



## 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 B 16.5 (for NPS $\leq$ 24) ; ASME B 16.47 series B, API 605 or ASME B 16.47 series A, MSS SP-44(for NPS $>$ 24).

BW end dimension: ASME B 16.25.

Socket-weld dimension: ASME B 16.11.

Face to face and end to end:ASME B 16.10.

Pressure-temperature ratings:ASME B 16.34.

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Socket-weld dimension: ASME B 16.11.

Face to face and end to end: ASME B 16.10.

Pressure-temperature ratings: ASME B 16.34.

### 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 μ m). 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 μ m) and ensure the reliable tightness of the stem area.

### 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.

### 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 ressure 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 Nut

Usually, the stem nut is made of ASTM A439 D2. it is also can be made of copper alloy 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.

### 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.

### Body and Bonnet Connection

The body and bonnet of Class 150-Class900 gate valves Are usually connected with studs and nuts. And The body and bonnet of Class 1500-Class 2500 gate valves are usually of pressurized seal design.

### 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.

### Design of Disc

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

### Stem Design

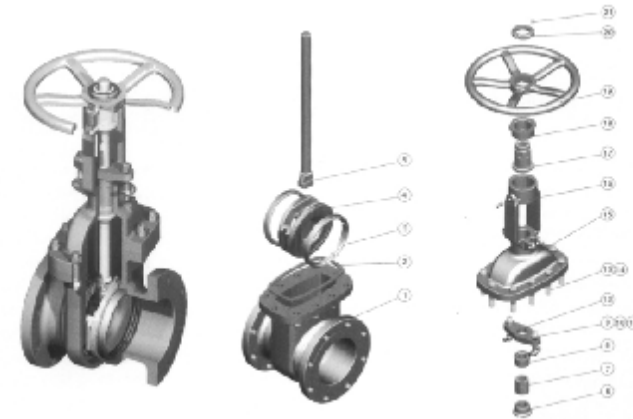
The stem is of integral forged design. The minimum diameter of the stem shall as per the standard requirement. The connection of the stem and discis T type. The strength of the connecting area is bigger than that of the T threaded part of the stem, The strength test of that area conforms to API 591.

### Special Gate Valve

Besides the common gate valves, 3D also makes cryogenic gate valve, Jacketed Gate Valve, Bellow Sealed Gate Valve, Extension Stem Gate Valve for underground application, Flat Gate Valve, etc.



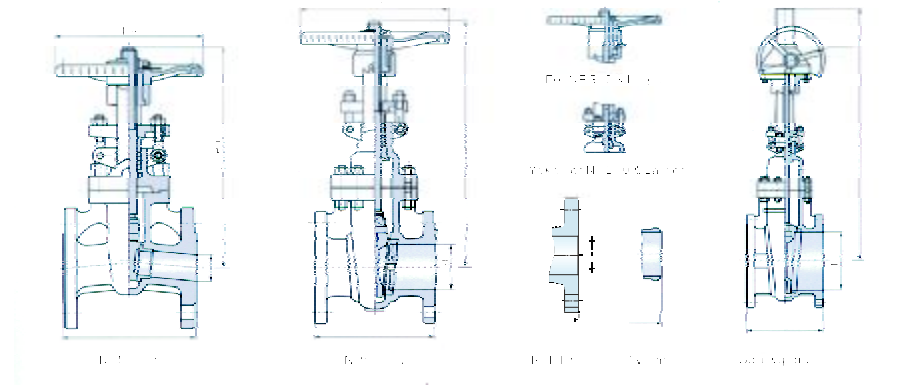
### Parts and Material list



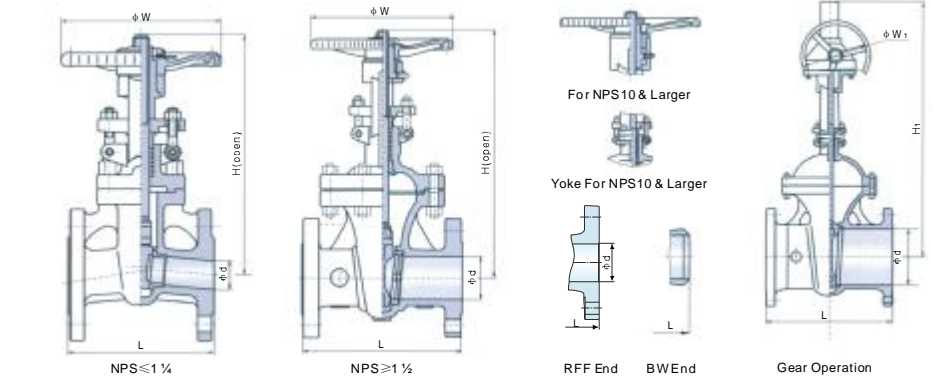
Parts No.	Parts Name	Materials				
		WCB/Trim 1	WCB/Trim 5	WCB/Trim 8	CF8/304	CF8M/316
1	Body	ASTM A216 WCB	ASTM A216 WCB	ASTM A216 WCB	ASTM A351 CF8	ASTMA351 CF8M
2	Gasket	Soft Iron + Graphite or 304 + Graphite			304 + Graphite	316 + Graphite
3	Seating	A 105+13Cr	A 105+STL	A 105+STL	ASTM A351 CF8	ASTMA351 CF8M
4	Gate	ASTM A216 WCB+13Cr	ASTM A216 WCB+STL	ASTM A216 WCB+13Cr	ASTM A351 CF8	ASTMA351 CF8M
5	Stem	ASTM A182F6a	ASTMA182F6a	ASTM A182F6a	ASTM A182 F304	ASTMA182 F316
6	Backseat bushing	ASTM A182F6a	ASTMA182F6a	ASTM A182F6a	ASTM A351 CF8	ASTMA351 CF8M
7	Packing	Graphite	Graphite	Graphite	Graphite	Graphite
8	Gland	ASTM A182F6a	ASTMA182F6a	ASTM A182 F6a	ASTM A182 F304	ASTMA182 F316
9	Gland eyebolt	ASTMA193B7	ASTMA193B7	ASTM A193B7	ASTM A193B8	ASTMA193B8M
10	Eyebolt nut	ASTMA194 2H	ASTMA194 2H	ASTM A194 2H	ASTM A194 8	ASTMA194 8M
11	Eyebolt pin	ASTM A36	ASTM A36	ASTMA36	304ss	316ss
12	Gland flange	ASTM A216WCB	ASTMA216WCB	ASTM A216WCB	ASTM A351 CF8	ASTMA351 CF8M
13	Bonnet bolt	ASTMA193B7	ASTMA193B7	ASTM A193B7	ASTM A193B8	ASTMA193B8M
14	Bonnet nut	ASTMA194 2H	ASTMA194 2H	ASTM A194 2H	ASTM A194 8	ASTMA194 8M
15	Bonnet	ASTM A216WCB	ASTMA216WCB	ASTM A216WCB	ASTM A351 CF8	ASTMA351 CF8M
16	Nipple	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel
17	Stem nut	ASTM A439 D2	ASTMA439 D2	ASTM A439 D2	ASTM A439 D2	ASTMA439 D2
18	Yoke sleeve nut	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel
19	Hand wheel	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron
20	Hand wheel nut	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Carbon steel
21	Set screw	ASTM A193B7	ASTMA193 B7	ASTM A193B7	ASTM A193 B7	ASTMA193 B7

Note: The chart above only lists out some common composition of steel gate valve parts. We may provide other different parts material composition according to the customer's request or the actual valve working condition.

Class 150 & JIS 10K Cast Steel Gate Valve



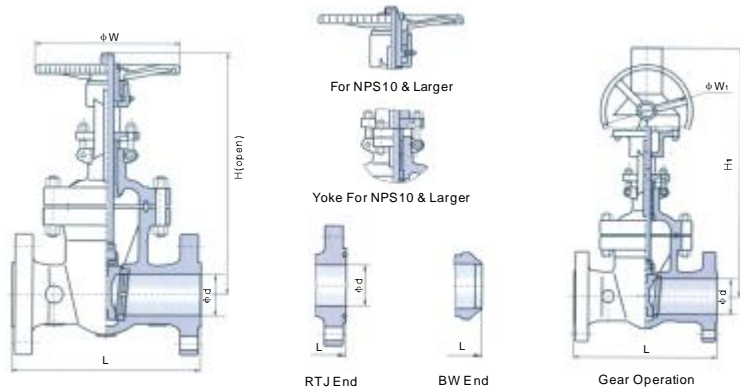
Class 300 & JIS 20K Cast Steel Gate Valve



Class	Size		Dimensions(mm)								Weight(Kg)		
	NPS	DN	L			d	H	H1	W	W1	Hand wheel	Gear box	
			RF	RFF	BW								
Class 150	1/2	15	108	108	108	14	195	-	120	-	4	-	
	3/4	20	117	117	117	19	210	-	120	-	5	-	
	1	25	127	127	127	25	240	-	140	-	7	-	
	1 1/4	32	140	140	140	32	300	-	180	-	10	-	
	1 1/2	40	165	165	165	38	395	-	200	-	14	-	
	2	50	178	178	216	51	400	-	200	-	19	-	
	2 1/2	65	190	190	241	64	435	-	200	-	25	-	
	3	80	203	203	283	76	515	-	250	-	33	-	
	4	100	229	229	305	102	595	-	280	-	49	-	
	5	125	254	254	381	127	725	-	280	-	62	-	
	6	150	267	267	403	152	780	820	300	310	77	104	
	8	200	292	292	419	203	975	1020	350	310	123	150	
	JIS 10K	10	250	330	330	457	254	1150	1200	400	310	188	215
		12	300	356	356	502	305	1380	1430	450	310	288	315
		14	350	381	381	572	337	1545	1580	500	310	385	435
		16	400	406	406	610	387	1733	1780	500	460	500	552
		18	450	432	432	660	438	1915	1990	500	460	601	653
		20	500	457	457	711	489	2122	2220	600	460	764	816
24		600	508	508	813	591	2520	2600	600	460	1007	1185	
26		650	559	559	864	633	-	2800	-	600	-	1550	
28	700	610	610	914	684	-	3050	-	600	-	1880		
30	750	610	610	914	735	-	3130	-	600	-	2300		
32	800	711	711	965	779	-	3280	-	600	-	2550		
34	850	762	762	1016	830	-	3500	-	600	-	2950		
36	900	711	711	1016	874	-	3720	-	600	-	3390		

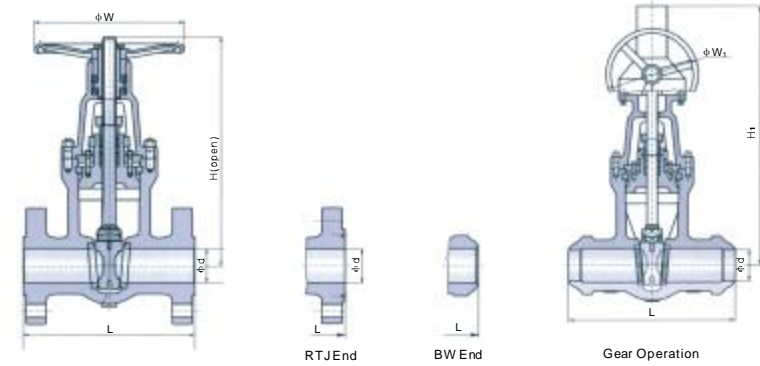
Class	Size		Dimensions (mm)								Weight (Kg)		
	NPS	DN	L			d	H	H1	W	W1	Hand wheel	Gear box	
			RF	RFF	BW								
Class 300	1/2	15	140	140	140	14	198	-	120	-	6	-	
	3/4	20	152	152	152	19	215	-	140	-	7	-	
	1	25	165	165	165	25	245	-	160	-	10	-	
	1 1/4	32	178	178	178	32	306	-	180	-	15	-	
	1 1/2	40	190	190	190	38	400	-	200	-	21	-	
	2	50	216	216	216	51	420	-	200	-	25	-	
	2 1/2	65	241	241	241	64	446	-	200	-	30	-	
	3	80	283	283	283	76	537	-	250	-	48	-	
	4	100	305	305	305	102	619	650	280	310	73	100	
	5	125	381	381	381	127	722	750	300	310	99	126	
	6	150	403	403	403	152	806	835	350	310	130	186	
	8	200	419	419	419	203	1000	1030	400	310	208	235	
	JIS 20K	10	250	457	457	457	254	1240	1280	450	310	334	386
		12	300	502	502	502	305	1425	1460	500	310	450	502
		14	350	762	762	762	337	1585	1620	600	460	704	756
		16	400	838	838	838	387	1790	1830	500	460	923	965
		18	450	914	914	914	438	1960	2000	650	460	1131	1224
		20	500	991	991	991	489	2158	2220	750	460	1345	1400
24		600	1143	1143	1143	591	2576	2620	900	600	2122	2385	
26		650	1245	1245	1245	633	-	2850	-	600	-	3000	
28		700	1346	1346	1346	684	-	3080	-	600	-	3300	
30		750	1397	1397	1397	735	-	3180	-	600	-	3550	
32	800	1524	1524	1524	779	-	3300	-	600	-	4400		
34	850	1626	1626	1626	830	-	3550	-	600	-	5200		
36	900	1727	1727	1727	874	-	3760	-	600	-	6050		

Class 600 & Class 900 Cast Steel Gate Valve



Class	Size		Dimensions (mm)								Weight (Kg)	
	NPS	DN	L			d	H	H1	W	W1	Hand wheel	Gear box
			R F	RTJ	BW							
Class 600	2	50	292	295	292	51	444	-	200	-	32	-
	2 1/2	65	330	333	330	64	500	-	250	-	52	-
	3	80	356	359	356	76	558	585	280	310	60	87
	4	100	432	435	432	102	665	695	300	310	107	134
	5	125	508	511	508	127	760	790	350	310	175	227
	6	150	559	562	559	152	868	900	450	310	216	268
	8	200	660	664	660	203	1073	1110	500	310	399	451
	10	250	787	791	787	254	1263	1300	650	460	605	657
	12	300	838	841	838	305	1600	1650	700	460	851	893
	14	350	889	892	889	337	1705	1750	900	460	1177	1232
	16	400	991	994	991	387	1835	1900	900	460	1513	1568
	18	450	1092	1095	1092	438	-	2020	-	600	-	1980
	20	500	1194	1200	1194	489	-	2172	-	600	-	2460
	24	600	1397	1407	1397	591	-	2650	-	600	-	3650
Class 900	2	50	368	371	368	51	500	-	280	-	70	-
	2 1/2	65	419	422	419	64	550	-	280	-	110	-
	3	80	381	384	381	76	610	660	300	310	140	167
	4	100	457	460	457	102	702	750	350	310	200	227
	5	125	559	562	559	127	850	900	400	310	258	285
	6	150	610	613	610	152	980	1060	500	460	358	410
	8	200	737	740	737	203	1100	1140	650	460	550	600
	10	250	838	841	838	254	1320	1370	700	460	1000	1100
	12	300	965	968	965	305	1500	1560	900	460	1215	1310
	14	350	1029	1038	1029	322	1900	1950	900	600	1600	1700
	16	400	1130	1140	1130	373	2050	2100	900	600	2150	2330

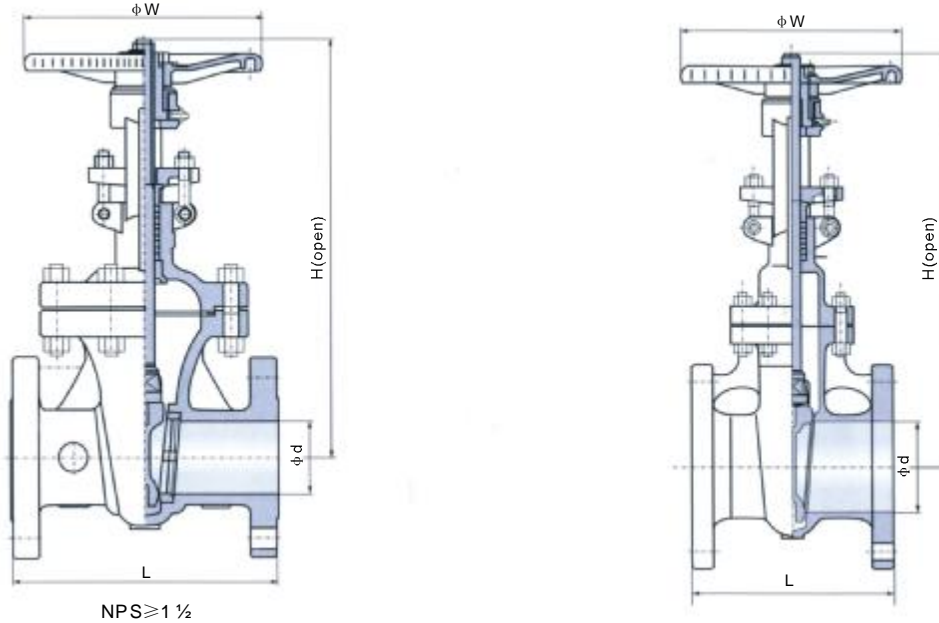
Class 1500 & Class 2500 Cast Steel Gate Valve



Class	Size		Dimensions (mm)								Weight (Kg)		
	NPS	DN	L			d	H	H1	W	W1	Hand wheel	Gear box	
			R F	RTJ	BW								
Class 1500	2	50	368	371	368	51	510	-	280	-	70	-	
	2 1/2	65	419	422	419	64	560	-	300	-	110	-	
	3	80	470	473	470	76	620	670	350	310	175	202	
	4	100	546	549	546	102	728	770	400	310	270	300	
	5	125	673	676	673	127	870	920	450	310	378	405	
	6	150	705	711	705	144	1000	1070	500	460	520	575	
	8	200	832	841	832	192	1130	1180	750	460	820	915	
	10	250	991	1000	991	239	1360	1410	900	600	1560	1750	
	12	300	1130	1146	1130	287	-	1620	-	600	-	2120	
	14	350	1257	1276	1257	315	-	2020	-	600	-	2600	
	16	400	1384	1407	1384	360	-	2180	-	600	-	3450	
	Class 2500	2	50	451	454	451	42	530	580	280	310	100	130
		2 1/2	65	508	514	508	52	580	630	300	310	150	180
		3	80	578	584	578	62	650	700	350	310	245	275
4		100	673	683	673	87	750	800	400	310	390	420	
5		125	794	807	794	96	900	960	500	460	550	580	
6		150	914	927	914	131	1040	1100	600	460	780	835	
8		200	1022	1038	1022	179	1150	1200	750	460	1260	1355	
10		250	1270	1292	1270	223	1400	1460	900	600	2380	2565	
12		300	1422	1445	1422	265	-	1660	-	600	-	3250	



### API 603 Class 150~Class 300 Cast Stainless Steel Gate Valve



#### Standards

Design and Manufacture: API603

Inspection and Test: API598

End flange dimension: ASME B16.5

Face to face: ASME B16.10

Pressure-temperature ratings: ASME B16.34

Size		Class 150					Class 300				
NPS	DN	Dimensions(mm)				Weight(Kg)	Dimensions(mm)				Weight(Kg)
		L	d	H	W		L	d	H	W	
1/2	15	108	14	195	120	3	140	14	198	120	5
3/4	20	117	19	210	120	4	152	19	215	140	6
1	25	127	25	240	140	6	165	25	245	160	9
1 1/4	32	140	32	300	180	8	178	32	306	180	12
1 1/2	40	165	38	395	200	12	190	38	400	200	18
2	50	178	51	365	160	16	216	51	400	200	22
2 1/2	65	190	64	420	160	22	241	64	435	200	26
3	80	203	76	485	200	28	283	76	515	250	41
4	100	229	102	580	250	42	305	102	600	280	62
5	125	254	127	710	250	53	381	127	715	300	84
6	150	267	152	741	280	65	403	152	780	350	110
8	200	292	203	960	300	105	419	203	980	400	177
10	250	330	254	1055	350	160	457	254	1200	400	284
12	300	356	305	1352	400	245	502	305	1400	400	382
14	350	381	337	1520	400	328	762	337	1560	500	598
16	400	406	387	1734	500	425	838	387	1760	500	785
18	450	432	438	1920	500	510	914	438	1940	600	962
20	500	457	489	2110	600	650	991	489	2140	600	1144
24	600	508	591	2520	700	855	1143	591	2550	700	1805