



# Cast Steel Gate, Globe & Check Valves

ASME Classes 150 – 900

API 600 / 623 / 594 / ASME B16.34 | Bolted Bonnet Design

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# CHAODA INTRODUCTION

The Chaoda Group is proud to be able to offer a unique combination in the Cast Gate, Globe and Check Valve industry. We have field proven designs, the latest in processing technology, and high efficiency manufacturing **creating a high-quality Gate, Globe and Check Valve.**

We are a fully integrated manufacturer owning all the processes required to produce these valves. From the design, to the foundry, to the machining and processing, to the assembly and testing, we own it and control it. This streamlined, tightly controlled system generates a highly consistent product tailored to your needs at a cost that will not break the budget.

Since 1984, The Chaoda Group has been committed to producing high quality valves for industry at a competitive price. Consistency in ownership has kept this strategy on track and maintained a philosophy of ongoing investment in research and development as well as manufacturing efficiencies. This keeps us ahead of the competition. The result is the ultimate blend of high-quality Cast Gate, Globe and Check Valves.

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## INDUSTRIES WE SERVE





## Chaoda Valve – Your Low Fugitive Emissions Partner

Over the past several years in the United States, the EPA has challenged end users in the refining, chemical and petrochemical industries to continuously lower fugitive emissions from their facilities. As a result of this, the problem of fugitive emissions of Volatile Organic Compounds (VOCs) has grown in importance in refineries, chemical plants, and petrochemical plants in the US and around the world. When fugitive emissions sources have been analyzed, 60% or more of these fugitive emissions

originate from valves, with rising stem valves such as gate valves and globe valves making up most of those emissions. For this reason, it is critical when selecting a valve manufacturer to partner with, to choose one that has demonstrated experience and a commitment to producing a high-quality, low fugitive emission product.

### Testing is the Key

Chaoda Valve is proud to have partnered with our valued end users to meet and exceed these fugitive emissions challenges. Chaoda Gate & Globe Valves are designed, manufactured & tested to provide maximum emissions of 100 ppm of VOCs. Chaoda Valve has performed extensive 3rd party testing at reputable US laboratories on our multi-turn valves in accordance with API 624. This test protocol involves applying pressure to the valve filled with methane gas, and performing 310 mechanical cycles and 3 thermal cycles. During this test, leakage of methane from the valve is detected in accordance to EPA Method 21. The maximum allowable leakage for API 624 is 100 ppm of methane. In the tests performed, all Chaoda valves tested resulted in an average leakage of **under 50 ppm**, meeting and exceeding the requirements of this rigorous test.



Chaoda has performed a full range of tests for our product scope.

### Certified Low Leaking Valve Technology

As a result, Chaoda Valves are considered to have been tested in accordance to Generally Accepted Good Engineering Practice and are 'Certified Low Leaking Valve Technology' as defined by the EPA. Chaoda can provide 5-year low fugitive emissions warranties in accordance with EPA consent decree requirements to our end users upon request.

### An Ongoing Commitment

Chaoda's commitment to excellence does not stop with the extensive testing we have already performed. Chaoda Valve has long experience with capital projects in regions such as the Middle East, Europe and Southeast Asia which often require production fugitive emissions tests for valves, such as testing per the requirements of ISO 15848 Part 2. Due to this experience, we can perform production fugitive emissions testing on valves per end user requirements to assure the user of excellent fugitive emissions performance.

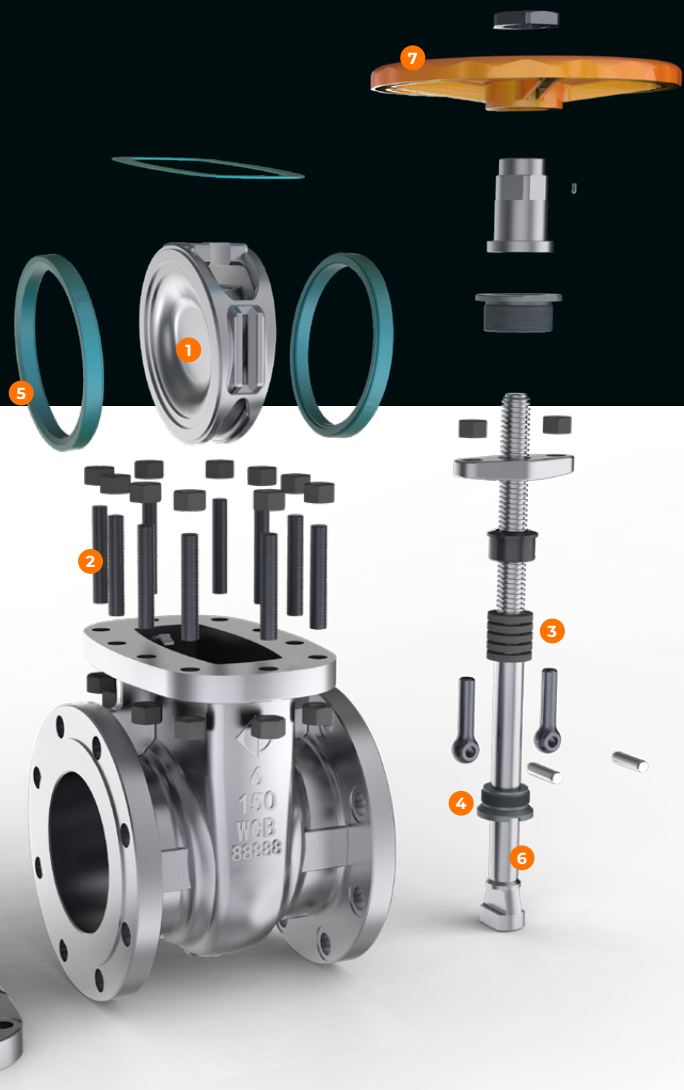


# API 600 GATE VALVE

ASME Class 150, 300, 600, 900

## Design Features

Chaoda's API 600 design gate valves feature a robust design that has been optimized for use in refinery, petrochemical and chemical plant applications.



<b>Basic Design</b>	API 600
<b>Testing</b>	API 598
<b>End Dimension</b>	
<i>Flanged</i>	ASME B16.5 (NPS<24) ASME B16.47 series B or A (NPS>24)
<i>Butt Weld</i>	ASME B16.25
<b>Face-to-Face:</b>	ASME B16.10
<b>P/T Ratings:</b>	ASME B16.34

## FEATURES

### 1) Wedge Design

All cast steel gate valves are equipped standard with a flex wedge design to allow seating surfaces to adapt to changes in the body/seat surfaces induced by thermal expansions and pipeline loads.

### 2) Bolted Bonnet Design

### 3) Stem Packing Design

Gate valves are equipped standard with low-emissions graphite packing qualified per API 622. Gate valves can be optionally live-loaded with Belleville springs for improved performance in thermal cycling applications.

### 4) Backseat Design

All cast gate valves are equipped standard with a backseat to allow for sealing in case of packing leakage.

### 5) Seat Design

Cast carbon steel gate valves are equipped standard with seal-welded seat rings. Cast stainless steel gate valves are equipped standard with integral seats. Seat and/or wedge surfaces can be hardfaced with CoCr-A or other hardfacing overlays.

### 6) Stem Design

Stems are integral 1-piece forged design. Stems are designed to fail outside the pressure boundary and has been validated by stem strength testing performed per API RP 591.

### 7) Operation

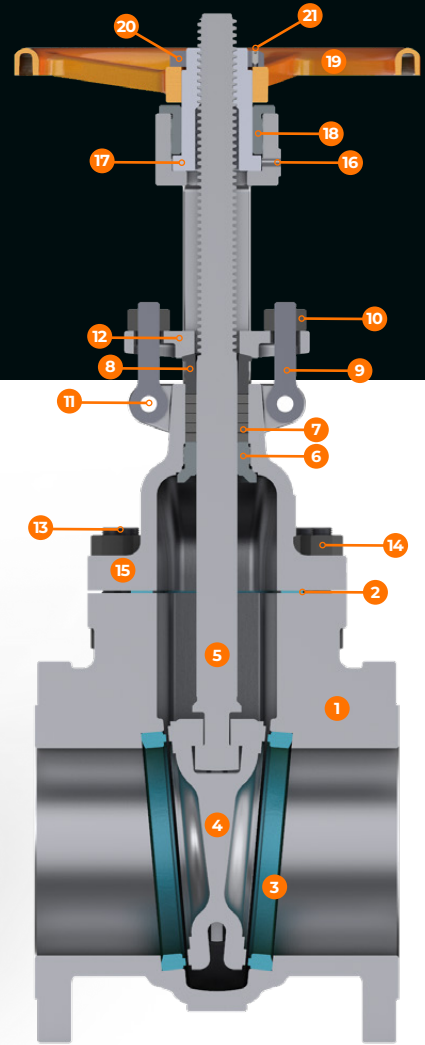
Gate valves are equipped standard with handwheels or gear operators depending on size and customer requirement. Gate valves can be supplied bare stem with actuator mounting flanges on customer request.

Note: All information contained in this catalog is subject to change without notice.

# API 600 GATE VALVE

ASME Class 150, 300, 600, 900

Standard Parts and Materials



ITEM	PART NAME	WCB API TRIM 8	LCC API TRIM 12	C5 API TRIM 5	CF8M API TRIM 12	CD3MN 1/2 HARDFACE TRIM
1	Body	ASTM A216 WCB	ASTM A352 LCC	ASTM A217 C5	ASTM A351 CF8M	ASTM A995 CD3MN
2	Gasket Class 150	Corrugated 304SS + Graphite	Corrugated 304SS + Graphite	Corrugated 304SS + Graphite	Corrugated 316SS + Graphite	Corrugated S31803 + Graphite
	Gasket Class 300 - 600	Spiralwound 304SS + Graphite	Spiralwound 304SS + Graphite	Spiralwound 304SS + Graphite	Spiralwound 316SS + Graphite	Spiralwound S31803 + Graphite
	Gasket Class 900	RTJ 316SS	RTJ 316SS	RTJ 316SS	RTJ 316SS	RTJ S31803
3	Seat Rings**	ASTM A105 + HF*	ASTM A350 LF2 + HF*	ASTM A182 F5 + HF*	Integral + HF*	Integral + HF*
4	Wedge	ASTM A216 WCB + 13%Cr	ASTM A352 LCC + 316SS	ASTM A217 C5 + HF*	ASTM A351 CF8M	ASTM A995 CD3MN
5	Stem	ASTM A182 F6a	ASTM A182 F316	ASTM A182 F6a	ASTM A182 F316	ASTM A182 F51
6	Backseat Bushing	ASTM A182 F6a	ASTM A182 F316	ASTM A182 F6a	Integral	Integral
7	Packing			Graphite		
8	Gland	ASTM A182 F6a	ASTM A182 F316	ASTM A182 F6a	ASTM A182 F316	ASTM A182 F51
9	Gland Eyebolt	ASTM A193 B7	ASTM A320 L7	ASTM A193 B16	ASTM A193 B8M	ASTM A193 B8M
10	Eyebolt Nut	ASTM A194 2H	ASTM A194 7	ASTM A194 4	ASTM A194 8M	ASTM A194 8M
11	Eyebolt Pin			ASTM A36		
12	Gland Flange	ASTM A216 WCB	ASTM A352 LCC	ASTM A217 C5	ASTM A351 CF8M	ASTM A351 CF8
13	Bonnet Stud***	ASTM A193 B7	ASTM A320 L7	ASTM A193 B16	ASTM A193 B8M	ASTM A193 B8M
14	Bonnet Nut***	ASTM A194 2H	ASTM A194 7	ASTM A194 4	ASTM A194 8M	ASTM A194 8M
15	Bonnet	ASTM A216 WCB	ASTM A352 LCC	ASTM A217 C5	ASTM A351 CF8M	ASTM A995 CD3MN
16	Grease Fitting			Steel		
17	Stem Nut	Aluminum Bronze	Aluminum Bronze	Aluminum Bronze	Aluminum Bronze	Aluminum Bronze
18	Yoke Sleeve Nut			CS (ASTM 1035)		
19	Handwheel			CS		
20	Handwheel Nut			CS (ASTM 1035)		
21	Set screw			CS (ASTM 1035)		

\* - HF Denotes CoCr-A hardfacing applied to sealing surface (Stellite® 6 or equivalent) | \*\* - Seat Rings are seal-welded into valve body

\*\*\* - If NACE compliance for exposed service is required, carbon steel valves can be supplied with appropriate bolting (WCB - B7M/2HM, LCC - L7M/7M)

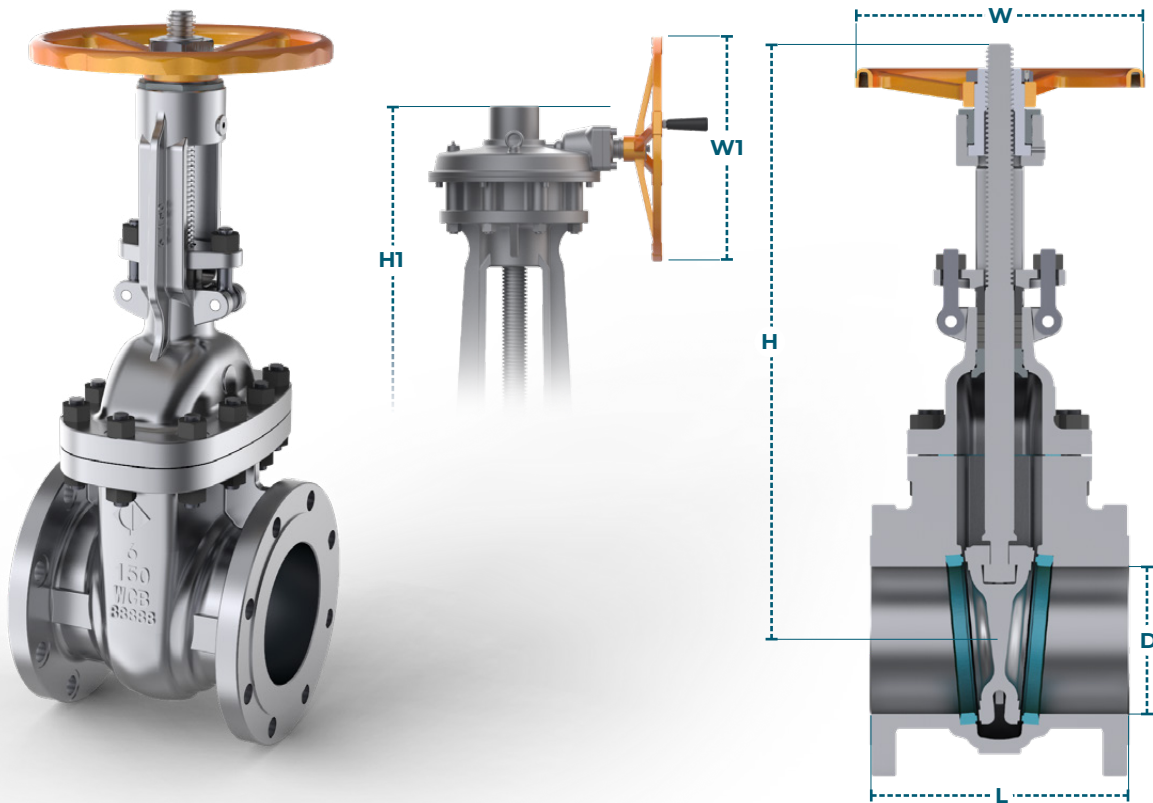
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# API 600 GATE VALVE

ASME Class 150

Dimensional Information



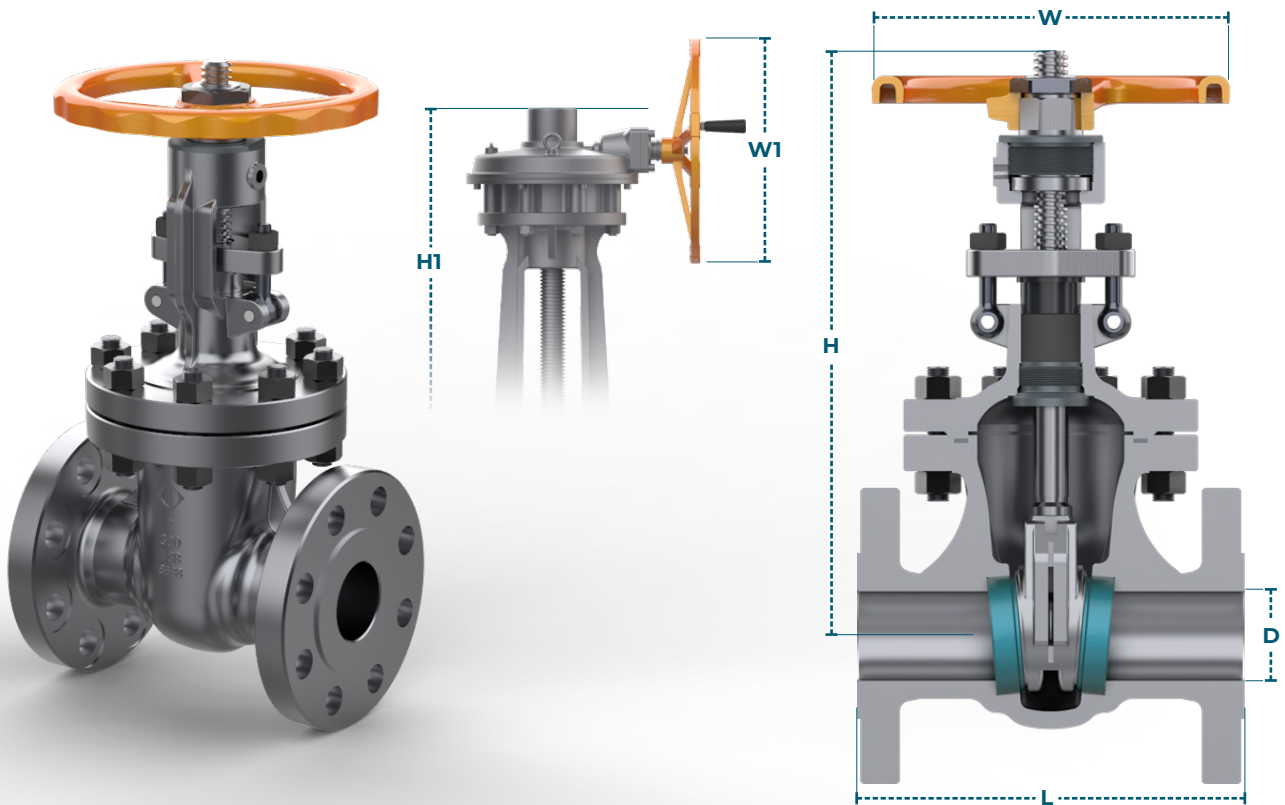
CL. 150 SIZE	DIMENSIONS (INCH)								WEIGHT (LBS)	
	RF	L RTJ	BW	D	H	H1	W	W1	HW	GO
2	7.0	7.5	8.5	2.0	16.0	-	7.9	-	42	-
2 1/2	7.5	8.0	9.5	2.5	17.5	-	7.9	-	55	-
3	8.0	8.5	11.1	3.0	20.2	-	9.8	-	73	-
4	9.0	9.5	12.0	4.0	23.9	-	11.0	-	108	-
6	10.5	11.0	15.9	6.0	30.7	32.3	11.8	11.8	170	229
8	11.5	12.0	16.5	8.0	38.4	40.2	13.8	11.8	271	331
10	13.0	13.5	18.0	10.0	46.7	47.2	15.7	11.8	415	474
12	14.0	14.5	19.8	12.0	54.3	56.3	17.7	11.8	635	695
14	15.0	15.5	22.5	13.3	60.8	62.2	19.7	17.7	849	959
16	16.0	16.5	24.0	15.2	68.2	70.1	19.7	17.7	1103	1217
18	17.0	17.5	26.0	17.2	75.4	78.3	19.7	17.7	1325	1440
20	18.0	18.5	28.0	19.3	83.5	87.4	23.6	19.7	1685	1799
24	20.0	20.5	32.0	23.3	99.2	102.4	23.6	19.7	2220	2613
26	22.0	-	34.0	24.9	-	110.2	-	23.6	-	3418
28	24.0	-	36.0	26.9	-	120.1	-	23.6	-	4145
30	24.0	-	36.0	28.9	-	123.2	-	23.6	-	5072
32	28.0	-	38.0	30.7	-	129.1	-	23.6	-	5623
34	30.0	-	40.0	32.7	-	137.8	-	23.6	-	6505
36	28.0	-	40.0	34.4	-	146.5	-	23.6	-	7475
40	31.9	-	-	38.4	-	159.4	-	23.6	-	9702
42	34.0	-	-	40.2	-	165.4	-	23.6	-	11025
48	36.0	-	-	45.9	-	186.6	-	23.6	-	15656

Note: All information contained in this catalog is subject to change without notice.

# API 600 GATE VALVE

ASME Class 300

Dimensional Information



CL. 300	DIMENSIONS (INCH)								WEIGHT (LBS)		
	SIZE	L			D	H	H1	W	W1	HW	GO
		RF	RTJ	BW							
2	8.5	9.1	8.5	2.0	16.5	-	7.9	-	55	-	
2 1/2	9.5	10.1	9.5	2.5	17.6	-	7.9	-	66	-	
3	11.1	11.7	11.1	3.0	21.1	-	9.8	-	106	-	
4	12.0	12.6	12.0	4.0	24.4	25.6	11.0	11.8	161	221	
6	15.9	16.5	15.9	6.0	31.7	32.9	13.8	11.8	287	410	
8	16.5	17.1	16.5	8.0	39.4	40.6	15.7	11.8	459	518	
10	18.0	18.6	18.0	10.0	48.8	50.4	17.7	11.8	736	851	
12	19.8	20.4	19.8	12.0	56.1	57.5	19.7	17.7	992	1107	
14	30.0	30.6	30.0	13.3	62.4	63.8	23.6	17.7	1552	1667	
16	33.0	33.6	33.0	15.2	70.5	72.0	25.6	17.7	2035	2128	
18	36.0	36.6	36.0	17.2	77.2	78.7	25.6	19.7	2494	2699	
20	39.0	39.8	39.0	19.3	85.0	87.4	29.5	19.7	2966	3087	
24	45.0	45.9	45.0	23.3	101.4	103.1	35.4	23.6	4679	5259	
26	49.0	50.0	49.0	24.9	-	112.2	-	23.6	-	6615	
28	53.0	54.0	53.0	26.9	-	121.3	-	23.6	-	7718	
30	55.0	56.0	55.0	28.9	-	125.2	-	23.6	-	9261	
32	60.0	61.1	60.0	30.7	-	129.9	-	23.6	-	10805	
34	64.0	65.1	64.0	32.7	-	139.8	-	23.6	-	11687	
36	68.0	69.1	68.0	34.4	-	148.0	-	23.6	-	13892	

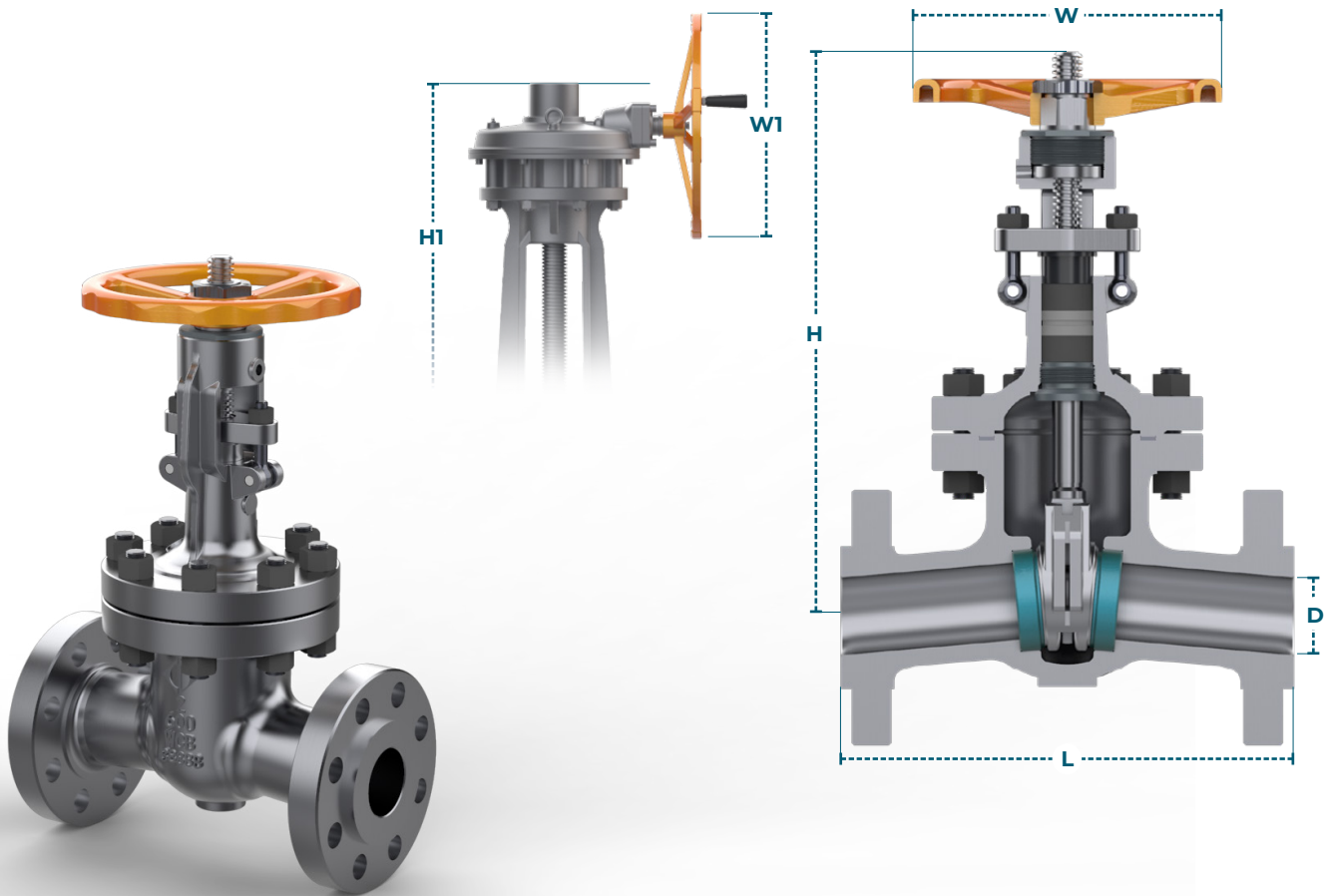
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# API 600 GATE VALVE

ASME Class 600 & 900

Dimensional Information



CL. 600	DIMENSIONS (INCH)							WEIGHT (LBS)		
	L			D	H	H1	W	W1	HW	GO
SIZE	RF	RTJ	BW							
2	11.5	11.6	11.5	2.0	17.5	-	7.9	-	71	-
2 1/2	13.0	13.1	13.0	2.5	19.7	-	9.8	-	115	-
3	14.0	14.1	14.0	3.0	22.0	23.0	11.0	11.8	132	192
4	17.0	17.1	17.0	4.0	26.2	27.4	11.8	11.8	236	295
6	22.0	22.1	22.0	6.0	34.2	35.4	17.7	11.8	476	591
8	26.0	26.1	26.0	8.0	42.2	43.7	19.7	17.7	880	994
10	31.0	31.1	31.0	10.0	49.7	51.2	25.6	17.7	1334	1449
12	33.0	33.1	33.0	12.0	63.0	65.0	27.6	19.7	1876	1969
14	35.0	35.1	35.0	13.3	66.6	68.9	35.4	19.7	2595	2717
16	39.0	39.1	39.0	15.2	72.2	74.8	35.4	19.7	3336	3457
18	43.0	43.1	43.0	17.2	-	79.5	-	23.6	-	4366
20	47.0	47.2	47.0	19.3	-	85.5	-	23.6	-	5954
24	55.0	55.4	55.0	23.3	-	104.3	-	23.6	-	8820

CL. 900	DIMENSIONS (INCH)							WEIGHT (LBS)		
	L			D	H	H1	W	W1	HW	GO
SIZE	RF	RTJ	BW							
2	14.5	14.6	14.5	2.0	18.0	-	11.0	-	154	-
2 1/2	16.5	16.6	16.5	2.4	21.7	-	11.0	-	243	-
3	15.0	15.1	15.0	2.9	24.0	26.0	11.8	11.8	309	368
4	18.0	18.1	18.0	3.9	27.6	29.5	13.8	11.8	441	501
6	24.0	24.1	24.0	5.9	38.6	41.7	19.7	17.7	789	904
8	29.0	29.1	29.0	7.9	43.3	44.9	25.6	17.7	1213	1323
10	33.0	33.1	33.0	9.9	52.0	53.9	27.6	19.7	2205	2426
12	38.0	38.1	38.0	11.9	59.1	61.4	35.4	19.7	2679	2889
14	40.5	40.9	40.5	12.7	74.8	72.8	35.4	23.6	3528	3749
16	44.5	44.9	44.5	14.7	80.7	76.8	35.4	23.6	4741	5138
18	48.0	48.5	48.0	16.7	-	81.9	-	23.6	-	5954
20	52.0	52.5	52.0	18.5	-	90.6	-	23.6	-	7828
24	61.0	61.7	61.0	22.4	-	102.4	-	23.6	-	13451

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# API 623 GLOBE VALVE

ASME Class 150, 300, 600, 900

## Design Features

*Chaoda's API 623 design globe valves feature a robust design that has been optimized for use in refinery, petrochemical and chemical plant applications.*

<b>Basic Design</b>	API 623
<b>Testing</b>	API 598
<b>End Dimension</b>	
<i>Flanged</i>	ASME B16.5
<i>Butt Weld</i>	ASME B16.25
<b>Face-to-Face:</b>	ASME B16.10
<b>P/T Ratings:</b>	ASME B16.34



## HIGHLIGHTED FEATURES

### 1) Bolted Bonnet Design

### 2) Backseat Design

All cast globe valves are equipped standard with a backseat to allow for sealing in case of packing leakage.

### 3) Seat Design

Cast carbon steel globe valves are equipped standard with a seat ring that is welded into the body. Cast stainless steel globe valves are equipped standard with an integral seat. Seat and/or disc surfaces can be hardfaced with CoCr-A or other hardfacing overlays.

### 4) Stem Design

Stems are integral 1-piece forged design. Stems are designed to fail outside the pressure boundary.

### 5) Operation

Globe valves are equipped standard with handwheels or gear operators depending on size and customer requirement.

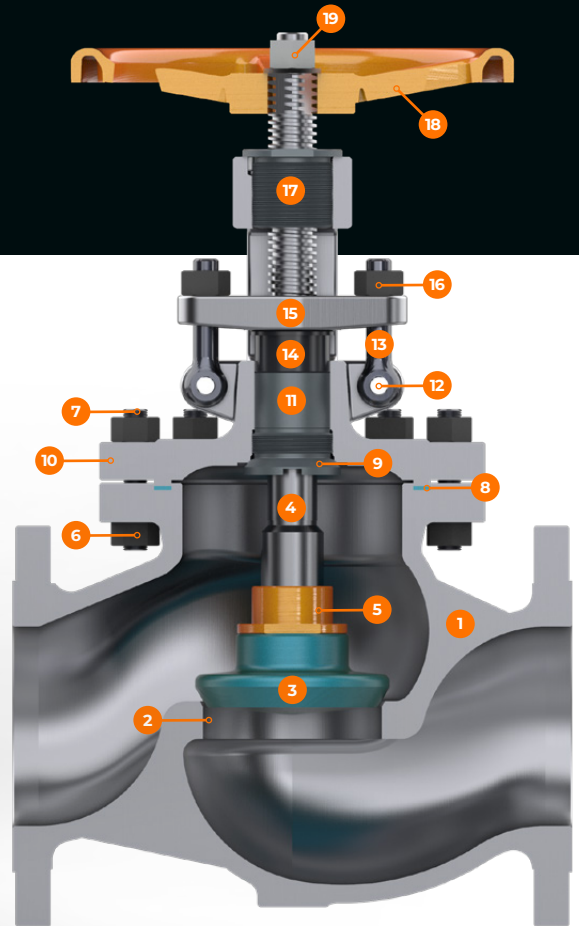
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# API 623 GLOBE VALVE

ASME Class 150, 300, 600, 900

Standard Parts and Materials



ITEM	PART NAME	WCB API TRIM 8	LCC API TRIM 12	C5 API TRIM 5	CF8M API TRIM 12	CD3MN 1/2 HARDFACE TRIM
1	Body	ASTM A216 WCB	ASTM A352 LCC	ASTM A217 C5	ASTM A351 CF8M	ASTM A890 GR. 4A
2	Seat Ring	ASTM A105 + HF*	ASTM A350 LF2 + HF*	ASTM A182 F5 + HF*	Integral + HF*	Integral + HF*
3	Disc	ASTM A105 + 13%Cr	ASTM A350 LF2 + 316SS	ASTM A182 F5 + HF*	ASTM A182 F316	ASTM A182 F51
4	Stem	ASTM A182 F6a	ASTM A182 F316	ASTM A182 F6a	ASTM A182 F316	ASTM A182 F51
5	Disc Nut	ASTM A182 F6a	ASTM A182 F316	ASTM A182 F6a	ASTM A182 F316	ASTM A182 F51
6	Bonnet Nut***	ASTM A194 2H	ASTM A194 7	ASTM A194 4	ASTM A194 8M	ASTM A194 8M
7	Bonnet Stud***	ASTM A193 B7	ASTM A320 L7	ASTM A193 B16	ASTM A193 B8M	ASTM A193 B8M
8	Gasket Class 150-600 Gasket Class 900	Spiralwound 304SS + Graphite RTJ 316SS	Spiralwound 304SS + Graphite RTJ 316SS	Spiralwound 304SS + Graphite RTJ 316SS	Spiralwound 316SS + Graphite RTJ 316SS	Spiralwound S31803 + Graphite RTJ S31803
9	Backseat Bushing	ASTM A182 F6a	ASTM A182 F316	ASTM A182 F6a	Integral	Integral
10	Bonnet	ASTM A216 WCB	ASTM A352 LCC	ASTM A217 C5	ASTM A351 CF8M	ASTM A995 CD3MN
11	Packing			Graphite		
12	Eyebolt Pin			ASTM A36		
13	Gland Eyebolt	ASTM A193 B7	ASTM A320 L7	ASTM A193 B16	ASTM A193 B8M	ASTM A193 B8M
14	Gland	ASTM A182 F6a	ASTM A182 F304	ASTM A182 F304	ASTM A182 F316	ASTM A182 F51
15	Glange Flange	ASTM A216 WCB	ASTM A352 LCC	ASTM A217 C5	ASTM A351 CF8M	ASTM A351 CF8
16	Eyebolt Nut	ASTM A194 2H	ASTM A194 7	ASTM A194 4	ASTM A194 8M	ASTM A194 8M
17	Stem Nut	ASTM B148 C95200	ASTM B148 C95200	ASTM B148 C95200	ASTM B148 C95200	ASTM B148 C95200
18	Handwheel			CS		
19	Handwheel Nut			CS (ASTM 1035)		

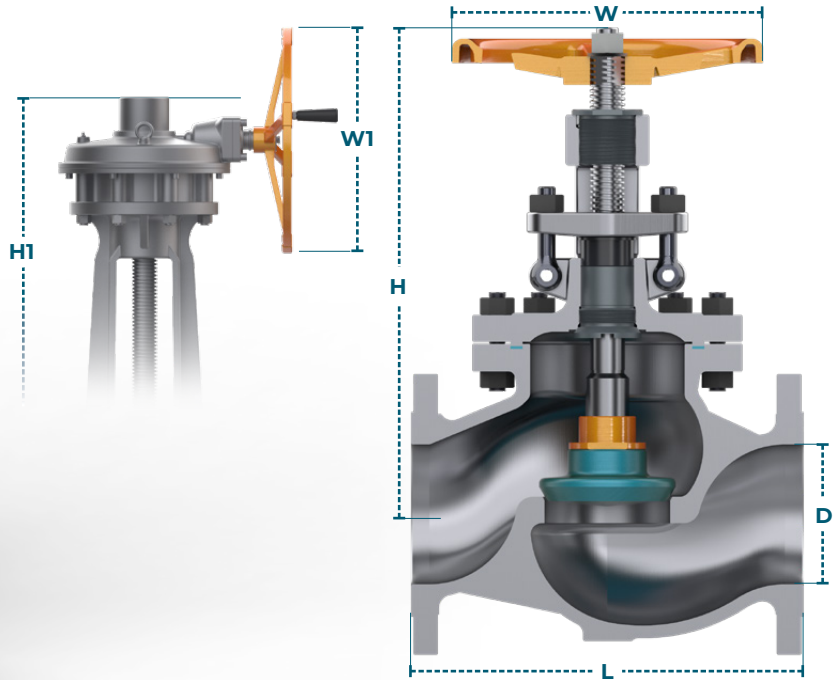
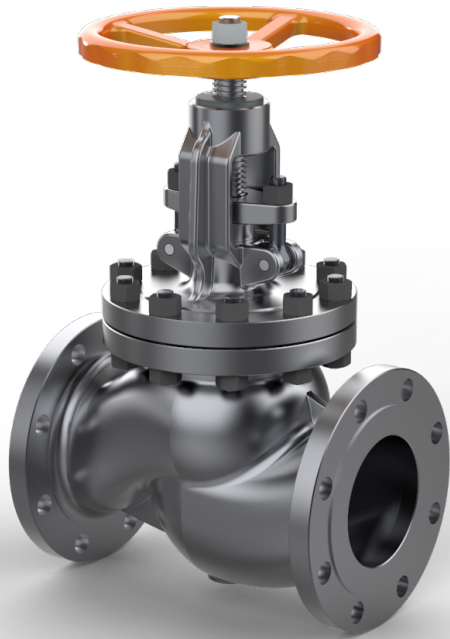
\* - HF Denotes CoCr-A hardfacing applied to sealing surface (Stellite® 6 or equivalent) | \*\* - Seat Ring if equipped is seal-welded into valve body  
 \*\*\* - If NACE compliance for exposed service is required, carbon steel valves can be supplied with appropriate bolting (WCB - B7M/2HM, LCC - L7M/7M)

Note: All information contained in this catalog is subject to change without notice.

# API 623 GLOBE VALVE

ASME Class 150, 300, 600, & 900

Dimensional Information



CL. 150	DIMENSIONS (INCH)								WEIGHT (LBS)	
	L			D	H	H1	W	W1	HW	GO
	RF	RTJ	BW							
2	8.0	8.5	8.0	2.0	13.0	-	7.9	-	42	-
2 1/2	8.5	9.0	8.5	2.5	14.2	-	9.8	-	60	-
3	9.5	10.0	9.5	3.0	15.4	-	11.0	-	79	-
4	11.5	12.0	11.5	4.0	17.5	-	11.8	-	117	-
6	16.0	16.5	16.0	6.0	20.5	21.9	13.8	11.8	207	278
8	19.5	20.0	19.5	8.0	23.6	25.9	17.7	11.8	326	397
10	24.5	25.0	24.5	10.0	30.4	31.7	17.7	17.7	534	642
12	27.5	28.0	27.5	11.9	-	41.6	-	19.7	-	1058
14	31.0	31.5	31.0	13.2	-	45.0	-	18.1	-	1588
16	36.0	36.5	36.0	15.2	-	48.3	-	18.1	-	2315
18	38.5	39.0	38.5	17.2	-	51.7	-	18.1	-	3043

CL. 300	DIMENSIONS (INCH)								WEIGHT (LBS)	
	L			D	H	H1	W	W1	HW	GO
	RF	RTJ	BW							
2	10.5	11.1	10.5	2.0	15.2	-	7.9	-	55	-
2 1/2	11.5	12.1	11.5	2.5	16.5	-	7.9	-	93	-
3	12.5	13.1	12.5	3.0	17.3	-	11.0	-	101	-
4	14.0	14.6	14.0	4.0	20.3	-	13.8	-	163	-
6	17.5	18.1	17.5	6.0	26.0	27.2	15.7	12.2	364	430
8	22.0	22.6	22.0	8.0	35.4	37.4	21.7	18.1	606	721
10	24.5	25.1	24.5	10.0	37.4	39.0	23.6	18.1	882	997
12	28.0	28.6	28.0	12.0	40.6	42.5	27.6	18.1	1376	1599

CL. 600	DIMENSIONS (INCH)								WEIGHT (LBS)	
	L			D	H	H1	W	W1	HW	GO
	RF	RTJ	BW							
2	11.5	11.6	11.5	2.0	14.3	-	9.8	-	71	-
2 1/2	13.0	13.1	13.0	2.5	16.2	-	11.0	-	93	-
3	14.0	14.1	14.0	3.0	18.4	-	15.7	-	139	-
4	17.0	17.1	17.0	4.0	20.9	25.0	17.7	17.7	236	304
6	22.0	22.1	22.0	6.0	30.8	29.7	23.6	17.7	639	754
8	26.0	26.1	26.0	7.9	36.1	34.6	25.6	19.7	1191	1422

CL. 900	DIMENSIONS (INCH)								WEIGHT (LBS)	
	L			D	H	H1	W	W1	HW	GO
	RF	RTJ	BW							
2	14.5	14.6	14.5	2.0	21.7	-	13.8	-	121	-
2 1/2	16.5	16.6	16.5	2.5	22.0	-	13.8	-	150	-
3	15.0	15.1	15.0	3.0	22.2	21.3	15.7	11.8	209	282
4	18.0	18.1	18.0	4.0	27.0	28.3	17.7	17.7	353	463
6	24.0	24.1	24.0	6.0	37.4	40.0	25.6	19.7	904	1058

Note: All information contained in this catalog is subject to change without notice.



# API 594 SWING CHECK VALVE

ASME Class 150, 300, 600, 900

## Design Features

Chaoda's API 594 design swing check valves feature a robust design that has been optimized for use in refinery, petrochemical and chemical plant applications.

<b>Basic Design</b>	API 594
<b>Testing</b>	API 598
<b>End Dimension</b>	
<i>Flanged</i>	ASME B16.5
<i>Butt Weld</i>	ASME B16.25
<b>Face-to-Face:</b>	ASME B16.10
<b>P/T Ratings:</b>	ASME B16.34



## HIGHLIGHTED FEATURES

### 1) Bolted Bonnet Design

### 2) Internally-Retained Hinge Pin

All swing check valves are equipped standard with internally-retained hinge pins to eliminate a potential leak path and comply to API 594 requirements.

### 3) Disc Design

All swing check discs are equipped standard with an anti-rotation feature that prevents the disc from rotating more than 360 degrees.

### 4) Seat Design

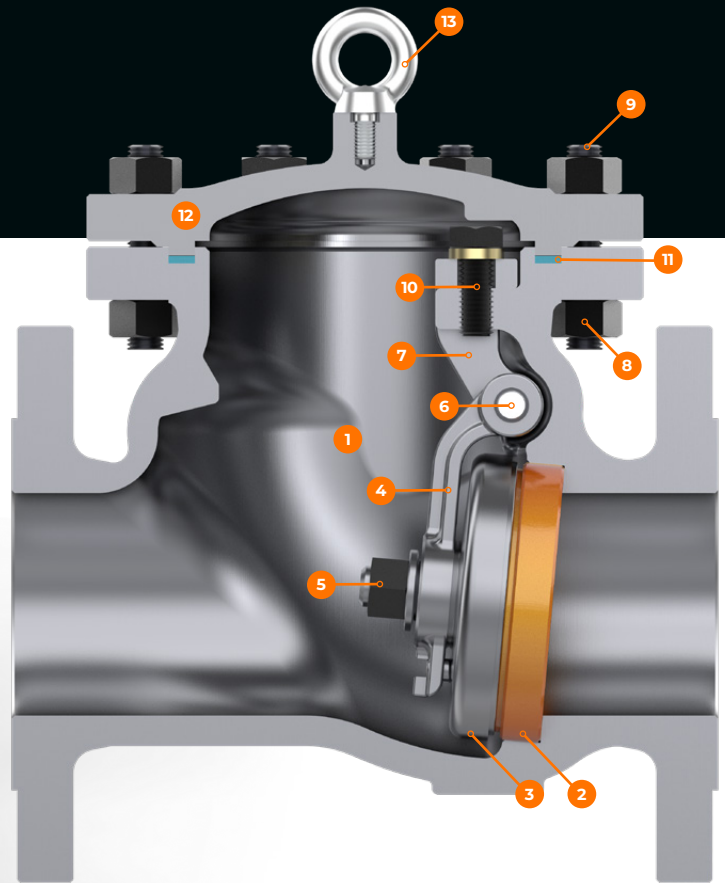
Cast carbon steel swing check valves are equipped standard with seal-welded seat ring. Cast stainless steel swing check valves are equipped standard with integral seats. Seat and/or disc surfaces can be hardfaced with CoCr-A or other hardfacing overlays.

Note: All information contained in this catalog is subject to change without notice.

# API 594 SWING CHECK VALVE

ASME Class 150, 300, 600, 900

Standard Parts and Materials



ITEM	PART NAME	WCB API TRIM 8	LCC API TRIM 12	C5 API TRIM 5	CF8M API TRIM 12	CD3MN 1/2 HARDFACE TRIM
1	Body	ASTM A216 WCB	ASTM A352 LCC	ASTM A217 C5	ASTM A351 CF8M	ASTM A995 CD3MN
2	Seat Ring	ASTM A105 + HF*	ASTM A350 LF2 + HF*	ASTM A182 F5 + HF*	Integral + HF*	Integral + HF*
3	Disc	ASTM A216 WCB + 13%Cr	ASTM A352 LCC + 316SS	ASTM A217 C5 + HF*	ASTM A351 CF8M	ASTM A995 CD3MN
4	Arm	ASTM A216 WCB	ASTM A352 LCC	ASTM A217 C5	ASTM A351 CF8M	ASTM A995 CD3MN
5	Disc Nut	ASTM A194 2H	ASTM A194 7	ASTM A194 4	ASTM A194 8M	ASTM A194 8M
6	Hinge Pin	A276 410	A276 316	A276 410	ASTM A276 316	UNS S31803
7	Yoke	ASTM A216 WCB	ASTM A352 LCC	ASTM A217 C5	ASTM A351 CF8M	ASTM A995 CD3MN
8	Bonnet Nut	ASTM A194 2H	ASTM A194 7	ASTM A194 4	ASTM A194 8M	ASTM A194 8M
9	Bonnet Stud	ASTM A193 B7	ASTM A320 L7	ASTM A193 B16	ASTM A193 B8M	ASTM A193 B8M
10	Yoke Bolt	ASTM A193 B7	ASTM A320 L7	ASTM A193 B16	ASTM A193 B8M	ASTM A193 B8M
11	Gasket Class 150-600	Spiralwound 304SS + Graphite	Spiralwound 304SS + Graphite	Spiralwound 304SS + Graphite	Spiralwound 316SS + Graphite	Spiralwound S31803 + Graphite
	Gasket Class 900	RTJ 316SS	RTJ 316SS	RTJ 316SS	RTJ 316SS	RTJ S31803
12	Cover	ASTM A216 WCB	ASTM A352 LCC	ASTM A217 C5	ASTM A351 CF8M	ASTM A995 CD3MN
13	Eyebolt	ASTM 1025				

\* - HF Denotes CoCr-A hardfacing applied to sealing surface (Stellite® 6 or equivalent) | \*\* - Seat Ring if equipped is seal-welded into valve body  
 \*\*\* - If NACE compliance for exposed service is required, carbon steel valves can be supplied with appropriate bolting (WCB - B7M/2HM, LCC - L7M/7M)

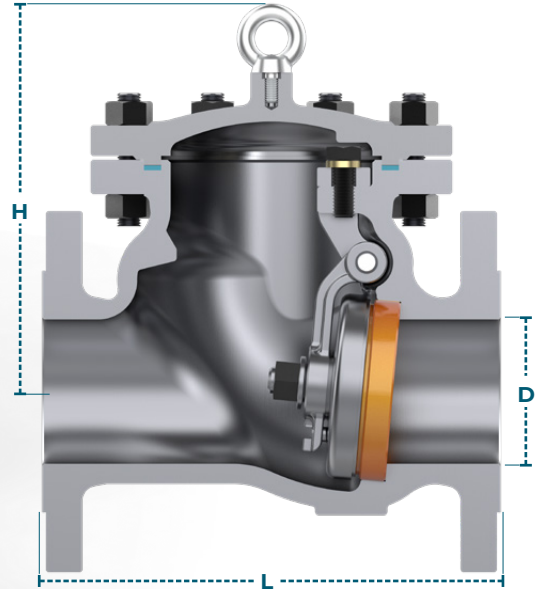
Note: All information contained in this catalog is subject to change without notice.



# API 594 SWING CHECK VALVE

ASME Class 150, 300, 600, & 900

Dimensional Information



CL. 150	DIMENSIONS (INCH)					WEIGHT (LBS)
	SIZE	L			D	
RF		RTJ	BW			
2	8	8.5	8	2	5.2	33
2.5	8.5	9	8.5	2.5	5.8	44
3	9.5	10	9.5	3	6.9	60
4	11.5	12	11.5	4	7.8	99
6	14	14.5	14	6	12.6	152
8	19.5	20	19.5	8	15	289
10	24.5	25	24.5	10	17.3	483
12	27.5	28	27.5	12	18.9	708
14	31	31.5	31	13.3	20.9	838
16	34	34.5	34	15.2	22.8	1235
18	38.5	39	38.5	17.2	24.3	1389
20	38.5	39	38.5	19.3	25.9	1698
24	51	51.5	51	23.3	29.9	2117

CL. 300	DIMENSIONS (INCH)					WEIGHT (LBS)
	SIZE	L			D	
RF		RTJ	BW			
2	10.5	11.1	10.5	2	5.7	44
2.5	11.5	12.1	11.5	2.5	6.7	77
3	12.5	13.1	12.5	3	8.3	88
4	14	14.6	14	4	10.2	135
6	17.5	18.1	17.5	6	12.8	287
8	21	21.6	21	8	15	419
10	24.5	25.1	24.5	10	17.3	653
12	28	28.6	28	12	20.5	992
14	33	33.6	33	13.3	21.3	1411
16	34	34.6	34	15.2	23.1	1874
18	38.5	39.1	38.5	17.2	26.4	2271
20	40	40.7	40	19.3	28.3	2933
24	53	53.9	53	23.3	33.5	4300

CL. 600	DIMENSIONS (INCH)					WEIGHT (LBS)
	SIZE	L			D	
RF		RTJ	BW			
2	11.5	11.6	11.5	2	6.7	62
2.5	13	13.1	13	2.5	7	88
3	14	14.1	14	3	9.7	150
4	17	17.1	17	4	11.4	258
6	22	22.1	22	6	14.2	423
8	26	26.1	26	8	16.9	750
10	31	31.1	31	10	19.8	1136
12	33	33.1	33	12	21.8	1654
14	35	35.1	35	13.3	23.4	1962
16	39	39.1	39	15.2	26.8	2873
18	43	43.1	43	17.2	30.6	3969
20	47	47.2	47	19.3	38.2	4741
24	55	55.4	55	23.3	43.3	7056

CL. 900	DIMENSIONS (INCH)					WEIGHT (LBS)
	SIZE	L			D	
RF		RTJ	BW			
2	14.5	14.6	14.5	2	7.9	106
2.5	16.5	16.6	16.5	2.5	8.7	165
3	15	15.1	15	3	11	209
4	18	18.1	18	4	12.6	298
6	24	24.1	24	6	15.7	582
8	29	29.1	29	8	18.9	935
10	33	33.1	33	10	22	1610
12	38	38.1	38	12	24.9	2359
14	40.5	40.9	40.5	12.7	26.8	2602
16	44.5	44.9	44.5	14.7	30.7	3947
18	48	48.5	48	16.7	34.6	5513
20	52	52.5	52	18.5	41.3	6791
24	61	61.7	61	20.6	47.2	10143

Note: All information contained in this catalog is subject to change without notice.

# PRESSURE – TEMPERATURE RATINGS

## ASME B16.34 Valves

The following pressure temperature ratings are based on ASME B16.34 (2020 Edition). The temperatures shown are that of the pressure-containing shell, which is considered to be the same temperature as that of the fluid flowing within it.

Special consideration should be given to items such as trim, bonnet gasket material, and packing to assure that the rating is merited in all respects.

### ASME CLASS 150 - MAXIMUM ALLOWABLE NON-SHOCK PRESSURE (PSIG)

SERVICE TEMP °F	A216 GR. WCB GROUP 1.1 (A)	A352 GR. LCC GROUP 1.2 (B)	A217 GR. WC6 GROUP 1.9 (C), (D), (E)	A217 GR. C5 GROUP 1.13 (C), (E)	A217 GR. C12 GROUP 1.14 (C), (E)	A351 GR. CF8M GROUP 2.2 (G)	A995 GR. CD3MN GROUP 2.8 (H)
-20 TO 100	285	290	290	290	290	275	290
200	260	260	260	260	260	235	260
300	230	230	230	230	230	215	230
400	200	200	200	200	200	195	200
500	170	170	170	170	170	170	170
600	140	140	140	140	140	140	140
650	125	125	125	125	125	125	-
700	110	-	110	110	110	110	-
750	95	-	95	95	95	95	-
800	80	-	80	80	80	80	-
850	65	-	65	65	65	65	-
900	50	-	50	50	50	50	-
950	35	-	35	35	35	35	-
1000	20	-	20	20	20	20	-
1050	-	-	20 (f)	20 (f)	20 (f)	20	-
1100	-	-	20 (f)	20 (f)	20 (f)	20 (f)	-
1150	-	-	-	20 (f)	20 (f)	20 (f)	-
1200	-	-	-	15 (f)	20 (f)	20 (f)	-
1250	-	-	-	-	-	20 (f)	-
1300	-	-	-	-	-	20 (f)	-
1350	-	-	-	-	-	20 (f)	-
1400	-	-	-	-	-	20 (f)	-
1450	-	-	-	-	-	20 (f)	-
1500	-	-	-	-	-	15 (f)	-

### ASME CLASS 300 - MAXIMUM ALLOWABLE NON-SHOCK PRESSURE (PSIG)

SERVICE TEMP °F	A216 GR. WCB GROUP 1.1 (A)	A352 GR. LCC GROUP 1.2 (B)	A217 GR. WC6 GROUP 1.9 (C), (D), (E)	A217 GR. C5 GROUP 1.13 (C), (E)	A217 GR. C12 GROUP 1.14 (C), (E)	A351 GR. CF8M GROUP 2.2 (G)	A995 GR. CD3MN GROUP 2.8 (H)
-20 TO 100	740	750	750	750	750	720	750
200	680	750	750	750	750	620	745
300	655	730	720	730	730	560	665
400	635	705	695	705	705	515	615
500	605	665	665	665	665	480	580
600	570	605	605	605	605	450	555
650	550	590	590	590	590	440	-
700	530	-	570	570	570	435	-
750	505	-	530	530	530	425	-
800	410	-	510	510	510	420	-
850	320	-	485	485	485	420	-
900	230	-	450	375	450	415	-
950	135	-	320	275	375	385	-
1000	85	-	215	200	255	365	-
1050	-	-	145	145	170	360	-
1100	-	-	95	100	115	305	-
1150	-	-	-	60	75	235	-
1200	-	-	-	35	50	185	-
1250	-	-	-	-	-	145	-
1300	-	-	-	-	-	115	-
1350	-	-	-	-	-	95	-
1400	-	-	-	-	-	75	-
1450	-	-	-	-	-	60	-
1500	-	-	-	-	-	40	-

#### ADDITIONAL NOTES FOR P/T CHARTS

**(a)** Upon prolonged exposure to temperatures above 800°F, the carbide phase of steel may be converted to graphite. Permissible, but not recommended for prolonged use above 800°F.

**(b)** Not to be used over 650°F

**(c)** Use normalized and tempered material only.

**(d)** Not to be used over 1,100°F.

**(e)** The deliberate addition of any element not listed in ASTM A217, Table 1 is prohibited, except that calcium (Ca) and manganese (Mn) may be added for deoxidation.

**(f)** Flanged-end valve ratings terminate at 1,000°F.

**(g)** At temperatures above 1,000°F, use only when the carbon content is 0.04% or higher.

**(h)** This steel may become brittle after service at moderately elevated temperatures. Not to be used over 600°F.

Note: All information contained in this catalog is subject to change without notice.



# PRESSURE – TEMPERATURE RATINGS

## ASME B16.34 Valves

### ASME CLASS 600 - MAXIMUM ALLOWABLE NON-SHOCK PRESSURE (PSIG)

SERVICE TEMP °F	A216 GR. WCB GROUP 1.1 (A)	A352 GR. LCC GROUP 1.2 (B)	A217 GR. WC6 GROUP 1.9 (C), (D), (E)	A217 GR. C5 GROUP 1.13 (C), (E)	A217 GR. C12 GROUP 1.14 (C), (E)	A351 GR. CF8M GROUP 2.2 (G)	A995 GR. CD3MN GROUP 2.8 (H)
-20 to 100	1,480	1,500	1,500	1,500	1,500	1,440	1,500
200	1,360	1,500	1,500	1,500	1,500	1,240	1,490
300	1,310	1,455	1,445	1,455	1,455	1,120	1,335
400	1,265	1,405	1,385	1,410	1,410	1,025	1,230
500	1,205	1,330	1,330	1,330	1,330	955	1,160
600	1,135	1,210	1,210	1,210	1,210	900	1,115
650	1,100	1,175	1,175	1,175	1,175	885	-
700	1,060	-	1,135	1,135	1,135	870	-
750	1,015	-	1,065	1,065	1,065	855	-
800	825	-	1,015	1,015	1,015	845	-
850	640	-	975	975	975	835	-
900	460	-	900	745	900	830	-
950	275	-	640	550	755	775	-
1000	170	-	430	400	505	725	-
1050	-	-	290	290	345	720	-
1100	-	-	190	200	225	610	-
1150	-	-	-	125	150	475	-
1200	-	-	-	70	105	370	-
1250	-	-	-	-	-	295	-
1300	-	-	-	-	-	235	-
1350	-	-	-	-	-	190	-
1400	-	-	-	-	-	150	-
1450	-	-	-	-	-	115	-
1500	-	-	-	-	-	85	-

### ASME CLASS 900 - MAXIMUM ALLOWABLE NON-SHOCK PRESSURE (PSIG)

SERVICE TEMP °F	A216 GR. WCB GROUP 1.1 (A)	A352 GR. LCC GROUP 1.2 (B)	A217 GR. WC6 GROUP 1.9 (C), (D), (E)	A217 GR. C5 GROUP 1.13 (C), (E)	A217 GR. C12 GROUP 1.14 (C), (E)	A351 GR. CF8M GROUP 2.2 (G)	A995 GR. CD3MN GROUP 2.8 (H)
-20 TO 100	2,220	2,250	2,250	2,250	2,250	2,160	2,250
200	2,035	2,250	2,250	2,250	2,250	1,860	2,230
300	1,965	2,185	2,165	2,185	2,185	1,680	2,000
400	1,900	2,110	2,080	2,115	2,115	1,540	1,845
500	1,810	1,995	1,995	1,995	1,995	1,435	1,740
600	1,705	1,815	1,815	1,815	1,815	1,355	1,670
650	1,650	1,765	1,765	1,765	1,765	1,325	-
700	1,590	-	1,705	1,705	1,705	1,305	-
750	1,520	-	1,595	1,595	1,595	1,280	-
800	1,235	-	1,525	1,525	1,525	1,265	-
850	955	-	1,460	1,460	1,460	1,255	-
900	690	-	1,350	1,120	1,350	1,245	-
950	410	-	955	825	1,130	1,160	-
1000	255	-	650	595	760	1,090	-
1050	-	-	430	430	515	1,080	-
1100	-	-	290	300	340	915	-
1150	-	-	-	185	225	710	-
1200	-	-	-	105	155	555	-
1250	-	-	-	-	-	440	-
1300	-	-	-	-	-	350	-
1350	-	-	-	-	-	290	-
1400	-	-	-	-	-	225	-
1450	-	-	-	-	-	175	-
1500	-	-	-	-	-	125	-

#### ADDITIONAL NOTES FOR P/T CHARTS

- (a) Upon prolonged exposure to temperatures above 800°F, the carbide phase of steel may be converted to graphite. Permissible, but not recommended for prolonged use above 800°F.
- (b) Not to be used over 650°F
- (c) Use normalized and tempered material only.
- (d) Not to be used over 1,100°F.

- (e) The deliberate addition of any element not listed in ASTM A217, Table 1 is prohibited, except that calcium (Ca) and manganese (Mn) may be added for deoxidation.
- (f) Flanged-end valve ratings terminate at 1,000°F.
- (g) At temperatures above 1,000°F, use only when the carbon content is 0.04% or higher.
- (h) This steel may become brittle after service at moderately elevated temperatures. Not to be used over 600°F.

Note: All information contained in this catalog is subject to change without notice.



# API 600 TRIM CHART

For Reference

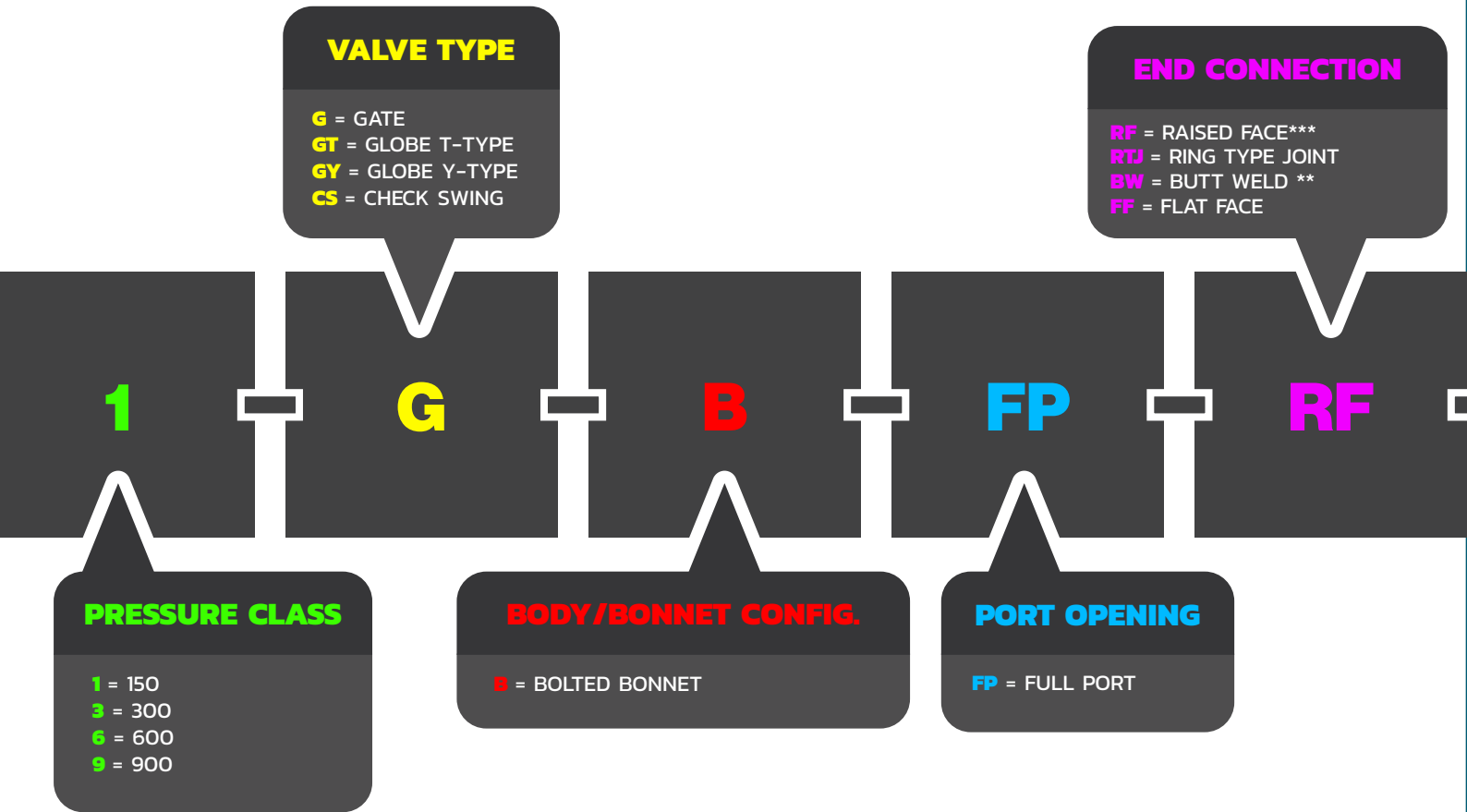
API TRIM NUMBER	NOMINAL TRIM	WEDGE / DISC SURFACE	SEATING SURFACE	STEM / BACKSEAT
3	F310	310SS	310SS	310SS
4	Hard F6	13%Cr	13%Cr	410SS
5	Hardfaced	HF (CoCr-A)	HF (CoCr-A)	410SS
5A	Hardfaced	HF (NiCr)	HF (NiCr)	410SS
6	F6 and Cu-Ni	13%Cr	Cu-Ni	410SS
7	F6 and Hard F6	13%Cr	Hard 13%Cr	410SS
8	F6 and Hardfaced	13%Cr	HF (CoCr-A)	410SS
8A	F6 and Hardfaced	13%Cr	HF (NiCr)	410SS
9	Monel®	Monel®	Monel®	Monel®
10	316	316SS	316SS	316SS
11	Monel® and Hardfaced	Monel®	HF (CoCr-A)	Monel®
12	316 and Hardfaced	316SS	HF (CoCr-A)	316SS
13	Alloy 20	Alloy 20	Alloy 20	Alloy 20
14	Alloy 20 and Hardfaced	Alloy 20	HF (CoCr-A)	Alloy 20
15	Hardfaced	HF (CoCr-A)	HF (CoCr-A)	304SS
16	Hardfaced	HF (CoCr-A)	HF (CoCr-A)	316SS
17	Hardfaced	HF (CoCr-A)	HF (CoCr-A)	347SS
18	Hardfaced	HF (CoCr-A)	HF (CoCr-A)	Alloy 20
19	Nickel	Ni Alloy	Ni Alloy	Ni Alloy
19A	Alloy 625	Inconel® 625	Inconel® 625	Inconel® 625
19B	Alloy C276	Hastelloy® C276	Hastelloy® C276	Hastelloy® C276
19C	Alloy 825	Incoloy® 825	Incoloy® 825	Incoloy® 825
20	Nickel and Hardfaced	Ni Alloy	HF (CoCr-A)	Ni Alloy
20A	Alloy 625 and Hardfaced	Inconel® 625	HF (CoCr-A)	Inconel® 625
20B	Alloy C276 and Hardfaced	Hastelloy® C276	HF (CoCr-A)	Hastelloy® C276
20C	Alloy 825 and Hardfaced	Incoloy® 825	HF (CoCr-A)	Incoloy® 825
21	Hardfaced	HF (CoCr-A)	HF (CoCr-A)	Ni Alloy

Note: All information contained in this catalog is subject to change without notice.



# VALVE FIGURE NUMBER SYSTEM

## How-To-Order Guide



## Figure Number

### 1-G-B-FP-RF-WCB-5-G-H

**EXAMPLE:** Class 150 Gate Valve Bolted Bonnet Raised Face WCB Body API Trim 5 Graphite Packing Handwheel Operated

This unique Valve Figure Number system is arranged to cover the basic valve design features.

When ordering, please include this basic Figure Number and add any additional design requirements and features in a complete valve description. Valve designs, materials, trims and other features are not limited to those listed here.

\*API Trims are as listed in API Standard 600, 13th Edition.

\*\* Customer to advise pipe schedule at time of PO.

\*\*\* Customer to advise end flange series (A or B) at time of PO for items larger than 24".

Note: All information contained in this catalog is subject to change without notice.



### STEM/GASKET SEAL

- G** = GRAPHITE
- P** = PTFE
- N** = N/A
- RJ** = RING GASKET

**WCB**

**5**

**G**

**H**

### BODY MATERIAL

- WCB** = CAST A216 WCB
- LCB** = CAST A352 LCB
- LCC** = CAST A352 LCC
- WC6** = CAST A217 WC6
- WC9** = CAST A217 WC9
- C5** = CAST A217 C5
- C12** = CAST A217 C12
- C12A** = CAST A217 C12A
- CF3** = CAST A351 CF3
- CF8** = CAST A351 CF8
- CF3M** = CAST A351 CF3M
- CF8M** = CAST A351 CF8M
- CN7M** = CAST A351 CN7M
- CD4MCU** = CAST A890 1A
- CD4MCUN** = CAST A890 1B
- CD3MCUN** = CAST A890 1C
- CD3MN** = CAST A890 4A
- CE3MN** = CAST A890 5A
- M** = MONEL®
- I800H** = INCOLOY® 800H
- HC** = CW12MW (HASTELLOY® C-276)

### METAL TRIM MATERIALS\*

- 1** = API TRIM 1
- 2** = API TRIM 2
- 5** = API TRIM 5
- 8** = API TRIM 8
- 9** = API TRIM 9
- 10** = API TRIM 10
- 12** = API TRIM 12
- 13** = API TRIM 13
- 15** = API TRIM 15
- 16** = API TRIM 16
- A** = F51/FHF
- B** = INCONEL® 625/HF
- C** = F51/F53
- D** = F51
- E** = F51/HF
- F** = F53
- G** = F53/HF
- H** = F53/FHF
- I** = F55/HF
- J** = ALLOY 926
- K** = F347H/HF
- L** = F347H/FHF

### OPERATION

- H** = HANDWHEEL
- G** = GEAR
- BS** = BARE STEM
- A** = ACTUATED
- N** = N/A

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 Hastelloy® is a registered trademark of Haynes International, Inc.  
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Note: All information contained in this catalog is subject to change without notice.



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