Gostaresh
Shir Sazi
Company

GSS valve

Manufacturer of different kinds
of valves for Petrochemical
Oil & Gas Industries

Catalogue 2014

Index

GSS
valve
company

Introduction

Our company takes pleasure in presenting our production of steel valves.

History

GSS with the aim of manufacturing different types of steel valves for Oil, Gas, Petrochemical Plants and power plants was established with the cooperation of petroleum Equipment Industrial Co. (P.E.I.C) and Energoinvest Company since 1995. This cooperation was based on transfer of know-how, technical aids and training courses from Energoinvest Experts in a period of 3 years.
GSS Co. has also signed an agreement with Douglas Chero company from Italy for production of forged valves.

Filed of activity

1. Design and manufacturing, assembly, production and sales and export of different type of industrial valves used in the Oil, Gas, Petrochemical and other industries as well as after sales services.

2. Control valve. All kind of trims (anticavitation, low noise, multistage pilot & etc.) are available. Top guided & cage guided design as well as balanced & unbalanced design could be used.

3. PVRC (Professional Valve Reconditioning Center), with confidence in its resources, started to recondition various types of metallic valves applied in Oil, Gas, Petrochemical and power industries, while observing international standards such as API, DIN, BS, ANSI/ASME and ISO.

Name Plate

Each valve is identified by proper marking on the nameplate according to MSS SP25 Specifications. Nameplate contains information regarding valve type, body-bonnet material, seat-wedge and stem composition, class and diameter.

Fig. No.

Ex.: 2 90 4

Type of valves

1 ► Gate valve, Solid Wedge
2 ► Gate valve, Flexible Wedge
3 ► Globe valve, Ball Type Disc
4 ► Swing CheckValve
5 ► Globe Valve, Plug Type Disc

Class Indication

15 ► Class 150
30 ► Class 300
60 ► Class 600
90 ► Class 900
150 ► Class 1500

Flanged End Type

1 ► Flanged End Rise Face
2 ► Smooth Finish
3 ► Butt Welding End
4 ► Flanged End Ring Joint

LOT

Ex.: B 4 3 G 80 05 4308

Valve Types

A ► Gate Valve
B ► Globe Valve
C ► Check Valve

Valve Classes

1 ► Class 150
2 ► Class 300
3 ► Class 600
4 ► Class 900
5 ► Class 1500

Valve Sizes

2 ► 2"
3 ► 3"
4 ► 4"
6 ► 6"
8 ► 8"
10 ► 10"
12 ► 12"
16 ► 16"

Trim Types

C ► C
S ► 5304, 5316
B ► C/HF
D ► C/Seat HF
M ► M
F ► M/Seat HF
G ► S316/Seat HF
L ► S316/HF
E ► M/HF
H ► HB
N ► C/M

Production Year

Iranian Calendar

Production Month

(Iranian Calendar)

Serial Number

Related to the manufacturing of that valve

Check valve

Gate valve

Globe valve

Products Collection

Control valve

Forged steel valve

Body - Bonnet Casting Materials

The following types of steels are common using in the valve industries.

Body-Bonnet Casting Materials

ASTM Specification	
A216 Gr. WCB	Many relatively non-corrosive fluids, at temperatures below approximately 800°F, including saturated and super - heated steam; cold or hot water; cold or hot air; and cold or hot non-corrosive oil, gas, and other fluids. The 0.30 percent maximum carbon content assures good welding properties. Consideration should be given to possibility of graphitization above approximately 800°F. It is permissible, but not recommended, by ASME B16.34 for prolonged usage above approximately 800°F. GSS recommended WCB steel for usage 775°F. and limits usage to 800°F because of graphitization.
A352 Gr. LCB*	Low temperature service down to -50°F. Its chemical composition is the same as for regular ASTM A216 Gr. WCB cast carbon steel, but it is especially heat treated in accordance with the ASTM material specification to retain its impact resistance at temperatures down to -50°F. Because of the special heat treatment, its strength is lower than regular WCB cast carbon steel. ASME B16.34 permits use from -50°F to 650°F.
A351 Gr. CF8	Corrosive resistance to many fluids. (ASME B 16.34 permits usage to 1000°F flanged end valves and usage to 1500°F for welding end valves only). ASME recommended to use steel with the combination of 0.04% carbon or more in temperature higher than 1000°F.
A351 Gr. CF8M	Greater resistance to pitting type of corrosion and higher resistance than ASTM A351 Gr. CF8 to general corrosion. (ASME B16.34 permits usage to 1000°F flanged end valves and usage to 1500°F for welding end valves only. ASME recommended to use steel with the combination of 0.04% carbon or more in temperature higher than 1000°F.
ASTM B148-C95800	The biggest resistance to corrosion. It is suitable for sea water and sewage.

* Alloy LCB is used for sub - zero service.

Chemical Composition For Body and Bonnet Materials

ASTM Specification	C %	Mn %	P %	S %	Si %	Ni %	Cr %	Mo %	Cu %	Other %
A216 Gr.WCB	0.3 Max.	1.00 Max.	0.04 Max.	0.045 Max.	0.60 Max.	0.50 Max.	0.50 Max.	0.20 Max	0.30 Max.	V 0.03 Max
A352 Gr.LCB	0.3 Max.	1.00 Max.	0.04 Max.	0.045 Max.	0.60 Max.	0.50 Max.	0.50 Max.	0.20 Max.	0.30 Max.	V 0.03 Max
A351 Gr.CF8	0.08 Max.	1.50 Max.	0.040 Max.	0.040 Max.	2.00 Max.	8.0 11.0	18.0 21.0	0.50 Max.	---	---
A351 Gr.CF8M	0.08 Max.	1.50 Max.	0.040 Max.	0.040 Max.	1.50 Max.	9.0 12.0	18.0 21.0	2.0 3.0	---	---
ASTM B148-C95800	---	1.2 Max	---	---	---	4.5 Max	---	---	81.3 Max	Al. 9.0 Max

Mechanical Properties For Body and Bonnet Casting Materials

ASTM Specification	Tensile Strength min Ksi (Mpa.)	Yeild point min Ksi (Mpa.)	Elongation in 2" or50mm%	Reduction of Area min%
A216 Gr.WCB	70-95 (485 - 655)	36 (250)	22	35
A352 Gr.LCB	65-90 (450 - 620)	35 (240)	24	35
A351 Gr.CF8	70 (485)	30 (205)	35	---
A351 Gr.CF8M	70 (485)	30 (205)	30	---

Trim Materials

The following tables suggest standard combination of trim (stem, disc, seat) composition. Different combinations are available upon request.

Trim Materials Chart

Standard Trim

Trim No. According to API 600	G.S.S Specification	Stem	Disc faces	Seat faces	Recommended for:
1	C	13Cr	13Cr	13Cr	oil and oil vapor services for temperature to 1000° F and for most corrosive and unrefined oils regardless of temperature.

Other Available Trims

2	S304	18Cr-8Ni	18Cr-8Ni	18Cr-8Ni	Corrosive fluids and temperature from 150° F to 1100° F
5	C/HF	13Cr	67Co-28Cr-4W	67Co-28Cr-4W	Steam, water gas, and other fluids above 850°F to 1100° F; the preceding oil and oil vapors in severe service (dirty fluid or frequent cycling) from -20° F to 110° F.
8	C/Seat HF	13Cr	13Cr	67Co-28Cr-4W	steam, water,gas and other relatively non- corrosive fluids in general up to 850° F; oil and oil vapor up to 1100° F
9	M	NiCu	NiCu	NiCu	Severe corrosive service, specially sea water, up to 850° F
10	S316	18Cr-10Ni-2Mo	18Cr-10Ni-2Mo	18Cr-10Ni-2Mo	Corrosive fluids and temperature from 150° F to 1500° F.
11	M/Seat HF	NiCu	NiCu	67Co-28Cr-4W	
12	S316/Seat HF	18Cr-10Ni-2Mo	18Cr-10Ni-2Mo	67Co-28Cr-4W	Moderately corrosive fluids (including oil) up to 850° F.
16	S316/HF	18Cr-10Ni-2Mo	67Co-28Cr-4W	67Co-28Cr-4W	
---	M/HF	NiCu	67Co-28Cr-4W	67Co-28Cr-4W	
---	HB	NiMo	NiMo	NiMo	The Hastelloy B alloys have low chromium and high (28%) molybdenum contents. Here the chromium level is too low permit the formation of a rotective chromium oxide film, so that these materials are not corrosion resistant in oxidizing environments. However the presence of molybdenum provides them with superior corrosion resistance in hydrochloric acid and very good resistance to many non oxidizing acids and most organic as well as non-oxidizing salts.
---	C/M	13Cr	NiCu	NiCu	

Chemical Composition Trim Materials

Trim	ASTM Specification	C %	Mn %	P %	S %	Si %	Ni %	Cr %	Mo %	Cu %	Co %	Other %
F6	A182 Gr.F6a	0.15 Max.	1.00 Max.	0.040 Max.	0.030 Max.	1.00 Max.	0.50 Max.	11.5 13.5	---	---	---	---
304	A182 Gr.304	0.08 Max.	2.00 Max.	0.045 Max.	0.030 Max.	1.00 Max	8.00 11.0	18.0 20.0	---	---	---	---
316	A182Gr.316	0.08 Max.	2.00 Max.	0.045 Max.	0.030 Max.	1.00 Max	10.0 14.0	16.0 18.0	2.00 3.00	---	---	---
M	B 164 Alloy 400	0.3 Max.	2.00 Max.	---	0.024 Max.	0.5 Max.	63.0 Min	---	---	28.0 34.0	---	Fe: 2.5 Max.
HF	Stellite Gr.6	1.00 Max.	1.00 Max.	---	---	1.00 Max.	3.00 Max.	28.00 Max.	---	---	BaL.	Fe:3.0 Max. W:4.0
HB	B366	0.1	0.80	---	---	0.7	BaL.	0.60	28.0	---	1.25	V: 0.3 Fe: 5.50

Bolting Materials

ASTM Specification	Bolting is always of alloy steels.
A193 Gr. B7	ASTM A193 Grade B7 bolting material is a chromium-molybdenum alloy steel with a minimum tensile strength of 125000 psi for sizes up to 2 ½ inch diameter.It retains its strength and resists creep at elevated temperatures. The quench and draw heat treatment gives a dense, uniform, fine grain; and high physical properties. These bolts are filled with ASTM A194 Gr. 2H hardened medium carbon steel nut with a hardness of 248 to 352 BHN.These nuts are capable of developing the full strength of the bolts. This alloy steel bolting is used for body-bonnet joints of carbon and low alloy steel body valves.
Other available Body-Bonnet Bolting Materials.	
A193 Gr. B8	ASTM A193 Gr. B8 bolting material is a chromium nickel alloy steel with a minimum tensile strength of 125000 psi for sizes up to ¾ inch diameter. Corrosion resistance of this steel especially in acidic environment is very good.These bolts are fitted with ASTM A194 Gr. 8. This alloy steel is used for body-bonnet joints of stainless steel body valves. (On request)
A320 Gr. L7	These bolts are fitted with ASTM A194 Gr. 4. This alloy steel bolting is used for body-bonnet joints of carbon steel and suitable for low temperature service down to -50° F.

Chemical Composition Bolting Materials

ASTM Specification	C %	Mn %	P %	S %	Si %	Ni %	Cr %	Mo %	Other
A182 Gr. B7	0.49 0.37	0.65 1.10	0.035 Max.	0.04 Max.	0.15 0.35	---	0.75 1.20	0.15 0.25	---
A193 Gr. B8	0.08 Max.	2.00 Max.	0.045 Max.	0.030 Max.	1.00 Max	8.00 11.0	18.0 20.0	---	---
A320 Gr. L7	0.38 0.48	0.75 1.00	0.035 Max.	0.040 Max.	0.15 0.35	---	0.80 1.10	0.15 0.25	---
A194 Gr. 2H	0.40 Min.	1.00 Max.	0.040 Max.	0.05 Max.	0.40 Max.	---	---	---	---
A194 Gr. 8	0.08 Max.	2.00 Max.	0.045 Max.	0.030 Max.	1.00 Max.	8.00 10.5	18.0 20.0	---	---
A194 Gr. 4	0.40 0.50	0.70 0.90	0.035 Max.	0.040 Max.	0.15 0.35	---	---	0.20 0.30	---

Optional Flange Gasket Materials

Depending on the service conditions, various materials are available optionally for bonnet cover flange gasket.

Gasket Materials
Asbestos joint sheet
Soft iron gasket
Spiral wound metal, asbestos filled
Spiral wound metal, graphite filled
Ring joint metal
Corrugated metal
Flexible graphite (grafoil*)
Virgin PTFE
Glass filled PTFE

Optional Gland Packing Materials

Depending on the service conditions, various materials are available optionally for gland packings.

Packing Materials	Service Conditions
PTFE impregnated asbestos	450° F corrosion resistant
Inconel wire asbestos	1200° F heat resistance
Virgin PTFE	450° F corrosion resistant
Graphite asbestos	650° F corrosion resistant
Flexible graphite (grafoil)	1500° F heat and corrosion resistant

* Grafoil is a registered trademark of Union Carbide Corp.

Bill of Materials

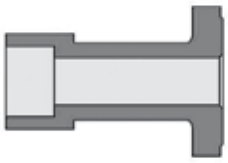
"Part No."	Part Name	Material												
		"Carbon Steel ASTM A216" *			"High Temperature Service ASTM A217"			"Stainless Steel ASTM A351"				"Low Temperature Service ASTM A352"		"High Resistance Service Including Sea Warter & Sewage ASTM B148"
		WCA	WCB	WCC	WC6	WC9	C5	CF3	CF3M	CF8	CF8M	LCB	LCC	C95800
1	Body	A216-WCA	A216-WCB	A216-WCC	A217-WC6	A217-WC9	A217-C5	A351-CF3	A351-CF3M	A352-CF8	A352-CF8M	A352-LCB	A352-LCC	B148-C95800
2	Seat Ring	C.S. A105			SS 304 or SS 316			SS 304 or SS 316				C.S. LF2		C95800
	Seat Ring Surface	13% Cr, HF(Stellite), 304, 316, Monel, Hastelloy B (Based on Trim Material Chart)												Alu-Br
3	Disc	A216-WCA	A216-WCB	A216-WCC	A217-WC6	A217-WC9	A217-C5	A351-CF3	A351-CF3M	A352-CF8	A352-CF8M	A352-LCB	A352-LCC	C95800
	Disc/Wedge Surface	13% Cr, HF,(Stellite), 304, 316, Monel, Hastelloy B (Based on Trim Material Chart)												Alu-Br
4	"Stem for Gate & Globe"	13% Cr, HF(Stellite), 304, 316, Monel, Hastelloy B (Based on Trim Material Chart)												C95200
5	Bonnet Gasket	Caf, Graphite + SS 304, Ring Joint												C.A.F, Graphite + SS 304
6	Bonnet / Cap	A216-WCA	A216-WCB	A216-WCC	A217-WC6	A217-WC9	A217-C5	A351-CF3	A351-CF3M	A352-CF8	A352-CF8M	A352-LCB	A352-LCC	B148-C95800
7	Bolts	A913-B7			A193-B16			A913-B8				A320-L7		A913-B7
8	Nuts	A914-2H			A194-7			A194-8				A194-4		A914-2H
9	Backseat Bushing	13% Cr, HF(Stellite), 304, 316, Monel, Hastelloy B (Based on Trim Material Chart)												C95200
10	"Stem Packing for Gate & Globe"	Reinforced Graphite & Die Formed Graphite Ring, PTFE												
11	Gland	13%Cr, 304, 316 (Based on Trim Material Chart)												C95200
12	Handwheel	Ductil Iron												

* The NACE material also is available

Connection Types

Threaded End

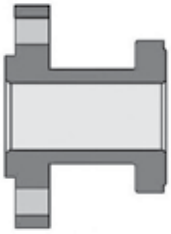
Socket Weld End



Extended Socket Weld End

Butt Weld End

Extended Butt Weld End



Flanged Class 600 lb.

Exclusive Design Features

General Description
Our valves are normally available in ASME 150, 300, 600, 900, and 1500 psi. Pressure ratings. Ample proportions and sturdy construction assure strength, durability, mechanical strength and safe weld ability. Trim materials are chosen for high corrosion and erosion resistance and sound mechanical properties at design temperature.

Castings
Castings are made by the electric furnace process under rigid metallurgical supervision. They are subject to heat treatment, thoroughly inspected to ensure freedom from defects.

Body and Bonnet
Body and bonnet are of heavy construction for maximum safety, having wall thickness at all points greater than the minimum specified by its standard.

Bodies
Bodies are designed to provide streamline-flow through the valve to minimize pressure loss and reduce corrosive and erosive effects. Long tapered fillets between heavy and relatively lighter sections eliminate the danger of casting defects at these critical points. Integral guides in the body of gate valves are provided to fit lots in the disc with minimum clearance to ensure accurate guiding of the disc.
Standard face-to-face dimensions of class 150 gate valves do not permit the use of circular bonnet end; therefore the shape of the body and bonnet is oval. For all other valves the shape is circular. On request a condensing chamber (lantern ring) is provided in the bonnet between the gland packing in all valves class 300 psi and over.

Bonnet joint
150 Psi valves have plan face flanges with either soft iron gasket or high grade C. A. F gasket. The 300 and 600 psi valves are supplied with a male/female bonnet joint with soft iron gasket. Over 600 psi valves (and also 600 psi on request) have an octagonal ring type bonnet joint for maximum strength and pressure tightness.

Yoke
The yoke, (in some sizes of class 900 & 1500) when it is not integral with the bonnet, is machined and drilled to join the bonnet yoke flange, which locates the yoke in perfect alignment with the back seat bushing and the stem.

Stem Nut
The stem nut is made of ductile Ni-resist having, beside the other properties, a great heat resistance.

Stem
The stem has liberal thread engagement with the stem nut. The stems of all valves are of one piece construction and have a beveled shoulder machined to seat on the bonnet back seat when the valve is fully open. Stems for all valves are screwed with the ACME thread and have an integral end in the form of a button or tee head fitting into a slot in the top of the disc to provide flexibility between the stem and disc. Normally stems are made of 13% Cr, steel ASTM A276 type 410 or 420 having a rolled mirror finish.

Disc
Made of either solid trim material or carbon steel faced with trim metal welds. Flexible single wedge discs deflect slightly to conform to body seat. Construction assures pressure tightness, reduces sticking of disc in seat and reduces torque needed to operate valve. The disc of the gate valves is a solid wedge according to API 600 section 2.3.1. (a). Check valve disc is fastened securely to disc carrier by means of a lock nut and cutter pin. Disc free to rotate to avoid localized wear. Disc carrier is supported on a sturdy disc carrier hinge pin of excellent bearing qualities. All parts are accessible from the top for easy servicing.

Seat Ring
The seat ring for all valves are welded into the body. Normally the seat rings surface are made of 13% Cr but maybe supplied in any other material on request.

Stuffing Box
Stuffing box is wide and deep, to ensure a long packing life and pressure tightness. Flexible graphite (grafoil) packing is normally used. Valves of class 300 and over maybe have a lantern type stuffing box with a tapped connection for liquid or grease seal. All valves are repack able while under pressure, when fully open.

Gland
All valves have a two pieces ball type gland and gland flange that exert an even pressure on the packing, without binding the stem.

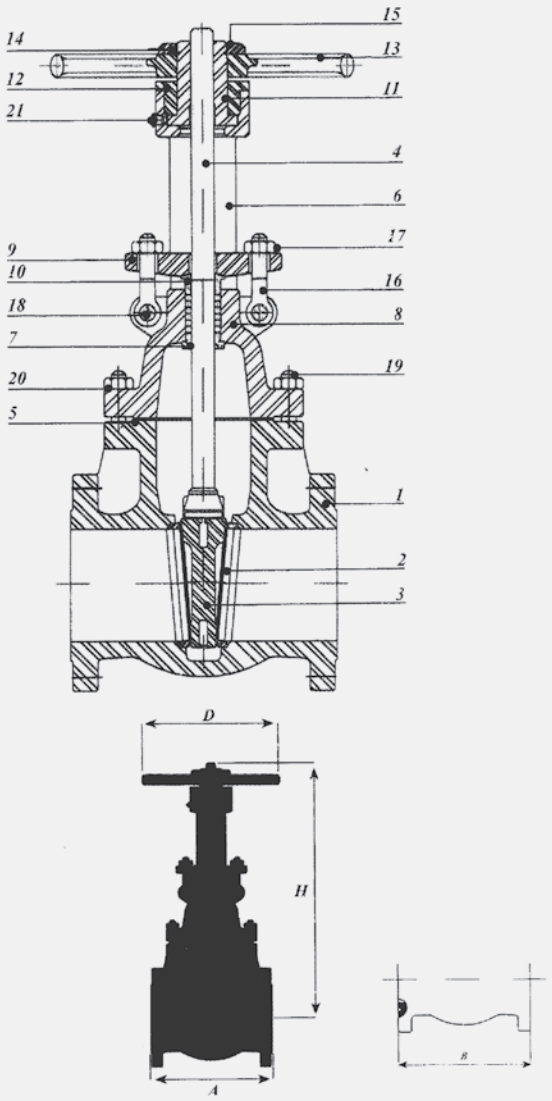
Bolting
Bolting is always of alloy steel and the grade of steel is determined by the service condition. All bolts and nuts are marked with material symbols.

Hand wheel
The hand wheel is normally made of cast iron ductile.

Locking device
Any valve attachment whose purpose is to prevent the operation of the valve by unauthorized persons.

Gate valve

Class150
Cast steel gate valve



Bolted Bonnet
Rising Stem
Outside Screw and Yoke
Solid Wedge Disk

Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr.WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020 / E410
3	Wedge	ASTM A216 Gr.WCB / E410 or ASTM A217 Gr. CA15
4	Stem	ASTM A276 Type 410 or 420
5	Gasket	Graphite
6	Bonnet	ASTM A216 Gr.WCB
7	Back Seat Bushing	ASTM A276 Type 410 or 420
8	Packing	Grafoil
9	Gland Flange	ASTM A105/ASTM A216 Gr. WCB
10	Gland	ASTM A276 Type 410
11	Stem Nut	ASTM A439 Type D2/D2C
12	Yoke Cap	ASTM A536 Gr. 65-45-12
13	Hand wheel	ASTM A47 Gr. 32510
14	Hand wheel Nut	ASTM A47 Gr. 32510
15	Spring Pin	Steel- DIN 914
16	Gland Eyebolt	ASTM A307 Gr.B
17	Gland Eyebolt Nut	ASTM A194 Gr. 2H
18	Groove Pin	ASTM A108 Gr.1040
19	Body-Bonnet Stud	ASTM A193 Gr. B7
20	Stud Nut	ASTM A194 Gr. 2H
21	Lubricator	Steel- DIN 71412

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

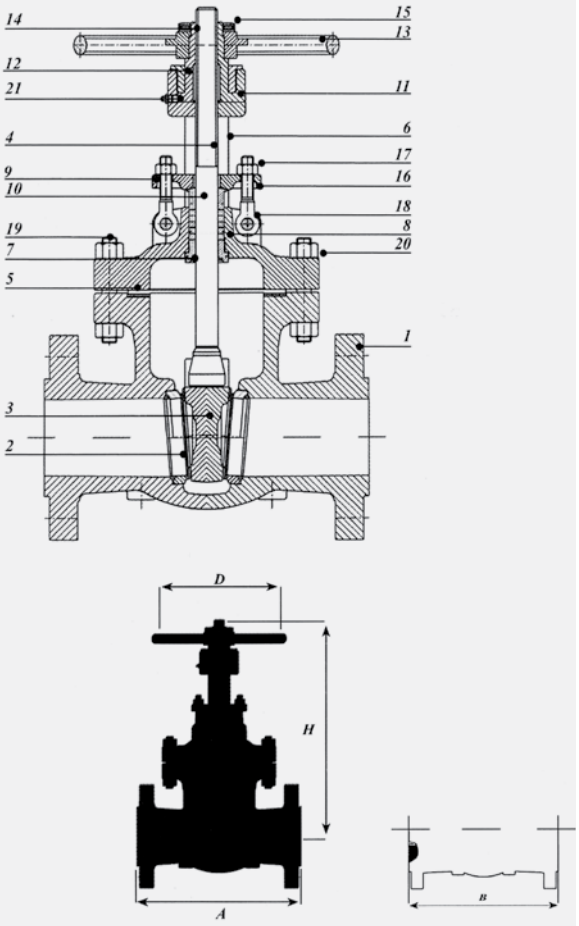
Main Dimensions and Weighs

NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	26	28	30	32	36	40	42	48
A (RF)	mm	178	190	203	229	254	267	292	330	356	381	406	432	457	508	559	610	610	660	711	813	813	864
A (BW)		216	241	283	305	381	403	419	457	502	572	610	660	711	813	864	914	914	965	1016	1067	1143	1397
B (RTJ)		190	203	216	241	267	279	305	343	368	394	419	444	470	521	-	-	-	-	-	-	-	-
H (Open)		410	451	502	599	665	790	967	1186	1405	1542	1728	1903	2114	2426	2688	2965	3097	3315	3633	4068	4236	4830
D		200	200	250	280	280	300	350	450	500	-	-	-	-	-	-	-	-	-	-	-	-	-
WT (RF)	kg	18	26	30	48	58	78	118	233	309	456	592	690	840	944	1850	2006	2370	3050	3500	4650	5100	6500
WT (BW)		15	23	28	40	52	68	101	216	281	421	546	636	754	842	1750	1897	2175	2820	3080	4290	4600	5800

Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test	Pneumatic Test
450 psi (31 bar - gage)	315 psi (21. 7 bar - gage)	80 psi (5.5 bar - gage)

Class300
Cast steel gate valve



Bolted Bonnet
Rising Stem
Outside Screw and Yoke
Solid Wedge Disk

Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr.WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020 / E410
3	Wedge	ASTM A216 Gr.WCB / E410 or ASTM A217 Gr. CA15
4	Stem	ASTM A276 Type 410 or 420
5	Gasket	Spiral Wound
6	Bonnet	ASTM A216 Gr.WCB
7	Back Seat Bushing	ASTM A276 Type 410 or 420
8	Packing	Grafoil
9	Gland Flange	ASTM A105/ASTM A216 Gr. WCB
10	Gland	ASTM A276 Type 410
11	Stem Nut	ASTM A439 Type D2/D2C
12	Yoke Cap	ASTM A536 Gr. 65-45-12
13	Hand wheel	ASTM A47 Gr. 32510
14	Hand wheel Nut	ASTM A47 Gr. 32510
15	Spring Pin	Steel- DIN 914
16	Gland Eyebolt	ASTM A307 Gr.B
17	Gland Eyebolt Nut	ASTM A194 Gr. 2H
18	Groove Pin	ASTM A108 Gr.1040
19	Body-Bonnet Stud	ASTM A193 Gr. B7
20	Stud Nut	ASTM A194 Gr. 2H
21	Lubricator	Steel- DIN 71412

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

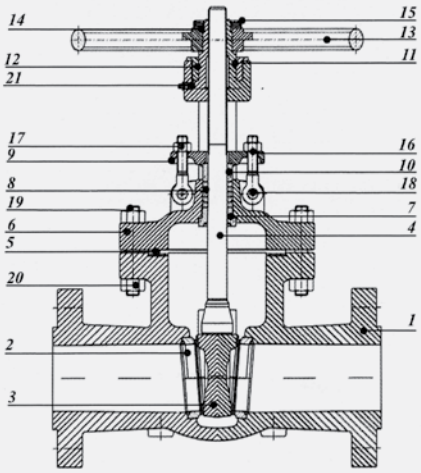
Main Dimensions and Weighs

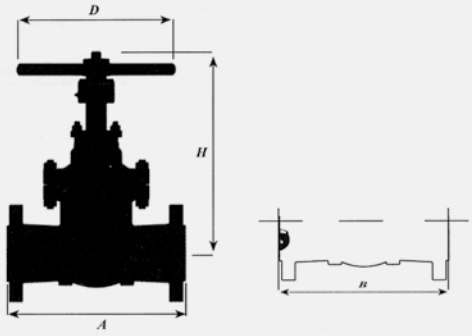
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	26	28	30	32	36	40	42	48
A (RF)	mm	216	241	283	305	381	403	419	457	502	762	838	914	991	1143	1245	1346	1397	1524	1727	1956	1981	2286
A (BW)		216	241	283	305	381	403	419	457	502	762	838	914	991	1143	1245	1346	1397	1524	1727	1956	1981	2286
B (RTJ)		232	257	298	321	397	419	435	473	518	778	854	930	1010	1165	1270	1372	1422	1552	1756	-	-	-
H (Open)		421	458	528	620	711	806	1037	1275	1438	1568	1767	1928	2126	2577	2731	3065	3277	3325	3702	4100	4320	4501
D		200	200	250	280	300	350	450	500	560	-	-	-	-	-	-	-	-	-	-	-	-	-
WT (RF)	kg	24	32	44	66	92	128	265	375	505	688	1095	1164	1488	2330	3000	4027	4570	4850	6632	8100	9750	13050
WT (BW)		20	27	38	56	80	110	226	325	407	600	938	990	1238	2020	2650	3600	4138	4235	5900	7500	8500	11200

Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test	Pneumatic Test
1125 psi (77.5 bar - gage)	815 psi (56.2 bar - gage)	80 psi (5.5 bar - gage)

Class600
Cast steel gate valve





Bolted Bonnet
Rising Stem
Outside Screw and Yoke
Solid Wedge Disk

Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr.WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020 / E410
3	Wedge	ASTM A216 Gr.WCB / E410 or ASTM A217 Gr. CA15
4	Stem	ASTM A276 Type 410 or 420
5	Gasket	Spiral Wound
6	Bonnet	ASTM A216 Gr.WCB
7	Back Seat Bushing	ASTM A276 Type 410 or 420
8	Packing	Grafoil
9	Gland Flange	ASTM A105/ASTM A216 Gr. WCB
10	Gland	ASTM A276 Type 410
11	Stem Nut	ASTM A439 Type D2/D2C
12	Yoke Cap	ASTM A536 Gr. 65-45-12
13	Hand wheel	ASTM A47 Gr. 32510
14	Hand wheel Nut	ASTM A47 Gr. 32510
15	Spring Pin	Steel- DIN 914
16	Gland Eyebolt	ASTM A307 Gr.B
17	Gland Eyebolt Nut	ASTM A194 Gr. 2H
18	Groove Pin	ASTM A108 Gr.1040
19	Body-Bonnet Stud	ASTM A193 Gr. B7
20	Stud Nut	ASTM A194 Gr. 2H
21	Lubricator	Steel- DIN 71412

- On the customer requests for class 600, octagonal ring joint will be used instead gasket
- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

Main Dimensions and Weighs

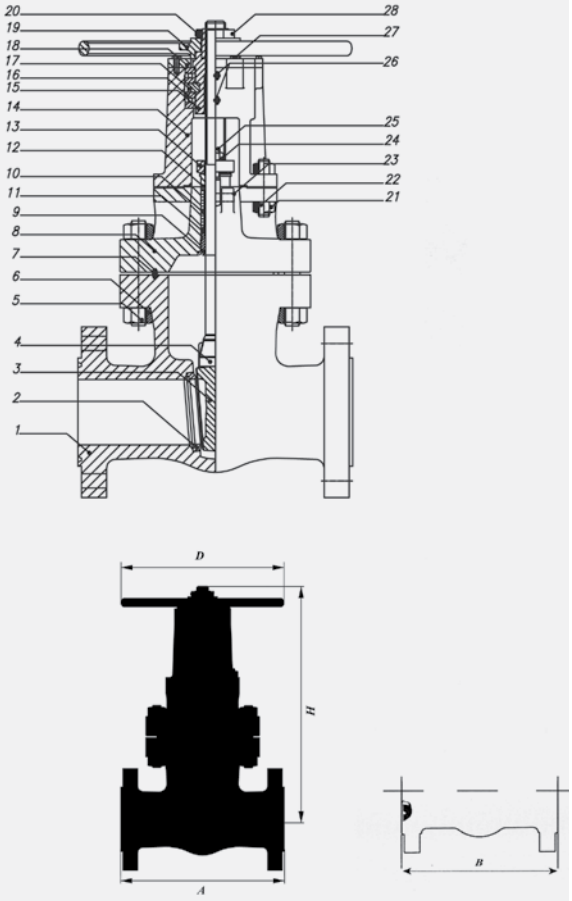
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	26	28	30	32	36	40	42	48
A (RF)	mm	292	330	356	432	508	559	660	787	838	889	991	1092	1194	1397	1448	1549	1651	1778	2083	2149	2261	2667
A (BW)		292	330	356	432	508	559	660	787	838	889	991	1092	1194	1397	1448	1549	1651	1778	2083	2149	2261	2667
B (RTJ)		295	333	359	435	511	562	663	791	841	892	994	1095	1200	1407	1461	1562	1664	1794	2099	-	-	-
H (Open)		431	485	546	651	745	970	1122	1330	1519	1561	1759	1908	2101	2563	2727	2902	3016	3156	3450	3600	3950	4600
D		200	250	280	300	400	500	560	720	800	-	-	-	-	-	-	-	-	-	-	-	-	-
WT (RF)	kg	31	45	58	106	150	305	537	734	962	1108	1500	1896	2528	4080	4668	5960	7000	8312	10125	14300	16460	22900
WT (BW)		26	37	50	84	123	272	494	610	820	939	1210	1588	2201	3672	4248	4918	6000	7000	9580	11400	13700	19000

Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test	Pneumatic Test
2225 psi (153.4 bar - gage)	1630 psi (112.4 bar - gage)	80 psi (5.5 bar - gage)

Class900
Cast steel gate valve

Bolted Bonnet
Rising Stem
Outside Screw and Yoke
Solid Wedge Disk



Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr. WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020/E410
3	Wedge	ASTM A216 Gr. WCB/E410 or ASTM A217 Gr.CA15
4	Stem	ASTM A276 Type 420 or 410
5	Body And Bonnet Stud Bolt	ASTM A193 Gr. B7
6	Body And Bonnet Stud Nut	ASTM A194 Gr. 2H
7	Octagonal Ring Gasket	AISI 304 or 316
8	Bonnet	ASTM A216 Gr. WCB
9	Backseat Bushing	ASTM A276 Type 420 or 410
10	Packing	GRAFOIL
11	Sracer Ring	ASTM A276 Type 304
12	Gland	ASTM A276 Type 420 or 410
13	Gland Flang	ASTM A105 /ASTM A216 Gr. WCB
14	Yoke	ASTM A216 Gr. WCB
15	Stem Nut	ASTM A439 Type D2
16	Ball Bearing	DIN 711
17	Support Ring	ASTM A515 Gr. 70
18	Yoke Cap	ASTM A216 Gr. WCB
19	Handwheel	ASTM A47 Gr. 32510
20	Spring Pin	STEEL - DIN 914
21	Bonnet And Yoke Stud Nut	ASTM A194 Gr. 2H
22	Bonnet And Yoke Stud Bolt	ASTM A193 Gr. B7
23	Groove Pin	ASTM A276 Type 420
24	Gland Eyebolt Nut	ASTM A194 Gr. 2H
25	Gland Eyebolt	ASTM A307 Gr. B
26	Lubricator	STEEL - DIN 71412
27	Bolt	ASTM A193 Gr. B7
28	Handwheel Nut	ASTM A47 Gr.32510

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5
- Maybe there are the other parts in some sizes.

Main Dimensions and Weighs

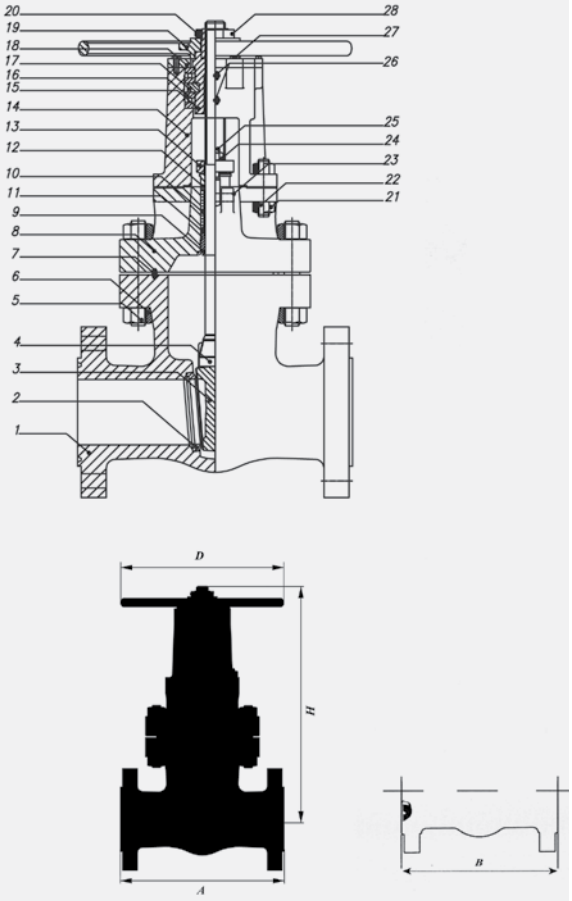
NPS	in	2	3	4	5	6	8	10	12	14	16	18	20	24
A (RF)	mm	368	381	457	559	610	737	838	965	1029	1130	1219	1321	1549
A (BW)		368	381	457	559	610	737	838	965	1029	1130	1219	1321	1549
B (RTJ)		371	384	460	562	613	740	841	968	1038	1140	1232	1334	1568
H (Open)		479	577	653	762	863	1113	1224	1384	1574	1684	2362	2463	3048
D		280	300	350	400	500	-	-	-	-	-	-	-	-
WT (RF)	kg	62	88	140	240	300	550	848	1340	1900	2280	3000	3800	4900
WT (BW)		55	66	102	200	245	456	736	1215	1750	2077	2734	3474	4240

Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test	Pneumatic Test
3350 psi (230.8 bar - gage)	2475 psi (170.5)	80 psi (5.5 bar - gage)

Class1500
Cast steel gate valve

Bolted Bonnet
Rising Stem
Outside Screw and Yoke
Solid Wedge Disk



Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr. WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020/E410
3	Wedge	ASTM A216 Gr. WCB/E410 or ASTM A217 Gr.CA15
4	Stem	ASTM A276 Type 420 or 410
5	Body And Bonnet Stud Bolt	ASTM A193 Gr. B7
6	Body And Bonnet Stud Nut	ASTM A194 Gr. 2H
7	Octagonal Ring Gasket	AISI 304 or 316
8	Bonnet	ASTM A216 Gr. WCB
9	Backseat Bushing	ASTM A276 Type 420 or 410
10	Packing	GRAFOIL
11	Sracer Ring	ASTM A276 Type 304
12	Gland	ASTM A276 Type 420 or 410
13	Gland Flange	ASTM A105 /ASTM A216 Gr. WCB
14	Yoke	ASTM A216 Gr. WCB
15	Stem Nut	ASTM A439 Type D2
16	Ball Bearing	DIN 711
17	Support Ring	ASTM A515 Gr. 70
18	Yoke Cap	ASTM A216 Gr. WCB
19	Handwheel	ASTM A47 Gr. 32510
20	Spring Pin	STEEL - DIN 914
21	Bonnet And Yoke Stud Nut	ASTM A194 Gr. 2H
22	Bonnet And Yoke Stud Bolt	ASTM A193 Gr. B7
23	Groove Pin	ASTM A276 Type 420
24	Gland Eyebolt Nut	ASTM A194 Gr. 2H
25	Gland Eyebolt	ASTM A307 Gr. B
26	Lubricator	STEEL - DIN 71412
27	Bolt	ASTM A193 Gr. B7
28	Handwheel Nut	ASTM A47 Gr.32510

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5
- Maybe there are the other parts in some sizes.

Main Dimensions and Weighs

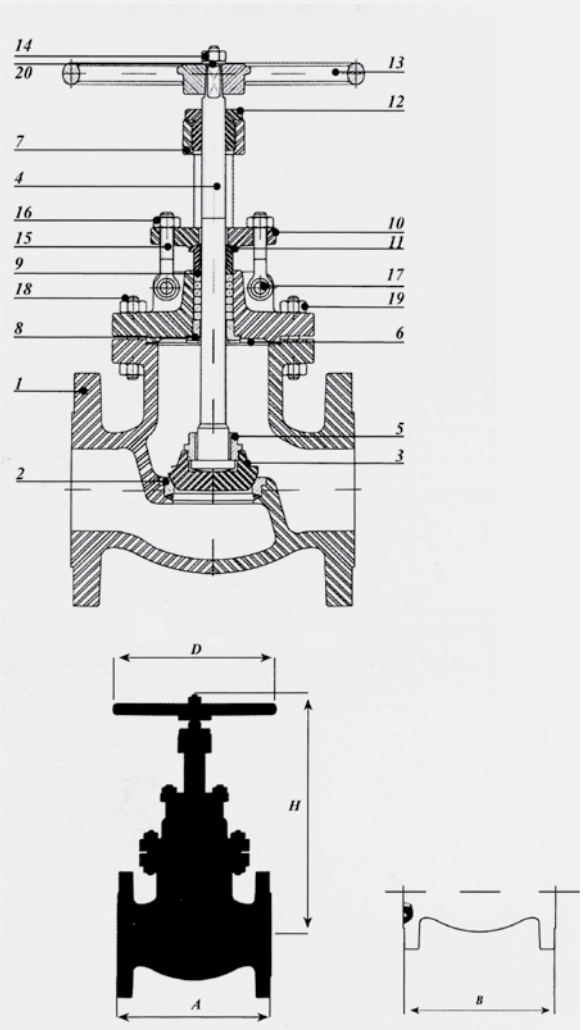
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24
A (RF)	mm	368	419	470	546	673	705	832	991	1130	1257	1384	1537	1664	1943
A (BW)		368	419	470	546	673	705	832	991	1130	1257	1384	1537	1664	1943
B (RTJ)		371	422	473	549	676	711	841	1000	1146	1276	1407	1559	1686	1972
H (Open)		485	608	700	742	1009	1042	1370	1520	1651	1945	2250	2438	2590	2946
D		280	350	400	400	600	-	-	-	-	-	-	-	-	-
WT (RF)	kg	68	126	175	288	430	532	1228	2278	3260	4100	5500	7300	8800	11000
WT (BW)		61	98	144	232	360	440	978	1990	2850	3320	4782	6347	7652	9565

Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test	Pneumatic Test
5925 psi (387.5 bar - gage)	4125 psi (284 bar - gage)	80 psi (5.5 bar - gage)

Globe valve

Class150
Cast steel globe valve



Bolted Bonnet
Rising Stem
Outside Screw and Yoke

Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr.WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020 / E410
3	Disc	ASTM A182 Gr. F6a or ASTM A276 Type 410 or 420
4	Stem	ASTM A276 Type 410 or 420
5	Disc Nut	ASTM A276 Type 316
6	Gasket	Soft Iron
7	Bonnet	ASTM A216 Gr.WCB
8	Back Seat Bushing	ASTM A276 Type 410 or 420
9	Packing	Grafoil
10	Gland Flange	ASTM A105/ASTM A216 Gr. WCB
11	Gland	ASTM A276 Type 410
12	Stem Nut	ASTM A439 Type D2/D2C
13	Hand wheel	ASTM A47 Gr. 32510
14	Hand wheel Nut	ASTM A194 Gr. 2H
15	Gland Eyebolt	ASTM A307 Gr. B
16	Gland Eyebolt Nut	ASTM A194 Gr. 2H
17	Groove Pin	ASTM A108 Gr. 1040
18	Body-Bonnet Stud	ASTM A193 Gr. B7
19	Stud Nut	ASTM A194 Gr. 2H
20	Washer	Carbon Steel

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

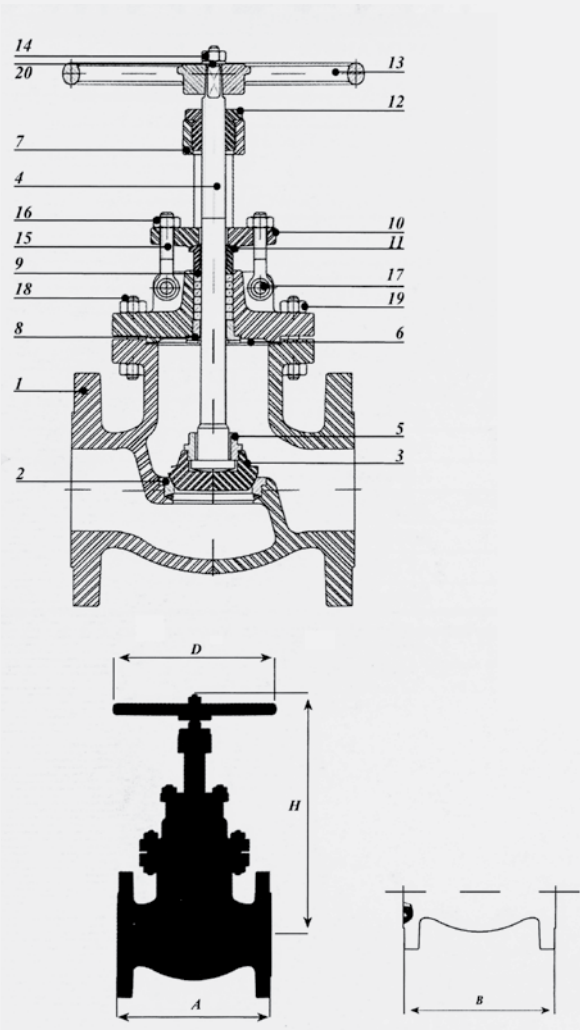
Main Dimensions and Weighs

NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24
A (RF)	mm	203	216	241	292	356	406	495	622	698	787	914	978	978	1295
A (BW)		203	216	241	292	356	406	495	622	698	787	914	978	978	1295
B (RTJ)		216	229	254	305	368	419	508	635	711	800	927	991	991	1308
H (Open)		326	344	403	460	528	557	626	817	895	967	1022	1065	1100	1190
D		200	250	280	280	300	350	400	450	550	-	-	-	-	-
WT (RF)	kg	16	22	28	49	77	86	156	236	440	551	616	1150	1350	2300
WT (BW)		13	19	25	41	65	78	144	201	405	502	558	1035	1200	2054

Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test	Pneumatic Test
450 psi (31 bar - gage)	315 psi (21.7 bar - gage)	80 psi (5.5 bar - gage)

Class300
Cast steel globe valve



Bolted Bonnet
Rising Stem
Outside Screw and Yoke

Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr.WCB
2	Seat Ring	ASTM A108 Or. 1018-1020 / E410
3	Disc	ASTM A182 Gr. F6a or ASTM A276 Type 410 or 420
4	Stem	ASTM A276 Type 410 or 420
5	Disc Nut	ASTM A276 Type 316
6	Gasket	Spiral Wound
7	Bonnet	ASTM A216 Gr.WCB
8	Back Seat Bushing	ASTM A276 Type 410 or 420
9	Packing	Grafoil
10	Gland Flange	ASTM A105/ASTM A216 Gr. WCB
11	Gland	ASTM A276 Type 410
12	Stem Nut	ASTM A439 Type D2/D2C
13	Hand wheel	ASTM A47 Gr. 32510
14	Hand wheel Nut	ASTM A194 Gr. 2H
15	Gland Eyebolt	ASTM A307 Gr. B
16	Gland Eyebolt Nut	ASTM A194 Gr. 2H
17	Groove Pin	ASTM A108 Gr. 1040
18	Body-Bonnet Stud	ASTM A193 Gr. B7
19	Stud Nut	ASTM A194 Gr. 2H
20	Washer	Carbon Steel

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

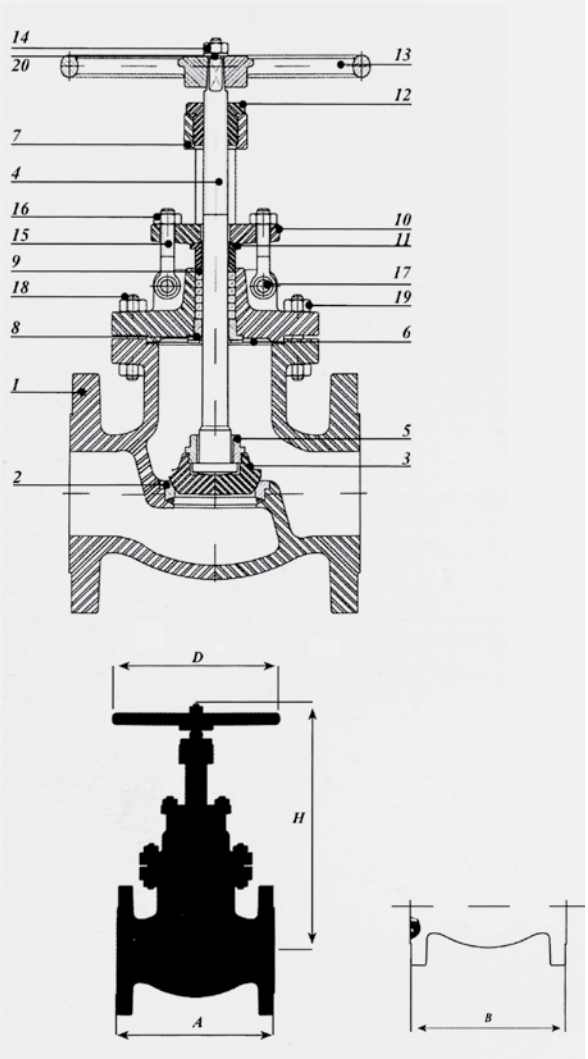
Main Dimensions and Weighs

NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20
A (RF)	mm	267	292	318	356	400	444	559	622	711	838	864	978	1016
A (BW)		267	292	318	356	400	444	559	622	711	838	864	978	1016
B (RTJ)		283	308	333	371	416	460	575	638	727	854	879	994	1035
H (Open)		360	393	420	484	581	619	807	929	1056	1181	1325	1412	1501
D		200	200	250	300	350	400	500	550	600	-	-	-	-
WT (RF)	kg	22	32	48	70	130	182	252	376	520	876	1360	1910	2645
WT (BW)		18	27	42	60	110	163	214	322	422	782	1203	1705	2362

Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test	Pneumatic Test
1125 psi (77.5 bar - gage)	815 psi (56.2 bar - gage)	80 psi (5.5 bar - gage)

Class600
Cast steel globe valve



Bolted Bonnet
Rising Stem
Outside Screw and Yoke

Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr.WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020 / E410
3	Disc	ASTM A 182 Gr. F6a or ASTM A276 Type 410 or 420
4	Stem	ASTM A276 Type 410 or 420
5	Disc Nut	ASTM A276 Type 316
6	Gasket	Soft Iron / Spiral Wound
7	Bonnet	ASTM A216 Gr.WCB
8	Back Seat Bushing	ASTM A276 Type 410 or 420
9	Packing	Grafoil
10	Gland Flange	ASTM A105/ASTM A216 Gr. WCB
11	Gland	ASTM A276 Type 410
12	Stem Nut	ASTM A439 Type D2/D2C
13	Hand wheel	ASTM A47 Gr. 32510
14	Hand wheel Nut	ASTM A194 Gr. 2H
15	Gland Eyebolt	ASTM A307 Gr. B
16	Gland Eyebolt Nut	ASTM A194 Gr. 2H
17	Groove Pin	ASTM A108 Gr. 1040
18	Body-Bonnet Stud	ASTM A193 Gr. B7
19	Stud Nut	ASTM A194 Gr. 2H
20	Washer	Carbon Steel

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

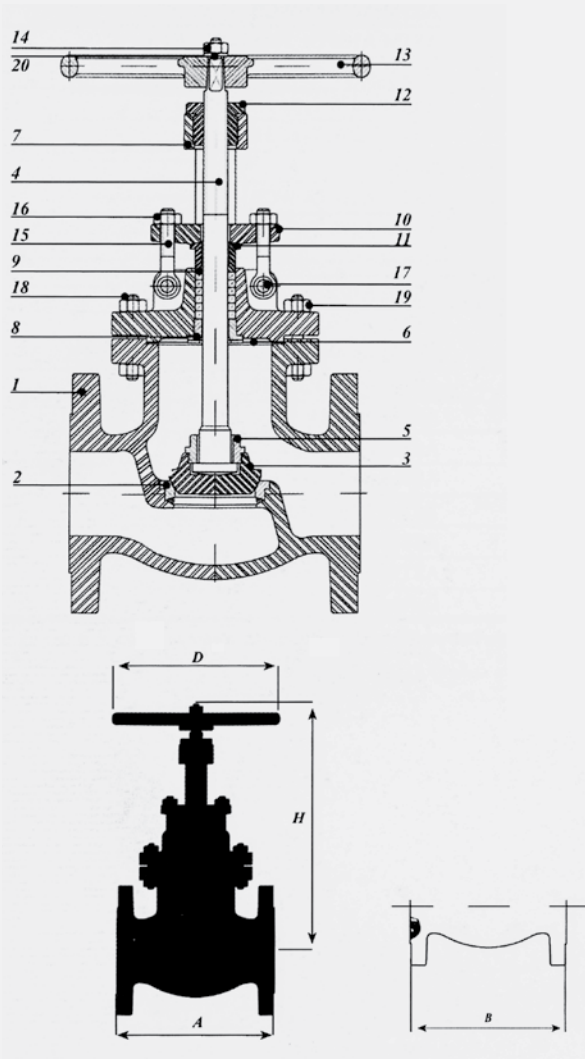
Main Dimensions and Weighs

NPS	in	2	2½	3	4	5	6	8	10	12	14	16
A (RF)	mm	292	330	356	432	508	559	660	787	838	889	991
A (BW)		292	330	356	432	508	559	660	787	838	889	991
B (RTJ)		295	333	359	435	511	562	664	791	841	892	994
H (Open)		356	406	452	548	711	788	862	936	993	1069	1313
D		280	300	350	400	450	500	550	-	-	-	-
WT (RF)	kg	42	48	56	100	170	262	420	745	1031	1341	1901
WT (BW)		37	40	42	78	145	225	362	621	889	1197	1697

Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test	Pneumatic Test
2250 psi (153 bar - gage)	1650 psi (112.2 bar - gage)	80 psi (5.5 bar - gage)

Class900
Cast steel globe valve



Bolted Bonnet
Rising Stem
Outside Screw and Yoke

Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr.WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020 / E410
3	Disc	ASTM A 182 Gr. F6a or ASTM A276 Type 410 or 420
4	Stem	ASTM A276 Type 410 or 420
5	Disc Nut	ASTM A276 Type 316
6	Gasket	Soft Iron / Spiral Wound
7	Bonnet	ASTM A216 Gr.WCB
8	Back Seat Bushing	ASTM A276 Type 410 or 420
9	Packing	Grafoil
10	Gland Flange	ASTM A105/ASTM A216 Gr. WCB
11	Gland	ASTM A276 Type 410
12	Stem Nut	ASTM A439 Type D2/D2C
13	Hand wheel	ASTM A47 Gr. 32510
14	Hand wheel Nut	ASTM A194 Gr. 2H
15	Gland Eyebolt	ASTM A307 Gr. B
16	Gland Eyebolt Nut	ASTM A194 Gr. 2H
17	Groove Pin	ASTM A108 Gr. 1040
18	Body-Bonnet Stud	ASTM A193 Gr. B7
19	Stud Nut	ASTM A194 Gr. 2H
20	Washer	Carbon Steel

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

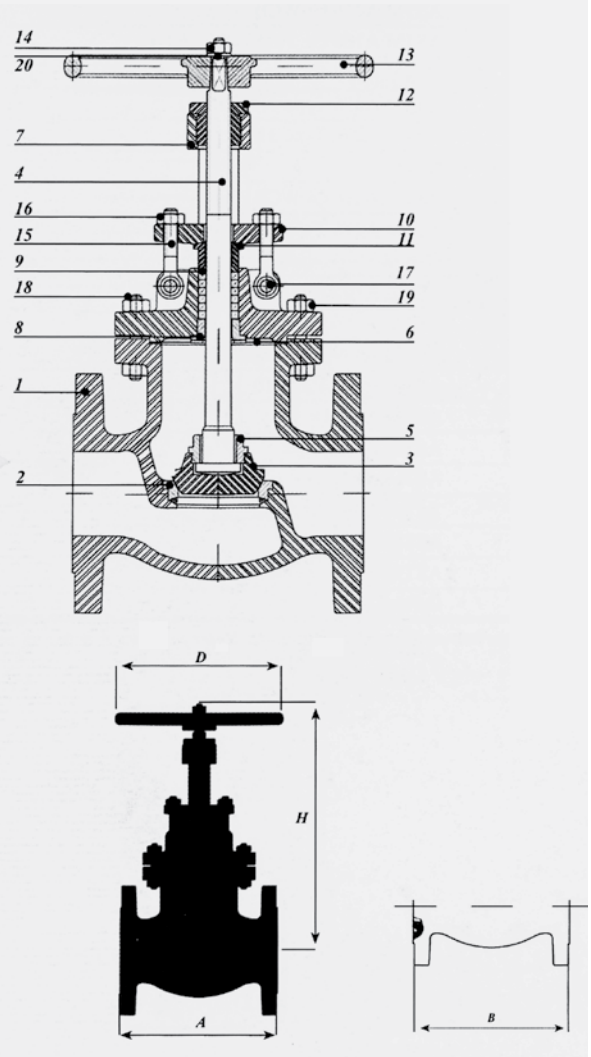
Main Dimensions and Weighs

NPS	in	2	3	4	5	6	8	10	12	14	16
A (RF)	mm	368	381	457	559	610	737	838	965	1029	1130
A (BW)		368	381	457	559	610	737	838	965	1029	1130
B (RTJ)		371	384	460	562	613	740	841	968	1038	1140
H (Open)		395	502	612	749	841	954	1026	1152	1220	1280
D		350	400	400	400	600	-	-	-	-	-
WT (RF)	kg	68	118	205	285	399	706	1030	1650	2090	2750
WT (BW)		61	94	124	240	344	630	918	1473	1866	2455

Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test	Pneumatic Test
3375 psi (229.6 bar - gage)	2475 psi (168.3 bar - gage)	80 psi (5.5 bar - gage)

Class1500
Cast steel globe valve



Bolted Bonnet
Rising Stem
Outside Screw and Yoke

Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr.WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020 / E410
3	Disc	ASTM A 182 Gr. F6a or ASTM A276 Type 410 or 420
4	Stem	ASTM A276 Type 410 or 420
5	Disc Nut	ASTM A276 Type 316
6	Gasket	Soft Iron / Spiral Wound
7	Bonnet	ASTM A216 Gr.WCB
8	Back Seat Bushing	ASTM A276 Type 410 or 420
9	Packing	Grafoil
10	Gland Flange	ASTM A105/ASTM A216 Gr. WCB
11	Gland	ASTM A276 Type 410
12	Stem Nut	ASTM A439 Type D2/D2C
13	Hand wheel	ASTM A47 Gr. 32510
14	Hand wheel Nut	ASTM A194 Gr. 2H
15	Gland Eyebolt	ASTM A307 Gr. B
16	Gland Eyebolt Nut	ASTM A194 Gr. 2H
17	Groove Pin	ASTM A108 Gr. 1040
18	Body-Bonnet Stud	ASTM A193 Gr. B7
19	Stud Nut	ASTM A194 Gr. 2H
20	Washer	Carbon Steel

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

Main Dimensions and Weighs

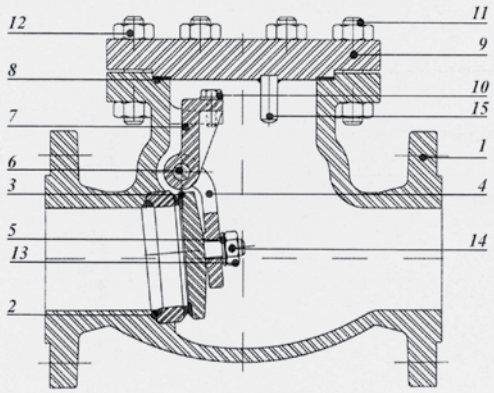
NPS	in	2	2½	3	4	5	6	8	10	12	14	16
A (RF)	mm	368	419	470	546	673	705	832	991	1130	1257	1384
A (BW)		368	419	470	546	673	705	832	991	1130	1257	1384
B (RTJ)		371	422	473	549	676	711	841	1000	1146	1276	1407
H (Open)		434	565	685	798	905	981	1145	1300	1450	1600	1780
D		350	400	450	-	-	-	-	-	-	-	-
WT (RF)	kg	70	126	180	300	473	585	1351	2506	3586	4510	5949
WT (BW)		63	108	155	268	422	522	1206	2238	3202	4027	5303

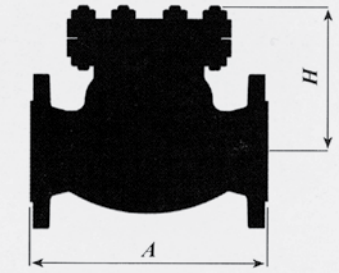
Test Pressure To API 598

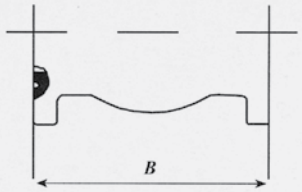
Hydrostatic Shell Test	Hydrostatic Seat Test	Pneumatic Test
5625 psi (382.6 bar - gage)	4125 psi (280 bar - gage)	80 psi (5.5 bar - gage)

Check valve

Class150
Cast steel check valve







Swing Check
Bolted Cap

Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr.WCB
2	Seat Ring	ASTM A108 Gr.1018 -1020 / E410
3	Disc	ASTM A182 Gr. F6a or ASTM A276 Type 410 or 420
4	Strap	ASTM A216 Gr.WCB
5	Disc Washer	ASTM A276 Type 420
6	Hinge Pin	ASTM A276 Type 420
7	Holder	ASTM A216 Gr.WCB
8	Gasket	Soft iron
9	Cap	ASTM A216 Gr.WCB or ASTM A515 Gr. 70
10	Screw	ASTM A193 Gr. B8
11	Cap Stud Bolt	ASTM A193 Gr. B7
12	Cap Stud Nut	ASTM A194 Gr. 2H
13	Disk Nut	ASTM A194 Gr. 2H
14	Cutter Pin	Stainless Steel
15	Arbor	ASTM 108 Gr.1020

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

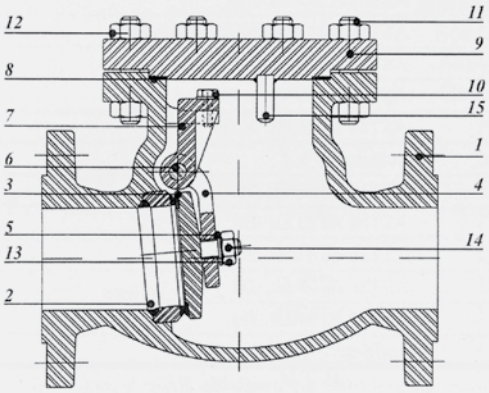
Main Dimensions and Weighs

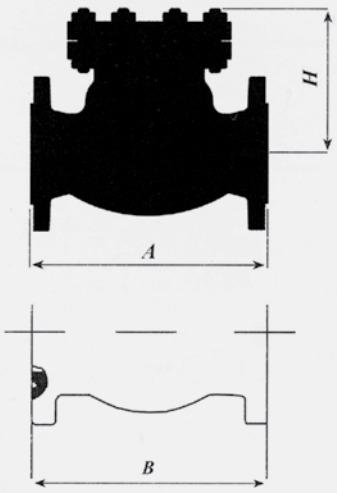
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	26	28	30	32	36	40	42	48
A (RF)	mm	203	216	241	292	330	356	495	622	698	787	864	978	978	1295	1295	1448	1524	1727	1956	2185	2385	2635
A (BW)		203	216	241	292	330	356	495	622	698	787	864	978	978	1295	1295	1448	1524	1727	1956	2185	2385	2635
B (RTJ)		216	229	254	305	343	368	508	635	711	800	877	991	991	1308	-	-	-	-	-	-	-	-
H		122	139	156	230	241	284	340	360	415	505	522	600	660	763	822	838	920	1016	1111	1189	1226	1359
WT (RF)	kg	12	16	22	38	62	105	160	270	375	475	675	725	800	910	1462	2500	2665	2800	3344	4100	4700	6200
WT (BW)		9	13	19	30	54	97	148	233	351	426	613	673	716	803	1362	2190	2278	2345	2940	3700	4200	5650

Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test
450 psi (31 bar - gage)	315 psi (21.7 bar - gage)

Class300
Cast steel check valve





Swing Check
Bolted Cap

Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr. WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020/ E410
3	Disc	ASTM A182 Gr. F6a or ASTM A276 Type 410 or 420
4	Strap	ASTM A216 Gr.WCB
5	Disc Washer	ASTM A276 Type 420
6	Hinge Pin	ASTM A276 Type 420
7	Holder	ASTM A216 Gr.WCB
8	Gasket	Spiral Wound
9	Cap	ASTM A515 Gr. 70
10	Screw	ASTM A 193 Gr. B8
11	Cap Stud Bolt	ASTM A193 Gr. 87
12	Cap Stud Nut	ASTM A194 Gr. 2H
13	Disk Nut	ASTM A194 Gr. 2H
14	Cutter Pin	Stainless Steel
15	Arbor	ASTM 108 Gr.1020

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

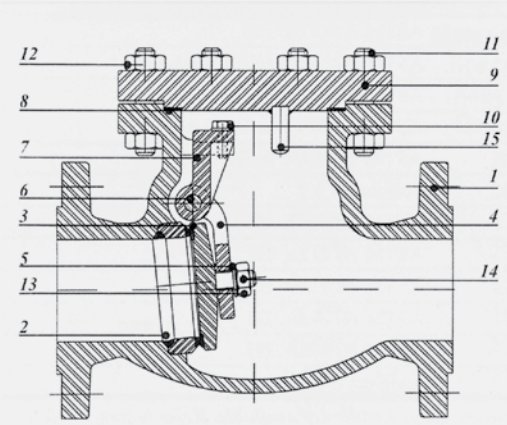
Main Dimensions and Weighs

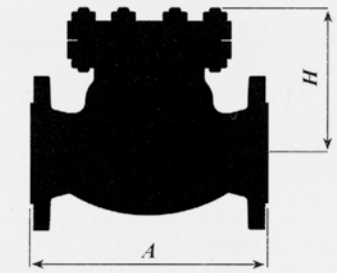
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	26	28	30	32	36	40	42	48
A (RF)	mm	267	292	318	356	400	444	533	622	711	838	864	978	1016	1346	1346	1499	1594	1727	2083	2309	2470	2805
A (BW)		267	292	318	356	400	444	533	622	711	838	864	978	1016	1346	1346	1499	1594	1727	2083	2309	2470	2805
B (RTJ)		283	308	333	371	416	460	549	638	727	854	880	994	1035	1368	1372	1524	1619	1750	2111	-	-	-
H		129	152	167	250	277	294	364	410	460	543	606	623	685	802	830	866	950	1016	1143	1230	1350	1420
WT (RF)	kg	16	27	34	54	99	162	266	403	560	630	704	1025	1166	1946	2210	2650	3200	4700	5400	5900	7200	9800
WT (BW)		12	22	28	44	76	144	228	368	525	582	634	851	1010	1636	1950	2350	2850	3900	4700	5200	6300	8700

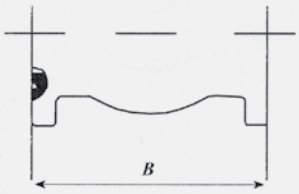
Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test
1125 psi (77.5 bar - gage)	815 psi (56.2 bar - gage)

Class600
Cast steel check valve







Swing Check
Bolted Cap

Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr. WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020 / E410
3	Disc	ASTM A182 Gr. F6a or ASTM A276 Type 410 or 420
4	Strap	ASTM A216 Gr.WCB
5	Disc Washer	ASTM A276 Type 420
6	Hinge Pin	ASTM A276 Type 420
7	Holder	ASTM A216 Gr.WCB
8	Gasket	Soft iron / Spiral Wound
9	Cap	ASTM A515 Gr. 70
10	Screw	ASTM A193 Gr. B8
11	Cap Stud Bolt	ASTM A193 Gr. B7
12	Cap Stud Nut	ASTM A194 Gr. 2H
13	Disk Nut	ASTM A194 Gr. 2H
14	Cutter Pin	Stainless Steel

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

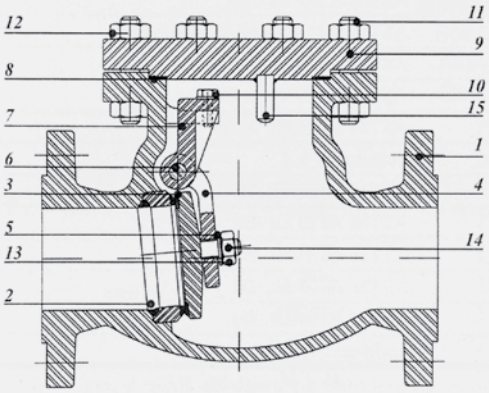
Main Dimensions and Weighs

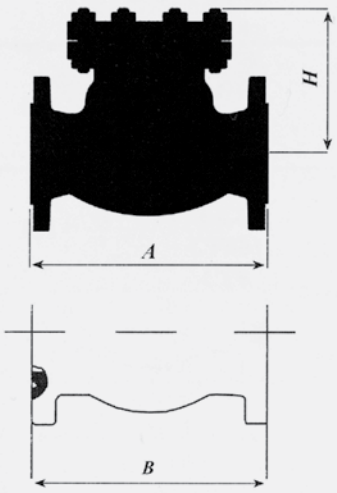
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	26	28	30	32	36	40	42	48
A (RF)	mm	292	330	356	432	508	559	660	787	838	889	991	1092	1194	1397	1448	1600	1651	1820	2083	2360	2505	2930
A (BW)		292	330	356	432	508	559	660	787	838	889	991	1092	1194	1397	1448	1600	1651	1820	2083	2360	2505	2930
B (RTJ)		295	333	359	435	511	562	664	791	841	892	994	1095	1200	1407	1461	1613	1664	1836	2099	-	-	-
H		141	205	224	260	334	345	420	485	550	584	697	701	746	947	1006	1066	1120	1200	1260	1390	1480	1600
WT (RF)	kg	22	42	46	111	180	212	405	673	775	900	1212	1464	1871	2978	3700	4001	4500	5300	7050	8400	9500	14000
WT (BW)		18	30	32	89	130	162	347	549	633	731	922	1156	1544	2570	3280	3125	3600	4251	5560	7000	8100	11300

Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test
2225 psi (153.4 bar - gage)	1630 psi (112.4 bar - gage)

Class900
Cast steel check valve





Swing Check
Bolted Cap

Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr. WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020/ E410
3	Disc	ASTM A182 Gr. F6a or ASTM A276 Type 410 or 420
4	Strap	ASTM A216 Gr.WCB
5	Disc Washer	ASTM A276 Type 420
6	Hinge Pin	ASTM A276 Type 420
7	Holder	ASTM A216 Gr.WCB
8	Gasket	Spiral Wound
9	Cap	ASTM A515 Gr. 70
10	Screw	ASTM A 193 Gr. B8
11	Cap Stud Bolt	ASTM A193 Gr. 87
12	Cap Stud Nut	ASTM A194 Gr. 2H
13	Disk Nut	ASTM A194 Gr. 2H
14	Cutter Pin	Stainless Steel
15	Arbor	ASTM 108 Gr.1020

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

Main Dimensions and Weighs

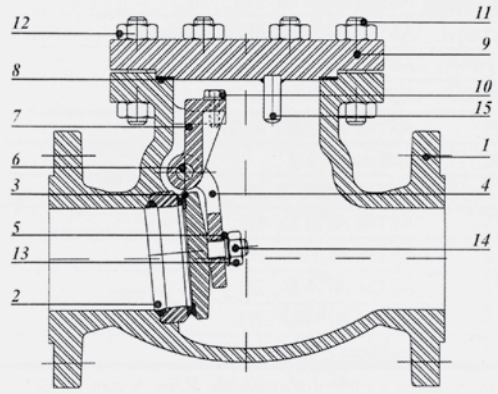
NPS	in	2	3	4	5	6	8	10	12	14	16	18	20	24
A (RF)	mm	368	381	457	559	610	737	838	965	1029	1130	1219	1321	1549
A (BW)		368	381	457	559	610	737	838	965	1029	1130	1219	1321	1549
B (RTJ)		371	384	460	562	613	740	841	968	1038	1140	1232	1334	1568
H		249	255	320	360	366	434	499	585	630	700	864	940	1067
WT (RF)	kg	54	76	121	185	246	452	750	1035	1200	2130	2840	3756	6000
WT (BW)		47	67	83	138	191	358	638	975	1240	1760	2000	2700	4100

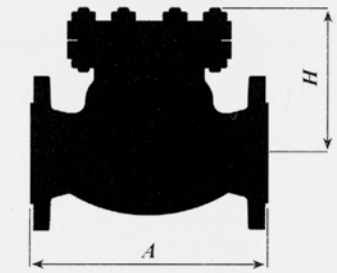
Test Pressure To API 598

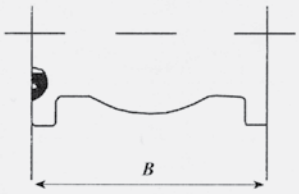
Hydrostatic Shell Test	Hydrostatic Seat Test
3330 psi (229.6 bar - gage)	2442 psi (168.4 bar - gage)

Class1500
Cast steel check valve

Swing Check
Bolted Cap







Parts and Materials

No	Part Name	Material
1	Body	ASTM A216 Gr. WCB
2	Seat Ring	ASTM A108 Gr. 1018-1020 / E410
3	Disc	ASTM A182 Gr. F6a or ASTM A276 Type 410 or 420
4	Strap	ASTM A216 Gr.WCB
5	Disc Washer	ASTM A276 Type 420
6	Hinge Pin	ASTM A276 Type 420
7	Holder	ASTM A216 Gr.WCB
8	Gasket	Soft iron / Spiral Wound
9	Cap	ASTM A515 Gr. 70
10	Screw	ASTM A193 Gr. B8
11	Cap Stud Bolt	ASTM A193 Gr. B7
12	Cap Stud Nut	ASTM A194 Gr. 2H
13	Disk Nut	ASTM A194 Gr. 2H
14	Cutter Pin	Stainless Steel

- Other Body - Bonnet casting materials and trims are available. Refer to pages 4 & 5

Main Dimensions and Weighs

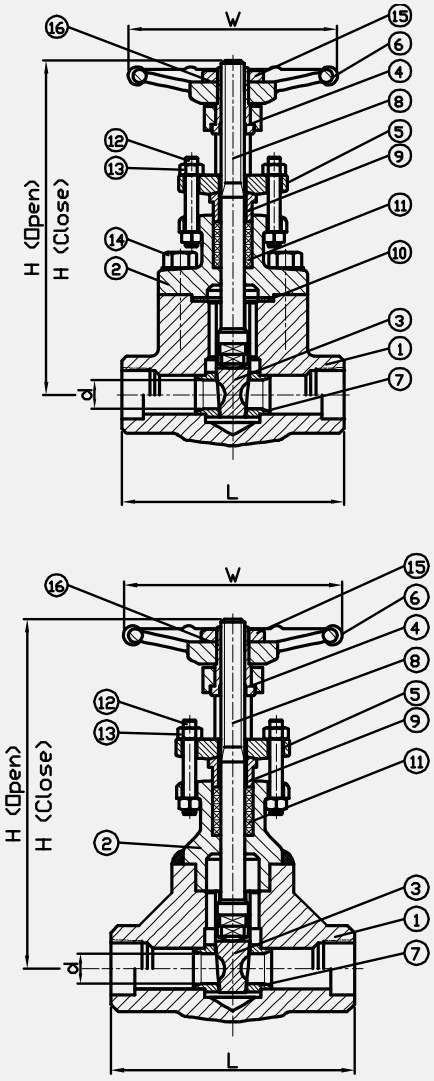
NPS	in	2	2½	3	4	5	6	8	10	12	14	16	18	20	24
A (RF)	mm	368	419	470	546	673	705	832	991	1130	1257	1384	1537	1664	1943
A (BW)		368	419	470	546	673	705	832	991	1130	1257	1384	1537	1664	1943
B (RTJ)		371	422	473	549	676	711	842	1000	1146	1276	1407	1559	1686	1972
H		249	311	320	357	381	481	548	560	650	750	787	885	960	1120
WT (RF)	kg	54	93	110	182	325	414	795	1490	1970	2900	3600	4500	5400	8200
WT (BW)		47	74	82	126	241	322	650	1250	1625	2521	3130	3913	4695	7130

Test Pressure To API 598

Hydrostatic Shell Test	Hydrostatic Seat Test
5558 psi (378 bar - gage)	4125 psi (280.6 bar - gage)

Forged steel valves

Class800
Forged steel gate valve



Standards

End Threads: ANSI B 1.20.1
Socked-Weld: ANSI B 16.11
Basic Design: API 602
Test: API 598

Bolted And Welded Bonnet
Sw/Npt/Bw

ASTM A105
Bolted Or Welded Bonnet
OS&Y
Threaded Ends
Rising Stem

Parts and Materials

No	Part Name	Material
1	Body	ASTM A105
2	Bonnet	ASTM A105
3	Wedge	ASTM A182-F6a
4	Stem Nut	ASTM A439-D2
5	Gland Flange	ASTM A105
6	Hand Wheel	Ductile Iron
7	Seat Ring	ASTM A276-410
8	Stem	ASTM A182-F6a
9	Gland	ASTM A276-420
10	Gasket	304SS / Graphite Spiral Wound
11	Packing	Graphite
12	Stud	ASTM A193-B7
13	Nut	ASTM A194-2H
14	Body & Bonnet Stud	ASTM A193-B7
15	Hand Wheel Nut	Carbon Steel
16	Name Plate	Aluminum

- Body material LF2, F5, 304, 304L, 316 and 316L also available.
- Socket-Weld ends on request

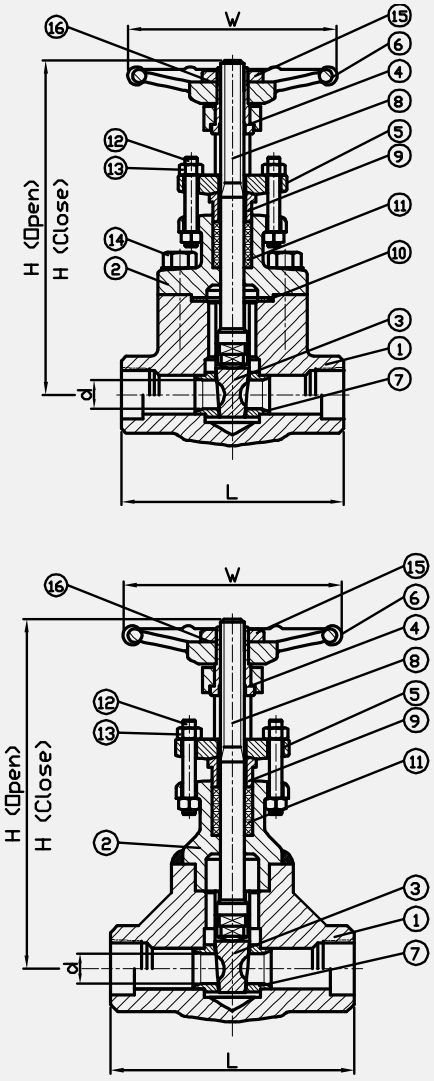
Dimention & Weights Regular Bore

Class	Size	L (mm)	d (mm)	W (mm)	H Open (mm)	H Close (mm)	Weight (Kg)
800	1/4″	80	8.5	90	143	132	1.8
	3/8″	80	10	90	145	132	1.8
	1/2″	90	14	90	156	140	2.2
	3/4″	110	18	100	186	166	3.4
	1″	127	24	120	216	190	5.3
	1 1/4″	127	31	140	255	222	7.1
	1 1/2″	130	36.5	140	273	230	9.2
	2″	150	48	200	334	284	14.2

Dimention & Weights Full Bore

Class	Size	L (mm)	d (mm)	W (mm)	H Open (mm)	H Close (mm)	Weight (Kg)
800	1/4″	-	-	-	-	-	-
	3/8″	-	-	-	-	-	-
	1/2″	80	10	90	145	132	1.7
	3/4″	90	14	90	156	140	2.1
	1″	110	18	100	186	173	3.3
	1 1/4″	127	24	120	216	209	5.2
	1 1/2″	127	31	140	255	228	7.0
	2″	130	36.5	140	273	247	9.1

Class1500
Forged steel gate valve



Standards

End Threads: ANSI B 1.20.1
Socked-Weld: ANSI B 16.11
Basic Design: API 602
Test: API 598

Bolted And Welded Bonnet
Sw/Npt/Bw

ASTM A105
Bolted Or Welded Bonnet
OS&Y
Threaded Ends
Rising Stem

Parts and Materials

No	Part Name	Material
1	Body	ASTM A105
2	Bonnet	ASTM A105
3	Wedge	ASTM A182-F6a
4	Stem Nut	ASTM A439-D2
5	Gland Flange	ASTM A105
6	Hand Wheel	Ductile Iron
7	Seat Ring	ASTM A276-410
8	Stem	ASTM A182-F6a
9	Gland	ASTM A276-420
10	Gasket	304SS/Graphite Spiral Wound
11	Packing	Graphite
12	Stud	ASTM A193-B7
13	Nut	ASTM A194-2H
14	Body & Bonnet Stud	ASTM A193-B7
15	Hand Wheel Nut	Carbon Steel
16	Name Plate	Aluminum

- Body material LF2, F5, 304, 304L, 316 and 316L also available.
- Socket-Weld ends on request

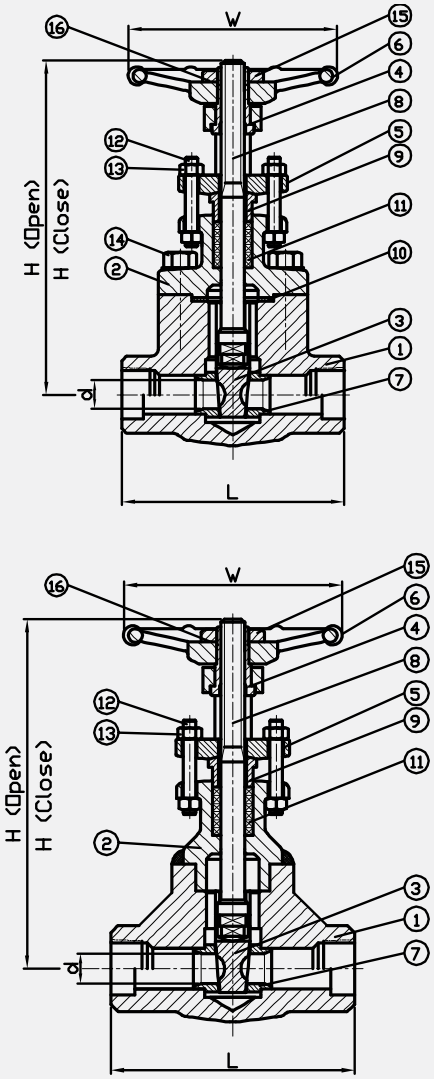
Dimention & Weights Standard Bore - Welded Bonnet

Class	Size	L (mm)	d (mm)	W (mm)	H Open (mm)	H Close (mm)	Weight (Kg)
1500	1/4″	-	-	-	-	-	-
	3/8″	-	-	-	-	-	-
	1/2″	90	11.5	120	175	163	2.0
	3/4″	110	15	175	217	201	3.2
	1″	127	19.5	175	234	214	4.9
	1 1/4″	-	-	-	-	-	-
	1 1/2″	130	32	200	295	261	8.5
	2″	150	40	260	375	253	15

Dimention & Weights Standard Bore - Bolted Bonnet

Class	Size	L (mm)	d (mm)	W (mm)	H Open (mm)	H Close (mm)	Weight (Kg)
1500	1/4″	-	-	-	-	-	-
	3/8″	-	-	-	-	-	-
	1/2″	110	11.5	120	212	201	5.9
	3/4″	115	15	175	256	241	8.4
	1″	130	19.5	175	272	251	9.8
	1 1/4″	-	-	-	-	-	-
	1 1/2″	210	32	260	411	376	26.8
	2″	240	40	260	422	381	35.4

Class2500
Forged steel gate valve



Standards

End Threads: ANSI B 1.20.1
Socked-Weld: ANSI B 16.11
Basic Design: API 602
Test: API 598

Bolted And Welded Bonnet
Sw/Npt/Bw

ASTM A105
Bolted Or Welded Bonnet
OS&Y
Threaded Ends
Rising Stem

Parts and Materials

No	Part Name	Material
1	Body	ASTM A105
2	Bonnet	ASTM A105
3	Wedge	ASTM A182-F6a
4	Stem Nut	ASTM A439-D2
5	Gland Flange	ASTM A105
6	Hand Wheel	Ductile Iron
7	Seat Ring	ASTM A276-410
8	Stem	ASTM A182-F6a
9	Gland	ASTM A276-420
10	Gasket	304SS/Graphite Spiral Wound
11	Packing	Graphite
12	Stud	ASTM A193-B7
13	Nut	ASTM A194-2H
14	Body & Bonnet Nut	ASTM A194-2H
15	Body & Bonnet Stud	ASTM A193-B7
16	Hand Wheel Nut	Carbon Steel
17	Name Plate	Aluminum

- Body material LF2, F5, 304, 304L, 316 and 316L also available.
- Socket-Weld ends on request

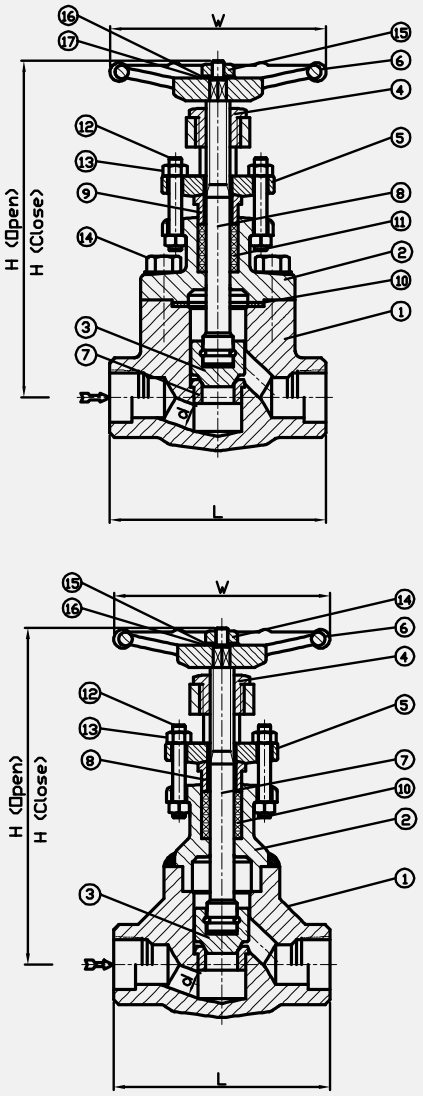
Dimention & Weights Standard Bore - Welded Bonnet

Class	Size	L (mm)	d (mm)	W (mm)	H Open (mm)	H Close (mm)	Weight (Kg)
2500	1/4″	-	-	-	-	-	-
	3/8″	-	-	-	-	-	-
	1/2″	110	10	140	198	178	2.6
	3/4″	127	14	200	225	210	4.0
	1″	127	18	200	243	223	5.9
	1 1/4″	-	-	-	-	-	-
	1 1/2″	150	31	260	387	355	10.0
	2″	240	36.5	350	403	365	29

Dimention & Weights Standard Bore - Bolted Bonnet

Class	Size	L (mm)	d (mm)	W (mm)	H Open (mm)	H Close (mm)	Weight (Kg)
2500	1/4″	-	-	-	-	-	-
	3/8″	-	-	-	-	-	-
	1/2″	110	10	140	212	201	6.1
	3/4″	115	14	200	256	240	8.7
	1″	130	10.2	200	272	260	10.2
	1 1/4″	-	-	-	-	-	-
	1 1/2″	210	31	260	411	380	27.4
	2″	240	36.5	350	422	384	36.2

Class800
Forged steel globe valve



Standards

End Threads: ANSI B 1.20.1
Socked-Weld: ANSI B 16.11
Basic Design: BS 5352
Test: API 598

Bolted And Welded Bonnet
Sw/Npt/Bw

ASTM A105
Bolted Or Welded Bonnet
OS&Y
Threaded Ends
Rising Stem

Parts and Materials

No	Part Name	Material
1	Body	ASTM A105
2	Bonnet	ASTM A105
3	Disc	ASTM A182-F6a
4	Stem Nut	ASTM A439-D2
5	Gland Flange	ASTM A105
6	Hand Wheel	Ductile Iron
7	Seat Ring	ASTM A276-410
8	Stem	ASTM A182-F6a
9	Gland	ASTM A276-420
10	Gasket	304SS/Graphite Spiral Wound
11	Packing	Graphite
12	Stud	ASTM A193-B7
13	Nut	ASTM A194-2H
14	Body & Bonnet Stud	ASTM A193-B7
15	Hand Wheel Nut	Carbon Steel
16	Washer	Carbon Steel
17	Name Plate	Aluminum

- Body material LF2, F5, 304, 304L, 316 and 316L also available.
- Socket-Weld ends on request

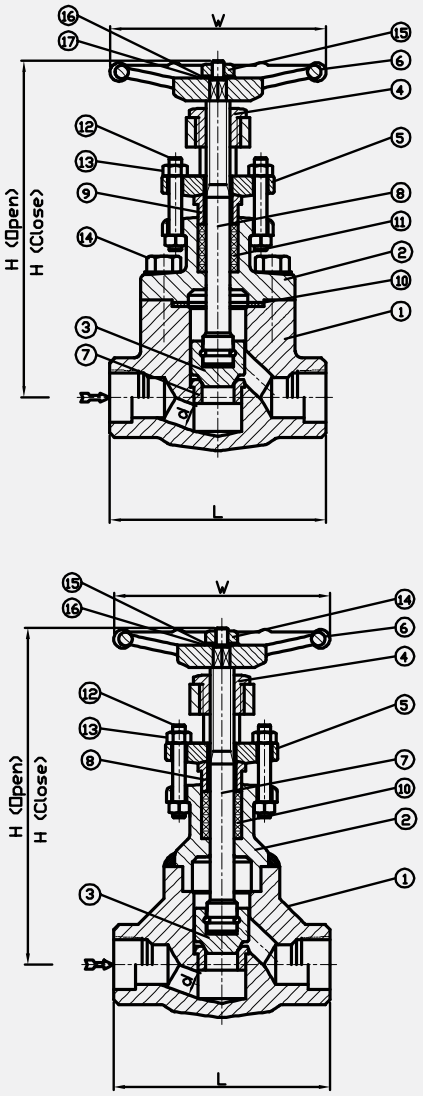
Dimention & Weights Regular Bore

Class	Size	L (mm)	d (mm)	W (mm)	H Open (mm)	H Close (mm)	Weight (Kg)
800	1/4″	-	-	-	-	-	-
	3/8″	-	-	-	-	-	-
	1/2″	80	9	90	152	142	1.7
	3/4″	90	12.5	90	159	146	2.0
	1″	110	17.5	100	182	164	3.2
	1 1/4″	127	22.5	120	214	190	5.3
	1 1/2″	155	28	140	283	253	7.8
	2″	170	32	140	306	273	10.6

Dimention & Weights Full Bore

Class	Size	L (mm)	d (mm)	W (mm)	H Open (mm)	H Close (mm)	Weight (Kg)
800	1/4″	80	6	90	150	143	1.8
	3/8″	80	9	90	152	142	1.8
	1/2″	90	12.5	90	159	146	2.1
	3/4″	110	17.5	100	182	164	3.3
	1″	127	22.5	120	214	190	5.4
	1 1/4″	155	28	140	283	254	7.9
	1 1/2″	170	32	140	306	273	10.7
	2″	210	40	200	327	285	16

Class1500
Forged steel globe valve



Standards

End Threads: ANSI B 1.20.1
Socked-Weld: ANSI B 16.11
Basic Design: BS 5352
Test: API 598

Bolted And Welded Bonnet
Sw/Npt/Bw

ASTM A105
Bolted Or Welded Bonnet
OS&Y
Threaded Ends
Rising Stem

Parts and Materials

No	Part Name	Material
1	Body	ASTM A105
2	Bonnet	ASTM A105
3	Disc	ASTM A182-F6a
4	Stem Nut	ASTM A439-D2
5	Gland Flange	ASTM A105
6	Hand Wheel	Ductile Iron
7	Seat Ring	ASTM A276-410
8	Stem	ASTM A182-F6a
9	Gland	ASTM A276-420
10	Gasket	304SS/Graphite Spiral Wound
11	Packing	Graphite
12	Stud	ASTM A193-B7
13	Nut	ASTM A194-2H
14	Body & Bonnet Stud	ASTM A193-B7
15	Hand Wheel Nut	Carbon Steel
16	Washer	Carbon Steel
17	Name Plate	Aluminum

- Body material LF2, F5, 304, 304L, 316 and 316L also available.
- Socket-Weld ends on request

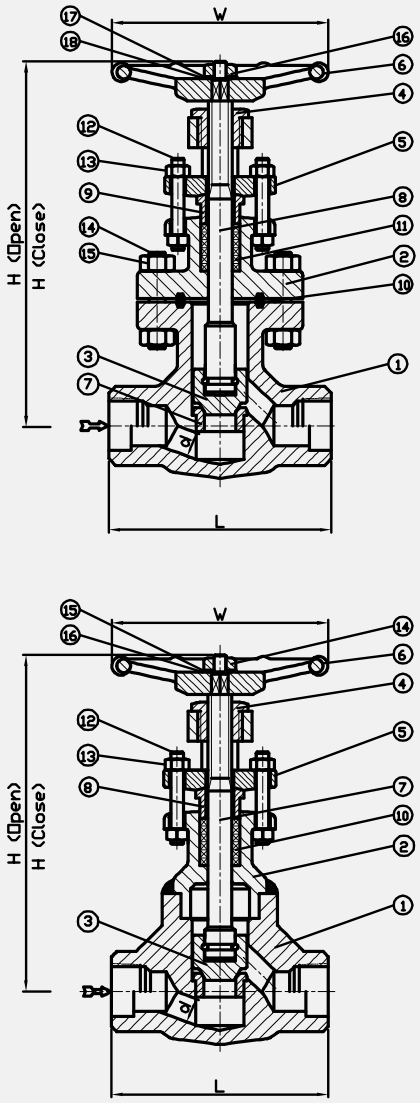
Dimention & Weights Standard Bore - Welded Bonnet

Class	Size	L (mm)	d (mm)	W (mm)	H Open (mm)	H Close (mm)	Weight (Kg)
1500	1/4″	-	-	-	-	-	-
	3/8″	-	-	-	-	-	-
	1/2″	90	11	120	203	190	1.9
	3/4″	110	14.5	175	227	211	3.3
	1″	127	19	175	233	213	5.2
	1 1/4″	-	-	-	-	-	-
	1 1/2″	170	31	200	310	278	10.3
	2″	210	37.5	260	402	363	17.8

Dimention & Weights Standard Bore - Bolted Bonnet

Class	Size	L (mm)	d (mm)	W (mm)	H Open (mm)	H Close (mm)	Weight (Kg)
1500	1/4″	-	-	-	-	-	-
	3/8″	-	-	-	-	-	-
	1/2″	110	11	120	218	-	5.6
	3/4″	115	14.5	175	274	-	8.0
	1″	130	19	175	286	-	9.3
	1 1/4″	-	-	-	-	-	-
	1 1/2″	210	31	260	427	-	31
	2″	240	37.5	260	433	-	37.5

Class2500
Forged steel globe valve



Standards

End Threads: ANSI B 1.20.1
Socked-Weld: ANSI B 16.11
Basic Design: BS 5352
Test: API 598

Bolted And Welded Bonnet
Sw/Npt/Bw

ASTM A105
Bolted Or Welded Bonnet
OS&Y
Threaded Ends
Rising Stem

Parts and Materials

No	Part Name	Material
1	Body	ASTM A105
2	Bonnet	ASTM A105
3	Disc	ASTM A182-F6a
4	Stem Nut	ASTM A439-D2
5	Gland Flange	ASTM A105
6	Hand Wheel	Ductile Iron
7	Seat Ring	ASTM A276-410
8	Stem	ASTM A182-F6a
9	Gland	ASTM A276-420
10	Gasket	304SS/Graphite Spiral Wound
11	Packing	Graphite
12	Stud	ASTM A193-B7
13	Nut	ASTM A194-2H
14	Body & Bonnet Stud	ASTM A193-B7
15	Body & Bonnet Nut	ASTM A194-2H
16	Hand Wheel Nut	Carbon Steel
17	Washer	Carbon Steel
18	Name Plate	Aluminum

- Body material LF2, F5, 304, 304L, 316 and 316L also available.
- Socket-Weld ends on request

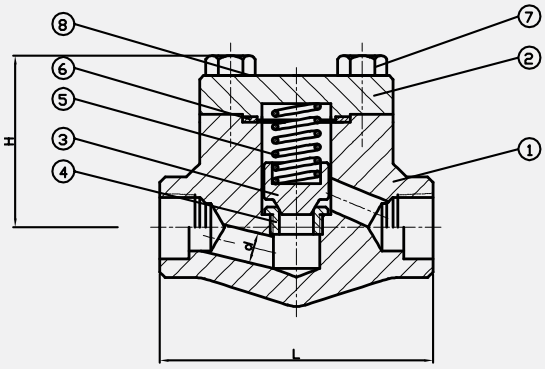
Dimention & Weights Standard Bore - Welded Bonnet

Class	Size	L (mm)	d (mm)	W (mm)	H Open (mm)	H Close (mm)	Weight (Kg)
2500	1/4″	-	-	-	-	-	-
	3/8″	-	-	-	-	-	-
	1/2″	110	10	140	209	198	2.5
	3/4″	127	13	200	238	223	4.1
	1″	155	18	200	257	237	6.2
	1 1/4″	-	-	-	-	-	-
	1 1/2″	210	25	260	386	360	11.8
	2″	240	34	350	407	371	25.0

Dimention & Weights Standard Bore - Bolted Bonnet

Class	Size	L (mm)	d (mm)	W (mm)	H Open (mm)	H Close (mm)	Weight (Kg)
2500	1/4″	-	-	-	-	-	-
	3/8″	-	-	-	-	-	-
	1/2″	110	10	140	218	217	5.8
	3/4″	115	13	200	260	245	8.3
	1″	130	18	200	268	249	9.7
	1 1/4″	-	-	-	-	-	-
	1 1/2″	210	25	260	427	401	26.8
	2″	240	34	350	433	398	34.0

Class800
Forged steel check valve



Standards

End Threads: ANSI B 1.20.1
Socked-Weld: ANSI B 16.11
Basic Design: BS 5352
Test: API 598

Bolted Cover
Sw/Npt/Bw

ASTM A105
Bolted Or Welded Bonnet
OS&Y
Threaded Ends
Piston Type

Parts and Materials

No	Part Name	Material
1	Body	ASTM A105
2	Cover	ASTM A105
3	Disc	ASTM Al 82-F6a
4	Seat Ring	ASTM A276-410
5	Spring	304SS
6	Gasket	304SS/Graphite Spiral Wound
7	Body & Bonnet Stud	ASTM A193-B7
8	Name Plate	Aluminum

- Body material LF2, F5, 304, 304L, 316 and 316L also available.
- Socket-Weld ends on request

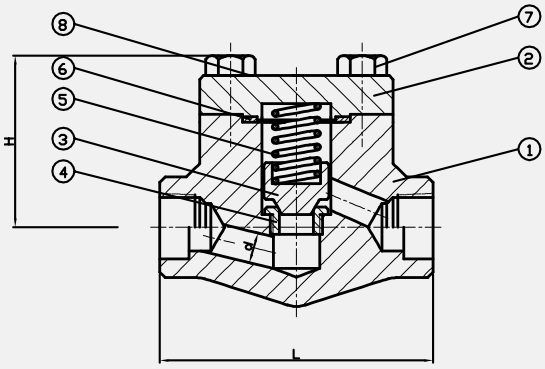
Dimention & Weights Regular Bore

Class	Size	L (rnm)	d (rnm)	H (rnm)	Weight (Kg)
800	1/4″	-	-	-	-
	3/8″	-	-	-	-
	1/2″	80	9	50	1.1
	3/4″	90	12.5	56	1.8
	1″	110	17.5	74	2.6
	1 1/4″	127	22.5	79	3.6
	1 1/2″	155	28	100	5.5
	2″	170	32	109	8.4

Dimention & Weights Full Bore

Class	Size	L (rnm)	d (rnm)	H (rnm)	Weight (Kg)
800	1/4″	80	6.5	50	1.1
	3/8″	80	9	50	1.1
	1/2″	90	12.5	56	1.8
	3/4″	110	17.5	74	2.6
	1″	127	22.5	79	3.6
	1 1/4″	155	28	100	5.5
	1 1/2″	170	32	109	8.4
	2″	210	38	135	11.8

Class1500
Forged steel check valve



Standards

End Threads: ANSI B 1.20.1
Socked-Weld: ANSI B 16.11
Basic Design: BS 5352
Test: API 598

ASTM A105
Bolted Or Welded Bonnet
OS&Y
Threaded Ends
Piston Type

Bolted Cover
Sw/Npt/Bw

Parts and Materials

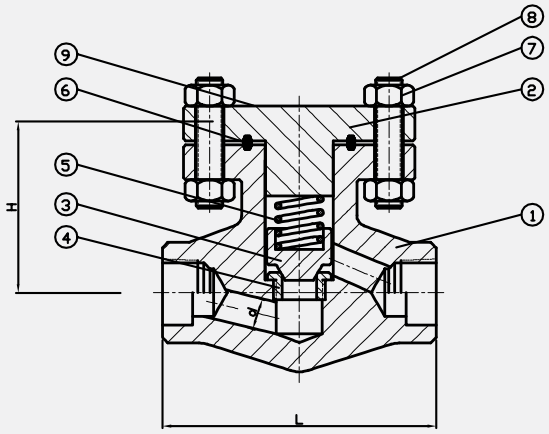
No	Part Name	Material
1	Body	ASTM A105
2	Cover	ASTM A105
3	Disc	ASTM Al 82-F6a
4	Seat Ring	ASTM A276-410
5	Spring	304SS
6	Gasket	304SS/Graphite Spiral Wound
7	Body & Bonnet Stud	ASTM A193-B7
8	Name Plate	Aluminum

- Body material LF2, F5, 304, 304L, 316 and 316L also available.
- Socket-Weld ends on request

Dimention & Weights Standard Bore

Class	Size	L (mm)	d (mm)	H (mm)	Weight (Kg)
1500	1/4″	-	-	-	-
	3/8″	-	-	-	-
	1/2″	110	11	93	3.8
	3/4″	115	14.5	109	5.9
	1″	130	19	122	6.8
	1 1/4″	-	-	-	-
	1 1/2″	210	31	158	18.8
	2″	240	37.5	171	23.7

Class2500
Forged steel check valve



Standards

End Threads: ANSI B 1.20.1
Socked-Weld: ANSI B 16.11
Basic Design: BS 5352
Test: API 598

Bolted Cover
Sw/Npt/Bw

ASTM A105
Bolted Or Welded Bonnet
OS&Y
Threaded Ends
Piston Type

Parts and Materials

No	Part Name	Material
1	Body	ASTM A105
2	Cover	ASTM A105
3	Disc	ASTM A182-F6a
4	Seat Ring	ASTM A276-410
5	Spring	304SS
6	Gasket	304SS/Graphite Spiral Wound
7	Body & Bonnet Stud	ASTM A193-B7
8	Body & Bonnet Nut	ASTM A194-2H
9	Name Plate	Aluminum

- Body material LF2, F5, 304, 304L, 316 and 316L also available.
- Socket-Weld ends on request

Dimention & Weights Standard Bore

Class	Size	L (mm)	d (mm)	H (mm)	Weight (Kg)
2500	1/4″	-	-	-	-
	3/8″	-	-	-	-
	1/2″	110	10	93	4.0
	3/4″	115	13	109	6.2
	1″	130	18	122	7.2
	1 1/4″	-	-	-	-
	1 1/2″	210	19.4	158	19.4
	2″	240	24.5	171	24.5

Wellhead gate valves API 6A

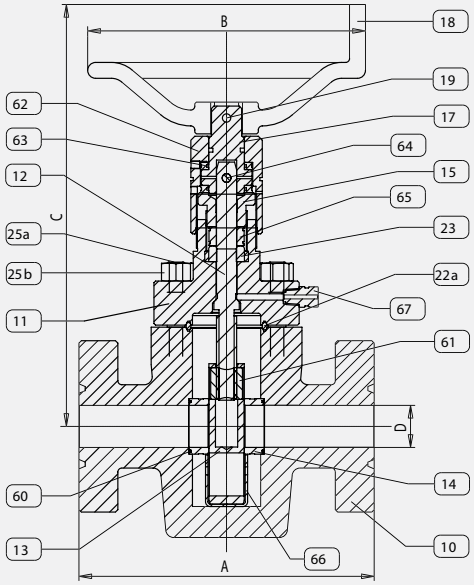
Introduction

- Our Wellhead gate valves are full bore and block and bleed type.
- GSS can supply valves with P.T.F.E. insert seats or full metal to metal seals to meet fire safe test.
- If requested stem packing can be suitable up to 520 °C service temperature.
- Valves can be supplied in manual, gear operator, electrical operator, hydraulic operator, gas over oil operator.
- Trim materials according to service requirements.
- API 10.000 available on request.

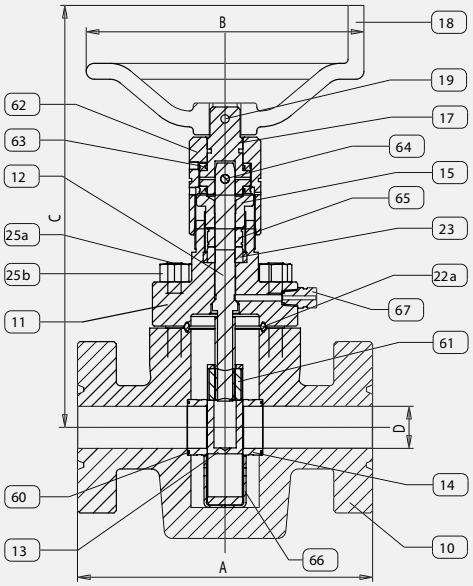
Class3000-5000-10000

Wellhead gate valve API 6A

Class 3000



Class 5000



Standard execution with stem-greaser

10) Body
11) Bonnet
12) Stem
13) Wedge
14) Seats
15) Packing gland
17) Stem nut
18) Handwheel
19) Handwheel plug
228) Rj gasket
23) Packing
25a) Body stud bolts
25b) Body nuts
60) Seats gasket
61) Lift nut
62) Bearings support
63) Bearing
64) Stem plug
65) Packing ring
66) Wedge slide
67) Greaser

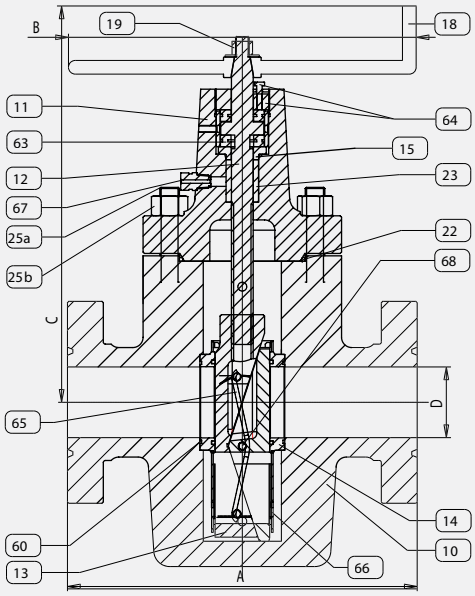
Dimesnion Expanding And Wellhead Gate Valve Api Gal Api Go (Rating 3000 Psi)

Nominal Size	2 1/16"		2 9/16"		3 1/8"		4 1/16"	
	mm.	in.	mm.	in.	mm.	in.	mm.	in.
A (End to end)	371	14.5/8"	422	16.5/8"	435	17.1/8"	511	20.1/8"
B (Diameter Handwheel)	350	13	350	13	500	20	500	20
C (Center line top)	500	19.5/8"	525	20.5/8"	580	23	675	26.5/8"
D (Diameter of Port)	52,4	2.1/16"	65,1	2.9/16"	79,4	3.1/8"	103,2	4.1/16"
Approxim. Weight (Kg./lb.)	80	176	100	220	140	308	280	617

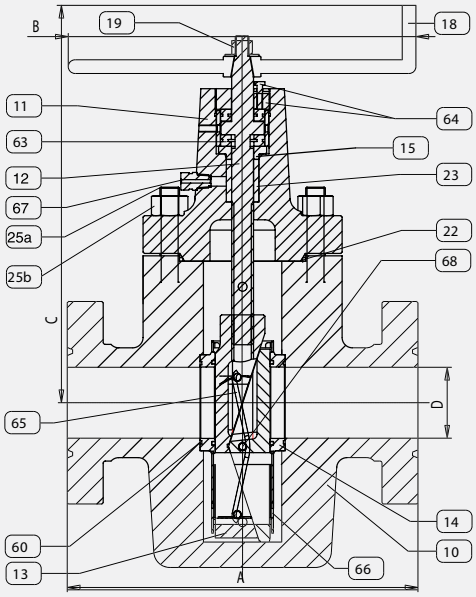
Class3000-5000-10000

Wellhead gate valve API 6A

Class 3000



Class 5000



Standard execution with stem-greaser

10) Body
11) Bonnet
12) Stem
13) Gate assembly
14) Seats
15) Packing gland
18) Handwheel
19) Handwheel nut
22) Gasket
23) Packing
258) Body stud bolts
25b) Body nuts
60) Seats gasket
63) Thrust bearing
64) Set screw and set nut
65) Spring
66) Wedge slide
67) Greaser
68) Pin

Dimesnion Expanding And Wellhead Gate Valve Api Gal Api Go (Rating 5000 Psi)

Nominal Size	2 1/16"		2 9/16"		3 1/8"		4 1/16"	
	mm.	in.	mm.	in.	mm.	in.	mm.	in.
A (End to end)	371	14.5/8"	422	16.5/8"	473	18.5/8"	549	21.5/8"
B (Diameter Handwheel)	350	13	350	13	500	20	500	20
C (Center line top)	500	19.5/8"	525	20.5/8"	580	23	675	26.5/8"
D (Diameter of Port)	52,4	2.1/16"	65,1	2.9/16"	79,4	3.1/8"	103,2	4.1/16"
Approxim. Weight (Kg./lb.)	80	176	100	220	150	330	300	660

Control valves

General Description

GSS company has started the cooperation to produce the control Valves with WUZHONG Instrument company. It contains of a valve connected to an actuator mechanism that is capable of changing the position of a Flow Controlling Element with the valve in response to a SIGNAL from Controlling System.

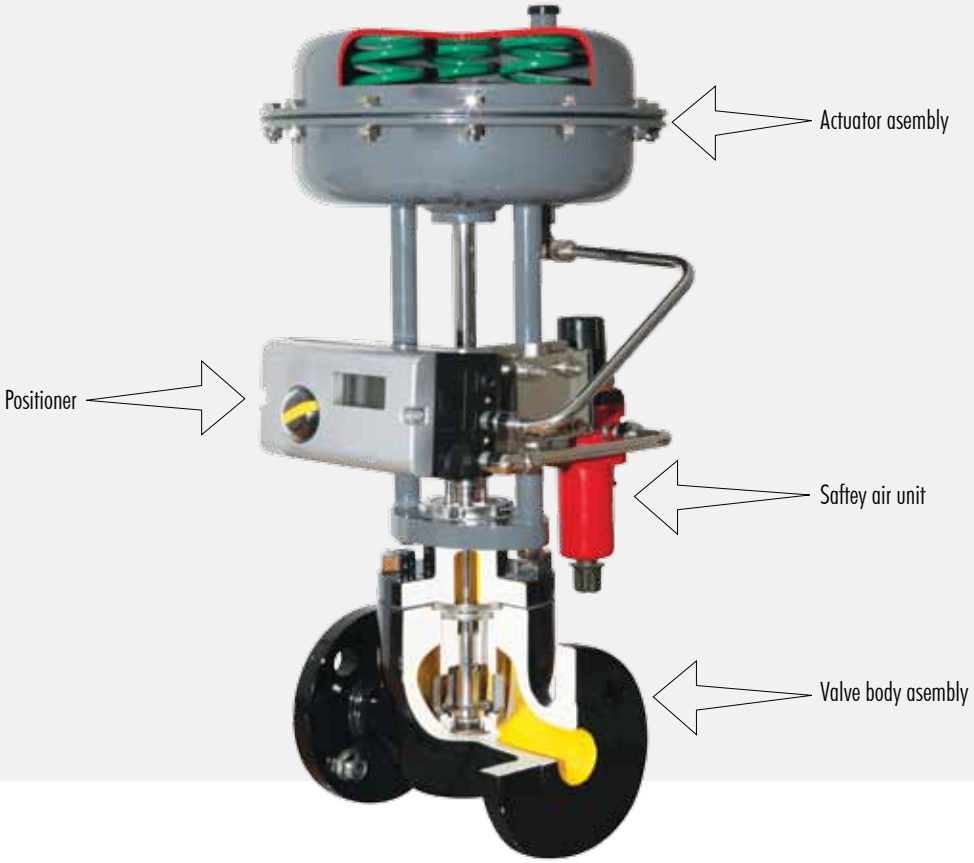
Project Partners
Know How Agreement

It is consist of three major Sub- assemblies:

- The valve body assembly.
- An actuator assembly.
- Variety of additional valve accessories such as POSITIONER.

The Power Sources could be:

- Manual (Lever or Gear Box)
- Pneumatic
- Hydraulic
- Electric

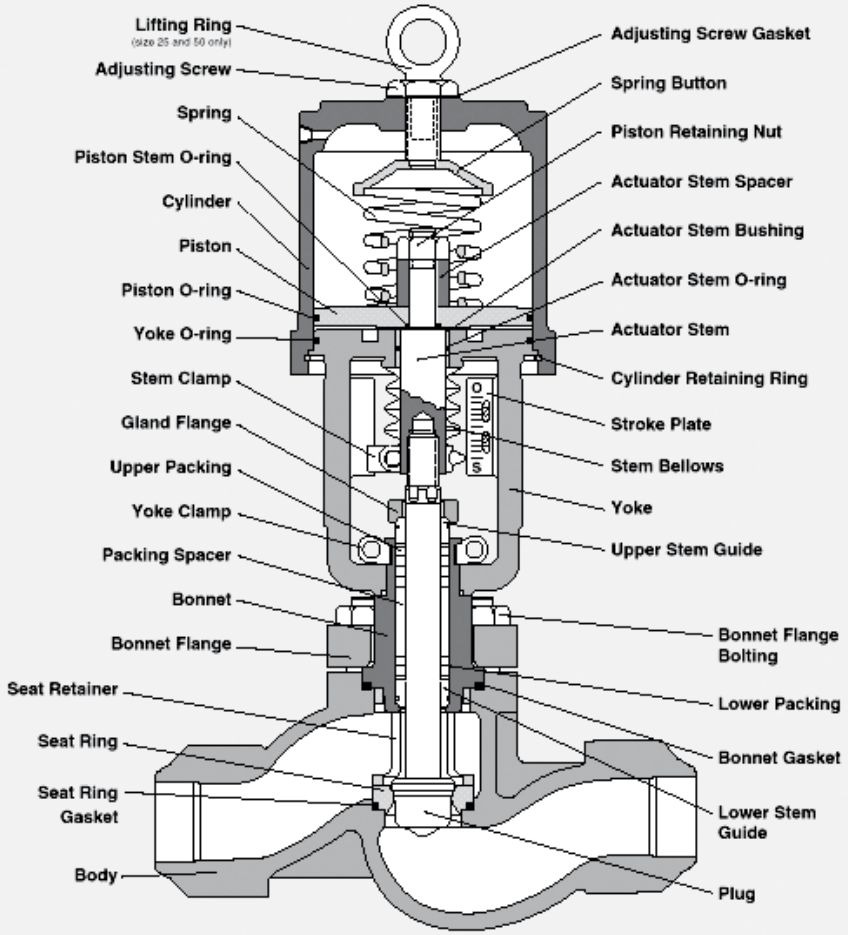


Range of production

Valve Type	Single Seat, Cage Sleeve design, Bellows Seal, Cryogenic Service										
Size	Inch	1"	1½"	2"	3"	4"	6"	8"	10"	12"	16"	20" & Laregr
	DN	24	40	50	80	100	150	200	250	300	400	500 & Larger
Pressure Class	150, 300, 600, 900, 1500 & Larger										
End Connection	Flanged (RF/FF, RTJ), Butt weld, Socket Weld										
Material	Carbon Steel (WCB, A105, A352 LF2, etc)										
	Staninless Steel (CF8M, WC6, C5, C15, etc)										
	Al. Brunze (C95800, C95200)										
Leakage Class	III, IV, V, VI										

Control valve components

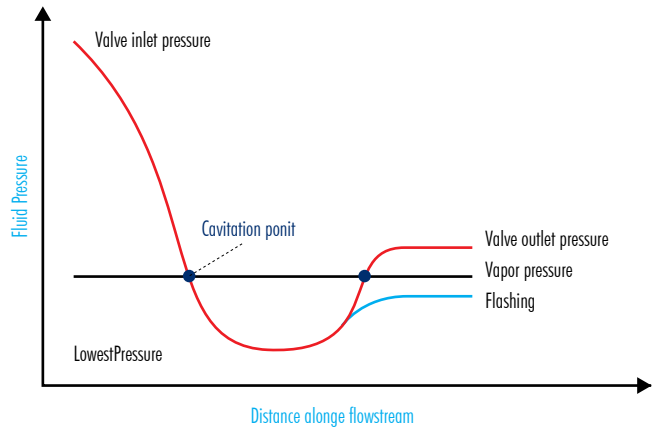
Although there are so many types and make of control valves, this drawing can be used to illustrate the location and description of the different component of Control Valves. The main difference mainly will be the type of actuator used by different manufacturers.



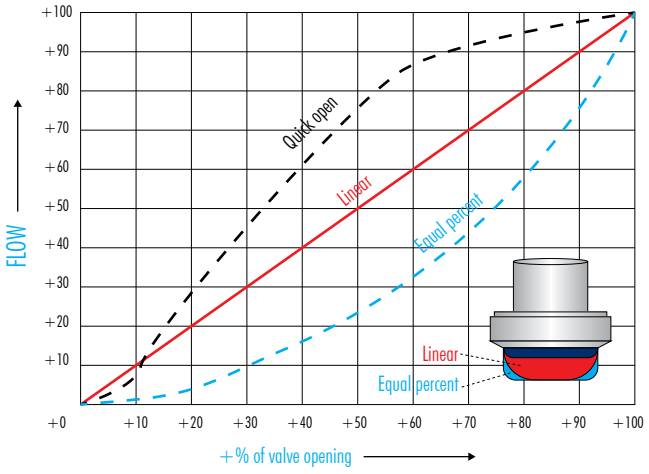
Control valve characteristics

Control valve flow characteristics is the relationship between flow rate through the valve and valve travel as the travel is varied from 0 to 100%.

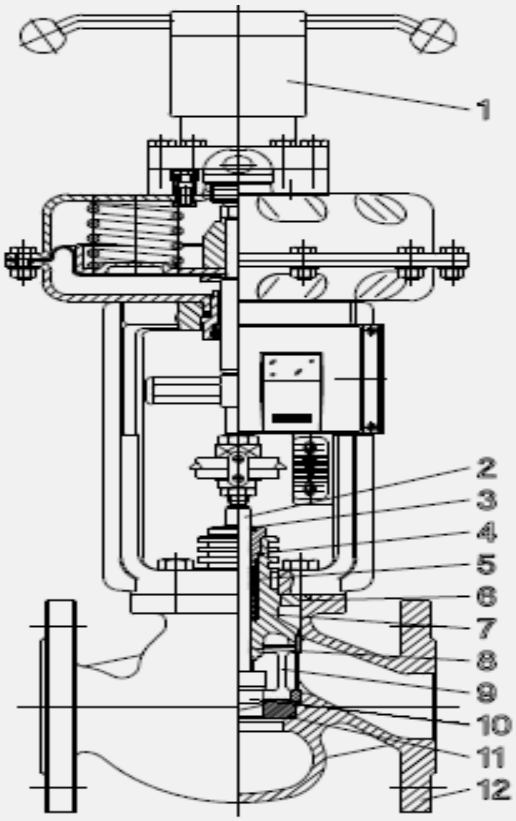
CV: The valve flow coefficient is the number of U.S. gallons per minute of 60 degree F water that will through a valve at a specified opening with a pressure drop of 1 psi across the valve.



Flow characteristics curves



A Series
Single Seat Globe Type

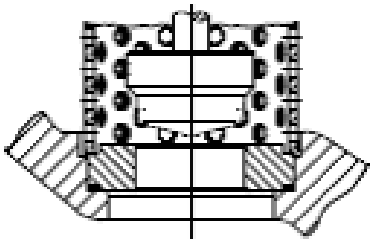


General Drawing and Part List

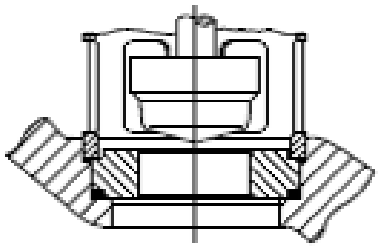
1. Actuator with Hand well
2. Stem
3. Packing Gland
4. O-Ring
5. Packing
6. Bonnet
7. Stud
8. Gasket
9. Cage
10. Plug
11. Seat
12. Body

Valve Type	Single Seat Globe Type Control Valve (Cage Sleve,Contuored, Perforated,Bellows Seal,Cryogenic,Extended Stem)													
Size	Inch	1″	1 ½″	2″	3″	4″	6″	8″	10″	12″	14″	16″	18″	20″	24″
	DN	25	40	50	80	100	150	200	250	300	350	400	450	500	600
Pressure Rating(Class)	PN 10 , 16, 25, 40, 63, 100, 160, 250													
	ANSI 150, 300, 600, 900, 1500													
Connection	Flange (RF,PE,RTJ) &Welded End (SW up to 50mm ,BW 50mm and above)													
Body Material	Cast and Forge Carbon Steel (A216 WCB,WCC,A105N,A352 LF2,A350 LCB,…)													
	Cast and Forge Stainless Steel (CF8M,WC6,C5,C12,F316L,F304,F321,…)													
	Al.Brunze (C95800,C95200)													
Trim Material	Stainless Steel , Stainless Steel + Stellited, Tungsten Carbide													
Leakage Class	III,IV,V,VI													

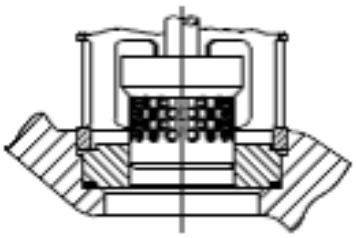
The structure characteristics of deferent type of plugs



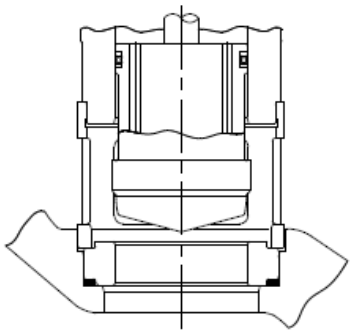
1. Metal-seated quick-changeable trim combination.
2. Resistance to erosion by cavitations.
3. Low noise level.



- Metal-seated quick-exchangeable trim combination.
- Insensitive to impurities and relative good resistance against cavitation.

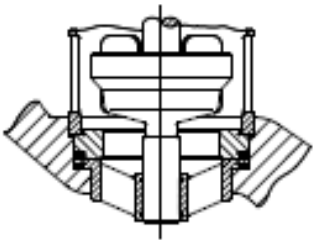


- Metal-seated quick-changeable trim combination.
- Particularly effective for liquids and compressible fluids at high pressure drop ratios.
- The flow, directed through the holes of the trim, is divided into numerous jets of cavitating liquid and decrees of damage.
- Low Noise level.

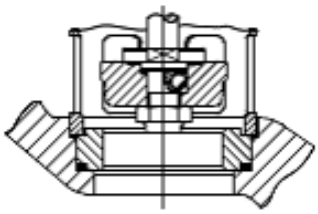


Valves with balanced trims need clearly lower control forces than valves without balancing. As sealing elements we offer:

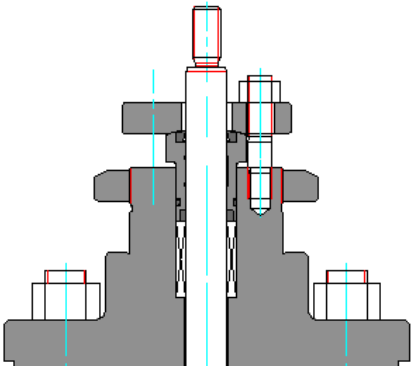
- Metallic piston rings
- Elastomer Quadrings with PTFE support
- Pure graphite



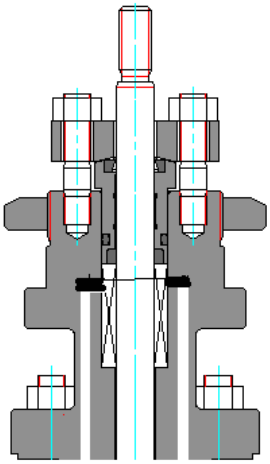
Double guide, High pressure drop ,Contoured plug.



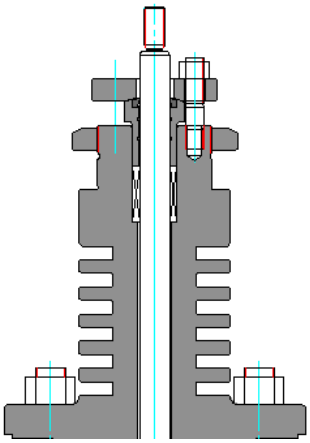
High capacity flow passage trim.



- Standard Bonnet (-46C～200C)



- Bellows type with double sealing security



- Fin-extension type For high temperature (300C-530C)

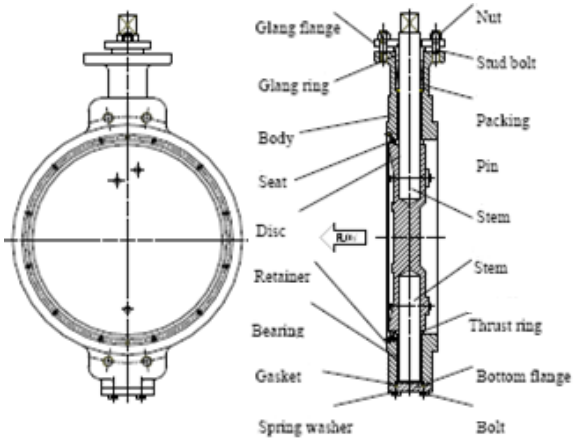
WB Series
High Performance Butterfly Type


WB 300


WB 310

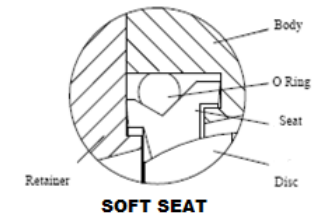

WB 410


WB 320

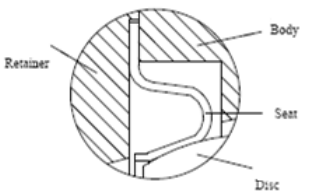


WB300 High Performance Butterfly Valve

is designed as a kind of new style butterfly valve which is based on advantage of several butterfly valves with different structured. The sealing face can be supplied with one of soft and metal construction, it's a spherical surface which will help the sealing reach a real dynamic sealing. Therefore, it has an excellent performance of shutting off and duration, additionally small in volume, light in weight, high scopes of manufacture and easier in repair and maintenance system, or to control the flow.



SOFT SEAT



METAL SEAT

Valve Type	Butterfly Valve (Soft Seat , Metal Seat)	
Size	Inch	2" To 40"
	DN	50mm to 1000mm
Pressure Rating(Class)	PN 10 , 16, 25, 40	
	ANSI 150, 300	
Connection	Wafer For WB 300,310 & Flange RF for WB 410	
Body Material	Cast Carbon Steel (A216 WCB,WCC,A350 LCB,…)	
	Cast and Forge Stainless Steel (CF8M,WC6,C5,C12,…)	
	Al.Brunze (C95800,C95200)	
Trim Material	Stainless Steel ,Al.Brunze	
Leakage Class	III,IV,V,VI	

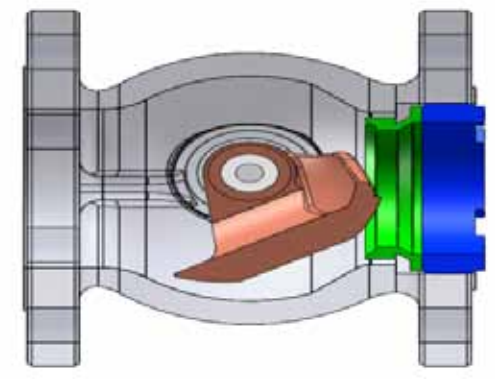
WB310 Triple offset butterfly valve

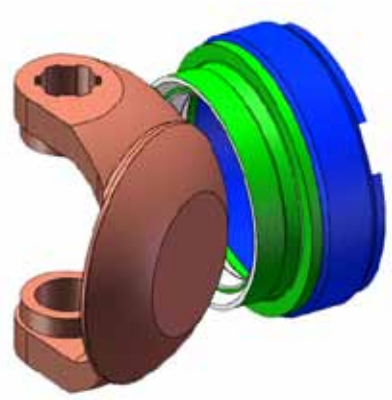
Characterized by the structure of Triple offset, WB310 series butterfly valve has dramatic excellence that there has no friction on the sealing surface when the valve opens and closes. Torsional sealing can come true by systemic pressure. Additionally with lower torque, Based on excellent sealing performance and the ability to run for a long period of time, the triple eccentric butterfly valve is generally applicable to the fields of metallurgy, petroleum, chemical industry, paper making, natural gas, offshore platform, municipal water supply and drainage to open or close the pipeline

The first offset: Pipe has an eccentricity at axial direction against rotary shaft to let the sealing surface has a sequence of 360°. The second offset: Pipe has an eccentricity at radial direction against rotary shaft to bring cam wheel domino offset and therefore eliminate 80% friction between disc and seat at the scope of turn.

The third offset: the sealing surface of the disc has been changed from sphere to cone and create a deflection angle to eliminate the rest friction.

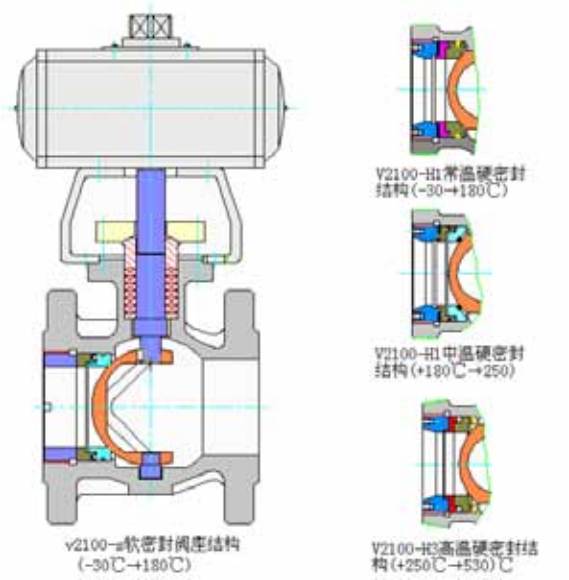
VFR Series
Eccentric Rotary Control Valve





VFR control valve is a new rotary valve

The valve invorporates an eccentrically mounted plug and minimizes amount of moving contact of the plug with the seat .reducing seat and increasing long seat life. The plug with a diversion wing provides stabilize operation at all points in travel range. Also, the valve features high flow capacity and rangeability



Valve Type	Rorary Globe Valve	
Size	Inch	1″ To 12″
	DN	25 mm to 300 mm
Pressure Rating(Class)	PN 10 , 16, 25, 40	
	ANSI 150, 300,600	
Connection	Flange RF	
Body Material	Cast Carbon Steel (A216 WCB,WCC, A350 LCB,…)	
	Cast Stainless Steel (CF8M,WC6,C5,C12,…)	
	Al.Brunze (C95800,C95200)	
Trim Material	Stainless Steel ,Al.Brunze	
Leakage Class	III,IV,V,VI	

Professional Valve Reconditioning Center

History

Professional Valve Reconditioning Center (PVRC) has been established to support the customers need regarding to valve reconditioning & repairing.
PVRC with confidence in its resources, recondition various types of metallic valves applied in oil, gas, Petrochemical and Power Industries, while observing international standards such as API, DIN, BS, ANSI/ ASME and ISO.

Capabilities

PVRC, is the first recondition company for industrial metallic valves capable of repairing industrial metallic valves with various sizes and in any pressure classes such as Gate, Globe, Check, Through Conduit, Plug, Ball, Control and Safety Relief Valves. To do so, PVRC relies on its know-how and the most skillful technicians.
At present, PVRC is proud of reconditioning thousands of valve units belonging to the various companies affiliated Oil & Gas Industries.

Do you know that?

- Oil, gas and petrochemical valves can be reconditioned up to three times according to international
- standards. Standard valve repair means life increase of valve for about more 20 service years.
- For quality assurance, PVRC commits to guarantee reconditioned valves at least 18 months after
- delivery date and one year after being put into service conditions.
- PVRC reconditioned several 32" & 24" safety valves belonging to Imam Khomeini AGRI. Industry
- INC. and in this way took another great step toward saving national wealth.
- PVRC is honored to serve our country by gloriously reconditioning several Ball Valves in various sizes
- and with different pressure classes up to 1500 psi.

By standard valves:

- Organization productivity will be increased.
- Valve efficiency will be upgraded.

Some of our customers, whose valves were reconditioned by PVRC are as follows:

1- National Iranian South Oil Company
2- National Iranian Central Oil Company
3- National Iranian Offshore Oil Company
4- Oil Pipeline and Telecommunication Company
5- Oil Terminal Company
6- National Iranian Oil Products Distribution Company
7- National Iranian Oil Products Distribution Company - Qom District
8- National Iranian Oil Products Distribution Company - Qazvin District
9- National Iranian Oil Products Distribution Company - Mashhad District
10- Abadan Refinery Company
11- Tabriz Refinery Company
12- Kermanshah Refinery Company
13- Lavan Refinery Company
14- Bandar Abbas Refinery Company
15- Isfahan Refinery Company
16- National Iranian Gas Company
17- GTO District 3
18- GTO District 4
19- GTO District 5
20- GTO District 6
21- GTO District 8
22- Ourmieh Petrochemical Company
23- Arak Petrochemical Company (Overhaul 2004)
24- Shiraz Petrochemical Company
25- Imam Khomeini Petrochemical Company
26- Razi Petrochemical Company

27- Imam Khomeini AGRI. Industry INC.
28- Azarab Industries Co.
29- Fuel Consumption Optimization Org.
30- South Pars Power Generation Management Co.
31- Shahid Mofateh Power Generation Management Co.
32- Ahvaz Pipe Mills Co.

Appendix - I

Pressure-Temperature Ratings For Selected Shell Materials. ASME B16.34

Pressure Class		150	300	600	900	1500
Hydrostatic Shell Test Pressure (PSI G)		450	1125	2225	3350	5625
Seat Test Pressure (PSI G)		315	815	1630	2475	4125
Working Temp.(Deg. F)		Maximum Non-Shock Working Pressure (PSIG) Standard Class Valves				
-20 - 100	WCB	285	740	1480	2220	3750
	LCB	265	695	1390	2085	3470
	CF8M	275	720	1440	2160	3600
	CF8	275	720	1440	2160	3600
200	WCB	260	675	1350	2025	3375
	LCB	250	655	1315	1970	3280
	CF8M	235	620	1240	1860	3095
	CF8	230	600	1200	1800	3000
300	WCB	230	655	1315	1970	3280
	LCB	230	640	1275	1915	3190
	CF8M	215	560	1120	1680	2795
	CF8	205	540	1080	1620	2700
400	WCB	200	635	1270	1900	3170
	LCB	200	620	1235	1850	3085
	CF8M	195	515	1025	1540	2570
	CF8	190	495	995	1490	2485
500	WCB	170	600	1200	1795	2995
	LCB	170	585	1165	1745	2910
	CF8M	170	480	955	1435	2390
	CF8	170	465	930	1395	2330
600	WCB	140	550	1095	1640	2735
	LCB	140	535	1065	1600	2665
	CF8M	140	450	900	1335	2255
	CF8	140	435	875	1310	2185
650	WCB	125	535	1075	1610	2685
	LCB	125	525	1045	1570	2615
	CF8M	125	445	890	1330	2220
	CF8	125	430	860	1290	2150
700	WCB	110	535	1065	1600	2665
	LCB4	110	520	1035	1555	2590
	CF8M	110	430	870	1305	2170
	CF8	110	425	850	1275	2125
750	WCB	95	505	1010	1510	2520
	LCB4	95	475	945	1420	2365
	CF8M	95	425	855	1280	2135
	CF8	95	415	830	1245	2075
800	WCB	80	410	825	1235	2060
	LCB4	80	390	780	1175	1955
	CF8M	80	420	845	1265	2110
	CF8	80	405	805	1210	2015
850	WCB3	65	270	535	805	1340
	LCB4	65	270	535	805	1340
	CF8M	65	420	835	1255	2090
	CF8	65	395	790	1190	1980

Appendix - II

Guide to selection of correction resistant materials for industrial valves

Key: E: Excellent G: Good F: Fair N: Not Recommended - : Information Lacking **Fluid Handled**	Carbon Steel	Stainless Steel (18-10 Mo)	Stainless Steel (18-8)	Stainless Steel (13% Cr)	Ni-Resist Type 2	Nickel Alloy	Monel - Inconel	Hastelloy
Acetaldehyde	N	E	E	-	-	-	-	E
Acetate solvents	F	G	-	G	-	G	E	-
Acetic acid (glacial)	N	E	-	G	F	G	E	-
Acetic anhydride	N-F	G-E	G	E	F	E	E	E
Acetone	G-E	E	E	E	G	E	E	E
Acetylene	E	E	E	-	G	E	E	E
Acetylene	G	E	-	E	-	-	E	-
Air	E	E	E	-	-	-	-	-
Alcohols	G	E	E	E	G	E	E	E
Alum potash	N	E	-	N	G	F	E	-
Aluminium acetate	N	E	E	-	-	-	G	E
Aluminium oxalate	N	-	-	-	-	-	E	G
Aluminium potassium sulphate	N	E	E	-	-	-	G	G
Amines	G	E	E	-	-	-	-	-
Ammonia gas	E	E	-	E	E	N	N-F	-
Ammonium bicarbonate	F	G	G	-	-	-	-	-
Ammonium carbonate	G	G	G	G	E	N	N	G
Ammonium chloride	N	F	F	N	G	F	F-G	G
Ammonium hydroxide	E	E	-	E	E	N	N-F	-
Ammonium hydroxide (28%)	N	G	G	-	-	-	-	E
Ammonium hydroxide (conc)	N	G	G	-	-	-	-	E
Ammonium monophosphate	N	G	G	-	-	-	-	E
Ammonium nitrate	N	G	G	-	-	-	-	E
Ammonium phosphate	N	G	G	-	-	-	-	E
Ammonium sulfate	N-F	F-G	-	N	G	G	G	G
Amyl acetate	F	G-E	G	G	-	E	G-E	G
Antimony trichloride	N	N	N	-	-	-	G	E
Arsenic acid	N	G	G	-	-	-	-	-
Asphalt	G	E	-	E	-	E	E	-
Asphalt emulsion	G	E	E	-	-	-	-	-
Asphalt liquid	G	E	E	-	-	-	-	-
Barium carbonate	G	E	E	-	-	-	-	E
Barium sulfide	F	G	G	-	-	-	-	-
Beet suger liquors	G	E	E	G	G	E	E	-
Benzene (benzol)	G	E	E	-	-	-	G	G
Benzine	E	E	-	E	E	E	E	-
Benzoid acid	N	E	E	-	-	-	G	E
Borac acid	N	G	G	-	-	-	G	E
Borax liquors	F	E	E	-	-	-	G	E
Boric acid	N	G	-	F	-	-	G	-
Butadiene	F	N	G	-	-	-	-	-
Butyric acid	N	G	G	-	-	-	G	E
Calcium chloride	F	G	F	-	-	-	G	E
Calcium chloride acid	N	G	-	F	F	F	G	-
Calcium chloride alkaline	F	F	-	F	G	E	E	-
Calcium hydroxide	F	E	E	-	-	-	E	-
Calcium hypochlorite	N	F	F	N	N	G	F	E
Calcium sulfate	N	E	E	-	-	-	G	G
Carbonic acid	N	G	G	-	-	-	G	E
Carbon bisulfide	G	G-E	G	E	F	-	G	-
Carbon dioxide dry	G	E	-	E	E	E	E	-
Carbon dioxide wet	N	E	-	F	F	E	E	-
Carbon tetrachloride	F	F	-	N	G	G	G	-
Carbonated water	N	E	E	-	-	-	G	E
Carbonic acid	N	G	G	-	-	-	E	E
Chromic acid	N	G-E	E	F	N	F	G	E
Citrus juices	N	E	E	-	-	-	G	E
Coca-cola syrup (pure)	N	E	E	-	-	-	-	-
Copper nitrate	N	E	E	-	-	-	N	E
Copper sulfate	N	G	G	-	-	-	E	G
Cottonseed oil	F-G	G-E	G	G	-	G	G-E	G
Creosote	G	E	-	G	E	G	G	-

Key: E: Excellent G: Good F: Fair N: Not Recommended - : Information Lacking **Fluid Handled**	Carbon Steel	Stainless Steel (18-10 Mo)	Stainless Steel (18-8)	Stainless Steel (13% Cr)	Ni-Resist Type 2	Nickel Alloy	Monel - Inconel	Hastelloy
Creosote oil	G	G	G	-	-	-	E	E
Cresylic acid	F	G	G	-	-	-	G	G
Cupric chloride	N	N	N	-	-	-	E	N
Diesel fuels	E	E	E	-	-	-	E	-
Dowtherm	G	E	E	-	-	-	-	-
Drying oil	-	G	G	-	-	-	-	G
Epsom salt	F	G	G	-	-		-	-
Ferric chloride	N	N	N	-	-	-	E	N
Ferric nitrate	N	G	G	-	-	-	E	N
Ferric sulfate	N	G	G	F	N	-	E	-
Formaldehyde	N	F-G	N	G	-	G	G-E	F
Formic acid	N	G-E	F	F	-	F	G-E	G
Fuel oil	G	E	E	E	E	G	G-E	G
Gallic acid	N	E	E	-	-	-	E	E
Gas-natural	G	E	E	-	-	-	-	-
Gasoline (leaded)	E	E	E	-	-	-	-	E
Gasoline (unleaded)	E	E	E	-	-	-	-	E
Gasoline refined	E	E	-	E	E	E	E	-
Heptane	N	N	N	-	-	-	E	G
Hydrocarbons	N	N	N	-	-	-	G	F
Hydrochloric acid	N	N	-	N	N	N	N	-
Hydrochloric acid (air free)	N	N	N	-	-	-	G	F
Hydrofluoric acid	N	N	N	N	F-N	F	G-E	G
Hydrogen peroxide USP	-	F	-	F	F	N	G	-
Hydroxide	N	E	E	-	-	-	-	G
Hypo (sodium thisosulfate)	N	E	E	-	-	-	-	G
Ink	-	E	G	-	-	-	G	G
Iodine (wet)	-	N	N	-	-	-	E	F
Isopropyl alcohol	-	G	G	-	-	G	-	-
Kerosene	G	E	E	-	-	-	E	G
Ketchup	N	E	E	-	-	-	E	G
Lacquers	G	E	-	E	-	E	E	-
Lactic acid	N	E	E	-	-	-	E	G
Large oil	-	G	E	-	-	-	-	G
Linseed oil	E	E	E	E	-	E	E	E
Liquros, paper pulp mills	-	-	-	-	-	-	-	-
Liquors, paper pulp mills black Liquors	G	E	-	F	G	G	G	-
Lubricating oil	E	-	-	-	-	-	-	-
Magnesium hydroxide	G	E	E	G	E	E	E	G
Mercuric chloride	-	-	-	-	-	-	E	-
Mercury	E	E	E	-	-	-	E	G
Methyl alcohol	G	G	G	-	-	-	-	E
Methyl chloride	G	E	G	-	-	-	G	G
Methyl chloride	G	G	-	G	G	G	G	-
Methyl ethyl ketone	E	E	E	-	-	-	-	E
Milk	N	E	E	G	N	G	E	G
Mine water (acid)	-	G	G	-	-	-	E	N
Mineral oil	-	-	E	-	-	-	-	-
Molasses, adible	F	E	E	-	-	-	E	G
Mustard	N	E	F	-	-	-	E	G
Naphtha	G	E	E	-	-	-	E	E
Natural gas	G	E	-	E	E	E	E	-
Nitric acid	N	G	-	N	F	N	N	-
Nitrobenzene	G	G	G	-	-	-	-	G
Nitrous oxide	G	G	G	-	-	-	-	N
Oleic acid	N-F	E	G	N	G	F	G	G
Olive oil	-	E	E	-	-	-	-	-
Oxalic acid	N	E	E	-	-	-	G	G
Palmitic acid	-	G	G	-	-	-	-	G
paraformaldehyde	G	G	G	-	-	-	-	G
Penicilin	N	G	N	-	-	-	-	E
Pentane	G	E	E	-	-	-	G	G

This table continues on next page.

Appendix - II
Guide to selection of correction resistant materials for industrial valves

Key:
E: Excellent
G: Good
F: Fair
N: Not Recommended
- : Information Lacking

Fluid Handled	Carbon Steel	Stainless Steel (18-10 Mo)	Stainless Steel (18-8)	Stainless Steel (13% Cr)	Ni-Resist Type 2	Nickel Alloy	Monel - Inconel	Hastelloy
petrolatum	-	G	G	-	-	-		-
Petrolatum oils refined	E	E	-	E	E	E	E	-
Phenol	N	E	E	-	-	-	E	E
Phenol crude	N	E	-	N	F-G	G	E	-
Phenol UDP	E	E	-	E	E	E	E	-
Phthalic acid	-	G	G	-	-	-	-	-
Picric acid	N	E	E	-	-	-	E	G
Pine oil	G	E	E	-	-	-	-	-
Potassium chlorate	G	G	G	-	-	-	-	-
Potassium chloride	F	F	F	-	-	-	G	G
Potassium cyanide	G	G	G	-	-	-	G	G
Potassium dichromate	F	G	G	-	-	-	E	-
Potassium diphosphate	-	E	-	-	-	-	-	-
Potassium frricyanide	F	G	G	-	-	-	G	G
Potassium frrocyanide	F	G	G	-	-	-	G	G
Potassium hydroxide	F-G	G-E	G	G	E	F	E	E
Potassium iodide	F	G	G	-	-	-	-	G
Potassium nitrate	E	G	G	-	-	-	G	G
Potassium permanganate	G	G	G	-	-	-	E	-
Potassium sulfate	G	G	G	-	-	-	G	G
Propane	G	G	G	-	-	-	-	G
Propane gas	E	E	-	E	E	E	E	-
Pyrogailic acid	G	E	E		-	-	E	G
Pyroligneous acid	-	E	-	G	G	-	F	-
Rosin emulsion	F	G	G	-	-	-	-	E
Salad oil	F	G	G	-	-	-	-	G
Salicylic acid	N	G	G	-	-	-	G	G
Sea water	N	E	E	-	-	-	G	E
Silver nitrate	N	G	G	-	-	-	G	N
Sodium acetate	F	G	G	-	-	-	G	F
Sodium aluminate	-	G	G	-	-	-	G	G
Sodium be carbonate	F	G	G	-	-	-	G	G
Sodium be carbonate (10%)	F	E	-	E	G	G	G	-
Sodium bisulfate (10%)	N	E	E	-	-	-	G	G
Sodium bisulfite	N	E	E	-	-	-	G	G
Sodium borate	-	G	G	-	-	-	G	G
Sodium bromide (10%)	G	G	F	-	-	-	G	G
Sodium carbonate	G-E	G-E	G	E	E	E	G	-
Sodium chlorate	-	G	G	-	-	-	G	-
Sodium chloride	N-F	F-G	G	N	G	G	G-E	G
Sodium chromate	G	-	-	-	-	-	-	G
Sodium cyanide	G	G	G	-	-	-	-	G
Sodium fluoride	N	G	F	-	-	-	F	E
Sodium hydroxide	F-G	G-E	G	G	E	F	E	E
Sodium hypo chlorite	N	F-G	N	N	N	N	E	N
Sodium nitrate	G	G	G	-	-	-	G	G
Sodium nitrate	G	E	-	E	G	G	G	
Sodium per borate	G	G	G	-	-	-	G	G
Sodium peroxide	F	G	G	-	-	-	G	G
Sodium phosphate	F	G	G	-	-	-	G	-
Sodium silicate	G	G-E	E	E	G	E	G	G
Sodium sulfate	G	E	G	-	-	-	E	E
Sodium sulfate (pure)	-	-	-	-	F	G	G	-
Sodium sulfide	F-G	G	G	G	F	N	E	-
Sodium sulfate	-	G	-	G	-	G	G	-
Sodium thiosulfate	-	E	E	-	-	-	-	-
Soybean oil	F	E	E	-	-	-	-	E
Stannic chloride	N	E	N	-	-	-	G	F
Stannovs chloride	N	E	N	-	-	-	G	F
Starch	-	G	-	-	-	-	-	-
Steam (202F)	E	E	E	-	-	-	-	E
Stearic acid	-	E	E	-	-	-	E	G

Fluid Handled	Carbon Steel	Stainless Steel (18-10 Mo)	Stainless Steel (18-8)	Stainless Steel (13% Cr)	Ni-Resist Type 2	Nickel Alloy	Monel - Inconel	Hastelloy
Sugar liquids	N	E	E	-	-	-	E	E
Sulfate - black liquor	-	G	G	-	-	-	E	G
Sulfate - green liquor	-	G	G	-	-	-	E	G
Sulfate - white liquor	-	G	G	-	-	-	E	F
Sulfur dioxide (dry)	G	G	G	-	-	-	E	G
Sulfur trioxide (dry)	G	G	G	-	-	-	E	G
Sulfuric acid (100%)	F	G	N	-	-	N	E	N
Sulfuric acid (20%)	N	G	N	-	-	-	E	E
Sulfuric acid (50%)	N	N	N	-	-	-	E	E
Sulfuric acid (78% or less)	N	N	-	N	N	G	E	-
Sulfuric acid (78% to 90%)	G	F	-	F	G	F	G	-
Sulfuric acid (90% to 95%)	G	E	-	G	G	F	N-F	-
Sulfuric acid fuming	G	E	-	E	N	N	N	-
Sulfuric acid	N	G	F	N	N	N	G	N
Tall oil	-	G	-	-	-	-	-	-
Tannic acid	F	G-E	E	-	F	-	G	G
Tartaric acid	N	E	N	-	-	-	E	G
Tetraethyl lead	-	G	-	-	-	-	-	-
Titamium "E"	-	-	-	-	-	-	-	-
Toluene	E	E	E	-	-	-	-	E
Toluol	E	E	-	E	E	E	E	-
Tomato juice	-	E	F	-	-	-	E	G
Trichloroethlene	G	G	G	-	-	-	E	E
Tung oil	-	G	-	-	-	-	-	-
Turpentine	G	G	G	-	-	-	-	G
Turpentine	-	E	-	E	G	E	E	-
Urea	-	G	G	-	-	-	-	-
Vamish	N	E	E	-	-	-	E	G
Vegetable oil, edible	-	E	E	-	-	-	E	G
Vegetable oil, non-edible	-	E	E	-	-	-	E	G
Vinegar	N	E	E	F	F	F	G	-
Vitamins	N	G	N	-	-	-	-	E
Water - distilled (earated)	N	E	E	-	-	-	-	E
Water - fresh	-	E	E	-	-	-	E	E
Water- sea	N	E	E	-	-	-	-	E
Xylene (dry)	G	E	E	-	-	-	-	-
Zinc chloride	N	N	N	-	-	-	G	G
Zinc chloride	N	N	-	N	F	N	N	-
Zinc hydrosulfite	E	E	E	-	-	-	G	G
Zinc sulfate	N	G	G	-	-	-	G	G

The corrosive action of many fluids varies, depending upon the concentration of the corrosive agent, temperature, presence of impurities, and various other conditions.
For that reason, the table above should be used only as a general guide.

- GSS company is not responsible for using this table.

Conversion Tables

Length
1 in =25.4mm
1 mm = .03937 in
1 ft = 30.48cm
1 meter = 3.28083 ft
1 micron = .001 mm

Area
1 sq in = 6.4516sq em
1 sq ft = 929.03 sq em
1 sq em = 0.155 sq in
1 sq em = 0.0010764 sq ft

Volume
1 cu in = 16.387 cu em
1 cu ft = 1728 cu in
1 cu ft = 7.4805 US.gal
1 cu ft = 6.229 British gal
1 cu ft = 28.317 liters
1 US. gal = 0.1337 cu ft
1 US. gal = 231 cu in
1 US. gal = 3.785 liters
1 British gal = 1.20094 US. gal
1 British gal = 277.3 cu in
1 British gal = 4.546 liters
1 liter = 61.023 cu in
1 liters = 0.03531 cu ft
1 liters = 0.2642 US. 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 = 62.4251b
1 US.galofwater=8.33lb
1 cuinofwater=0.0361lb
1 British gal of water = 10.041b
1 cu ft of air at 32° F
1 atm = 0.080728 lb

Velocity
1 ft per sec = 30.48 em per sec
1 em per sec = .032808 ft per sec

Flow
1 cu ft per sec = 448.83 gal per min
1 cu ft per sec′ = 1699.3 liters per min
1 US. gal per min = 0.002228 cu ft per sec
1 US. gal per min = 0.06308 liters per sec
1 cu em per sec = 0.0021186 cu ft per min

Density
1 lb per cu ft = 16.018 kg per cu meter
1 lb per cu ft = 0.0005787 lb per cu in
1 kg per cu meter = 0.06243 lb per cu ft
1 g per cu em = 0.03613 lb per cu in

Pressure
1 in of water = 0.03613lb per sq in
1 in of water = 0.07355 in of Hg
1 ft of water = 0.43351b per sq in
1 ft 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 = 14.6961b per sq in
1 atmosphere = 760 mm of Hg
1 atmosphere = 29.921 in of Hg
1 atmosphere (metridkg/c2) = 14.22 PSI
1 atmosphere = 33.899 of water
1 lb per sq in = 27.70 in of water
1 lb per sq in = 2.036 in ofHg
1 lb per sq in = .0703066 kg per sq em
1 kg per sq em = 14.223 lb per sq in
1 dyne per sq em = .00001451b per sq in
1 micron = .000019431b per sq in

Energy
1 BTU = 777.97 ft lbs
1 erg = 9.4805 x 1 0′″BTU
1 erg = 7.3756 xl O′s ft lbs
1 kilowatt hour = 2.655 x 106 ft lbs
1 kilowatt hour = 1.3415 hp hr
1 kg calorie = 3.968 BTU

Power
1 horsepower = 33.000 ft lb per min
1 horsepower = 550 ft lb per sec
1 horsepower = 2,546.5 BTU per hr
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 = 9/4 Re+32
Temperature Centigrade (C) = 5/9 (Fahrenheit (F) - 32) = 5/4 Re
Temperature Reaumur (Re) = 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 BTU per sq ft = .2712 g cal per sq em
1 g Calorie per sq em = 3.687 BTU per sq ft
1 BTU per hr per sq ft per Of = 4.88 kg cal per hr per sq m per °C
1 kg cal per hr per sq m per tC = .205 BTU per hr per sq ft per °f
1 Boiler Horsepower = 33479 BTU per hr

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



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