BW)	W	H(*)		
NPS	DN					-46°C	-101°C	-196°C
1 1/2	40	165	178	165	180	110	130	160
2	50	178	191	216	200	110	130	170
3	80	203	216	283	250	120	150	190
4	100	229	241	305	250	130	160	200
6	150	267	279	403	300	140	170	220
8	200	292	305	419	350	140	170	220
10	250	330	343	457	400	150	180	240
12	300	356	368	502	450	150	180	240
14	350	381	394	572	500	160	190	250
16	400	406	419	610	600	160	190	250
18	450	432	445	660	600	160	190	250
20	500	457	470	711	680	170	200	260
24	600	508	521	813	760	170	200	260

300Lb

Size		L(RF)	L(RTJ)	L(BW)	W	H(*)		
NPS	DN					-46°C	-101°C	-196°C
2	50	292	295	292	250	110	130	170
3	80	356	359	356	250	120	150	190
4	100	432	435	432	350	130	160	200
6	150	559	562	559	450	140	170	220
8	200	660	664	660	500	140	170	220
10	250	787	790	787	600	150	180	240
12	300	838	841	838	680	150	180	240
14	350	889	892	889	760	160	190	250
16	400	991	994	991	800	160	190	250
18	450	1092	1095	1092	915	160	190	250
20	500	1194	1200	1194	960	170	200	260
24	600	1397	1407	1397	-	170	200	260

600Lb

Size		L(RF)	L(RTJ)	L(BW)	W	H(*)		
NPS	DN					-46°C	-101°C	-196°C
1 1/2	40	191	203	191	160	110	130	160
2	50	216	232	216	200	110	130	170
3	80	283	298	283	250	120	150	190
4	100	305	321	305	250	130	160	200
6	150	403	419	403	350	140	170	220
8	200	419	435	419	400	140	170	220
10	250	457	473	457	450	150	180	240
12	300	502	518	502	500	150	180	240
14	350	762	778	762	600	160	190	250
16	400	838	854	838	600	160	190	250
18	450	914	930	914	680	160	190	250
20	500	991	1010	991	760	170	200	260
24	600	1143	1165	1143	915	170	200	260

* the extension part for low temperature service can be designed acc.to clients requirement.

Gate Valve



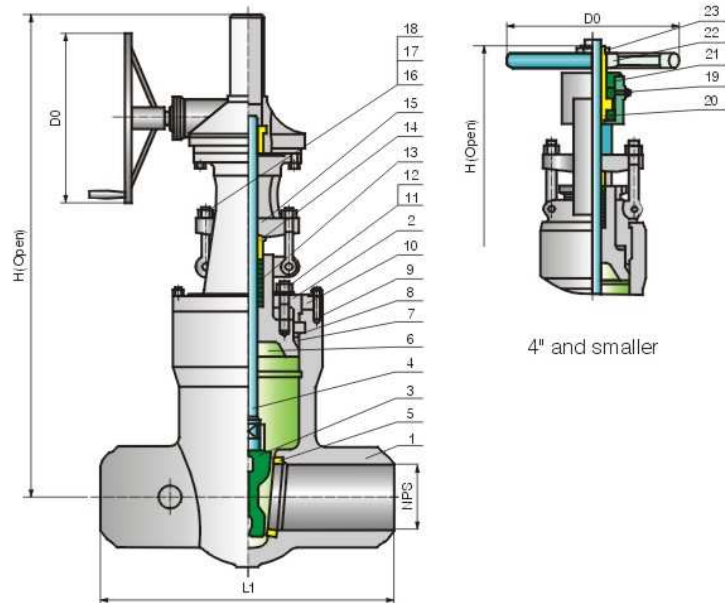
Cast Steel Gate Valve (Pressure Seal)

Design Description

- PSB, Pressure seal bonnet
- Flexible wedge, fully guided
- Choice of solid or split wedge
- Renewable seat rings
- Forged-head stem
- Rising stem and non-rising handwheel
- Flanged or butt welding ends
- Available with bg operator

Applicable Standards

- Design standard: API 600 & ASME B16.34
- Face to face: ASME B16.10
- End flanges: ASME B16.5
- Butt welding ends: ASME B16.25
- Inspection and test: API 598



Class 900-2500

Materials of Parts

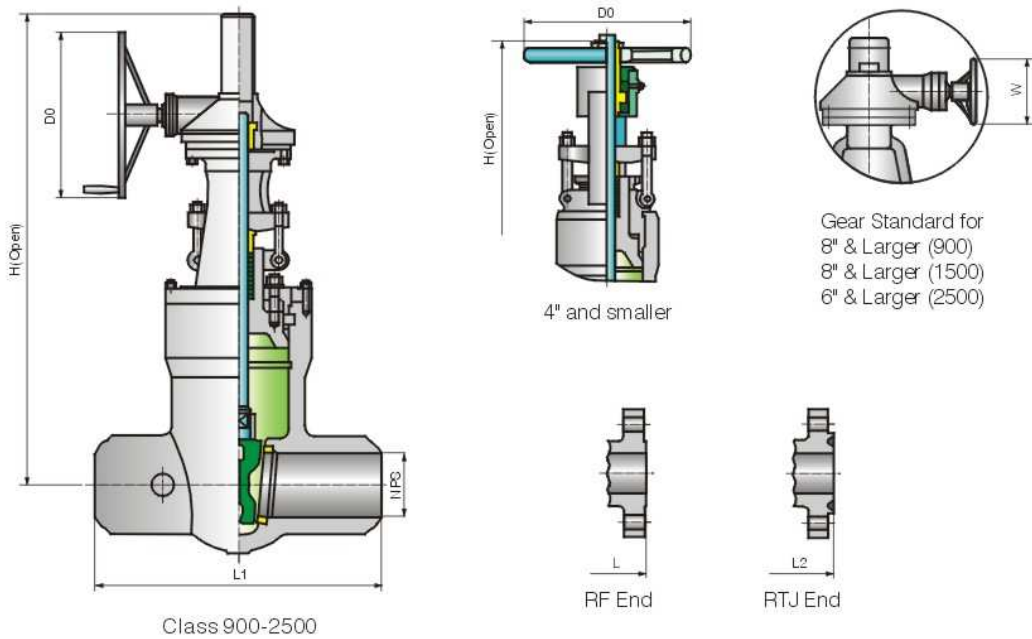
NO.	Part name	ASTM Material		
1	Body	A216-WCB	A217-WC6	A351-CF3M
2	Yoke	A216-WCB	A217-WC6	A351-CF3M
3	Wedge	A216-WCB+HF	A217-WC6+HF	A351-CF3M+HF
4	Stem	A182-F6a	A182-F6a	A182-316L
5	Seat ring	A105+HF	A182-F11+HF	A240-316+HF
6	Bonnet	A216-WCB+HF	A182-F11	A351-CF3M
7	Bonnet gasket ¹⁾	A304SS Ring	A304SS Ring	A316SS Ring
8	Adapter ring	A276-410	A276-410	A276-316L
9	Retainer	A276-410	A276-410	A276-316L
10	Yake cap	A216-WCB	A217-WC6	A351-CF3M
11	Bonnet stud	A193-B7	A193-B16	A193-B8M
12	Bonnet stud nut	A194-2H	A194-4	A194-8M
13	Packing	Graphite		
14	Gland	A276-420	A276-304	A276-316L
15	Gland flange	A216-WCB	A217-WC6	A351-CF8M
16	Eyebolt pin	A276-420	A276-420	A276-316
17	Eyebolt	A193-B7	A193-B16	A193-B8M
18	Eyebolt nut	A194-2H	A194-4	A194-8M
19	Grease fitting	Brass+steel		
20	Yokesleeve	Aluminu-bronze ²⁾ /A439-D2		
21	Yokesleeve jam nut	Carbon steel	Stainless steel	
22	Handwheel	A216-WCB		
23	Handwheel nut	Carbon steel		

Note: 1). Graphite optional

2). Ductile Ni-resist optional

3). Wedge and seat ring may either be solid facing material or a base material equal to or better than the body/bonnet material with facing as shown.

Cast Steel Gate Valve (Pressure Seal)



Dimensions Data

Class 900

Size	NPS DN	2 50	2 1/2 65	3 80	4 100	6 150	8 200	10 250	12 300
L (RF)	in	14.50	16.50	15.00	18.00	24.00	29.00	33.00	38.00
	mm	368	419	381	457	610	737	838	965
L1 (BW)	in	8.50	10.00	12.00	14.00	20.00	26.00	31.00	36.00
	mm	216	254	305	356	508	660	787	914
L2 (RTJ)	in	14.62	16.62	15.12	18.12	24.12	27.12	33.12	38.12
	mm	371	422	384	460	613	740	841	968
H (Open)	in	24.00	30.00	30.71	33.86	40.35	50.63	60.63	70.28
	mm	610	762	780	860	1025	1286	1540	1785
D0	in	12	14	14	16	20	24	24	24
	mm	300	350	350	400	500	610	610	610

Class 1500

Size	NPS DN	2 50	2 1/2 65	3 80	4 100	6 150	8 200	10 250	12 300
L (RF)	in	14.50	16.50	18.50	21.50	27.75	32.75	39.00	44.50
	mm	368	419	470	546	705	832	991	1130
L1 (BW)	in	8.50	10.00	12.00	16.00	22.00	28.00	34.00	39.00
	mm	216	254	305	406	559	711	864	991
L2 (RTJ)	in	14.62	16.62	18.62	21.62	28.00	33.13	39.38	45.12
	mm	371	422	473	549	711	842	1000	1146
H (Open)	in	24.00	30.55	30.90	34.40	40.35	53.46	61.74	74.50
	mm	610	776	785	874	1025	1358	1568	1892
D0	in	12	16	16	20	24	24	24	24
	mm	300	400	400	500	600	610	610	610

Class 2500

Size	NPS DN	2 50	2 1/2 65	3 80	4 100	6 150	8 200	10 250	12 300
L (RF)	in	17.75	20.00	22.78	26.50	36.00	40.25	50.00	56.00
	mm	451	508	578	673	914	1022	1270	1422
L1 (BW)	in	11.00	13.00	14.50	18.00	24.00	30.00	36.00	41.00
	mm	279	330	368	457	610	762	914	1041
L2 (RTJ)	in	17.87	20.25	23.00	26.88	36.50	40.87	50.88	56.88
	mm	454	514	584	683	927	1038	1292	1445
H (Open)	in	24.00	30.55	30.90	34.40	44.02	53.46	66.14	74.50
	mm	610	776	785	874	1118	1358	1680	1892
D0	in	14	18	18	20	24	24	24	24
	mm	350	450	450	500	610	610	610	610