AN ISO 9001 : 2008 COMPANY

Hi-TECH *GATE VALVES*

Get the edge in process control

Hi-TECH

Butterfly Valves India Pvt. Ltd.

Hi-TECH Manufacturing Programme

DESIGN STANDARD & WALL THICKNESS: API 600 & BS 1414

Valve Type	End Conn.	ASME Class	2	2½	3	4	5	6	8	10	12	14	16	18	20	24	28	30	32	36	40
Gate Valves Bolted Bonnet Flex Wedge	Flanged	150	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		300	●	●	●	●	●	●	●	●	●	●	●								
		600	●		●	●		●	●	●	●	●	●								
		1500	●		●	●		●	●	●	●										
	Buttweld ends	150	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		300	●	●	●	●	●	●	●	●	●	●	●								
		600	●		●	●		●	●	●	●	●	●								
		1500	●		●	●		●	●	●	●										

Common Test/Inspection methods

Test / Inspection	Method	Acceptance Criteria
Visual Inspection		MSS SP55
Chemical Analysis	ASTM E350	Relevant ASTM
Mechanical Properties	ASTM A370	Relevant ASTM
Radiographic Inspection	ASME B16.34	ASME B16.34
Magnetic Particle Inspection	ASTM E709	ASME B16.34
Liquid Penetrant Inspection	ASTM E165	ASME B16.34
Ultrasonic Inspection	ASTM A388	ASME B16.34
Positive Material Identification (PMI)	Vaccum emission spectrometer	Customer specification
Pressure Testing	API 600/API 598/BS 6755 part I	API 600/API 598/BS 6755 part I
Dimensional Inspection		Valve Standard

Hi TECH valves undergo a range of destructive and non-destructive tests according to the requirement of the Standard, service conditions and specific customer requirements.

* Performed on all valves.
The pressure containing parts of all valves are marked with the foundry identification and heat numbers.

Test Pressures for standard Carbon Steel Valves

Every individual valve manufactured at Hi-TECH is inspected and pressure-tested to API 598 / BS 6755 Part I requirements, for which test certificates are provided.

ASME Class	Hydrostatic Test Pressure in kg/cm² (psig)			Pneumatic low pressure closure test pressure in kg/cm² (psig)
	Shell	Back Seat	Closure	
150	32 (450)	22 (315)	22 (315)	7 (100)
300	79 (1125)	57 (815)	57 (815)	7 (100)
600	156 (2225)	115 (1630)	115 (1630)	7 (100)
1500	392 (5575)	287 (4080)	287 (4080)	7 (100)
2500	652 (9275)	477 (6790)	477 (6790)	7 (100)

Compliance Standards

Parameter	Compliance
API 600 Gate Valve	API 600
ASME B16.34 Gate Valves	ASME B16.34
Pressure-Temperature rating	ASME B16.34
Face-to-face / End-to-end dimension	ASME B16.10
End Flange dimensions	ASME B16.5**
Butt-weld End dimensions	ASME B16.25
Valve Inspection & Testing	API 600, API 598, BS 6755 Part I

The valves also comply with applicable BS specifications.

* Shell wall thickness as per API 600/B16.34

** For valves larger than 24" (600mm), the flange drilling shall be as per ASME B16.47 Series A (MSS SP 44) or series B (API 605).

RTJ flanges are offered as optional for Class 600 and above.

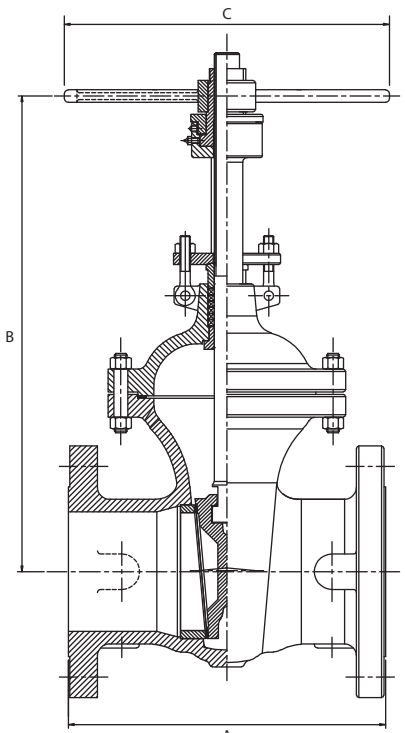
Body / Bonnet Materials

Hi-TECH Cast Steel Gate Valves are offered in a variety of body and bonnet materials to suit different requirements. These Materials include Carbon Steel (standard), Alloy Steels and Stainless Steels.

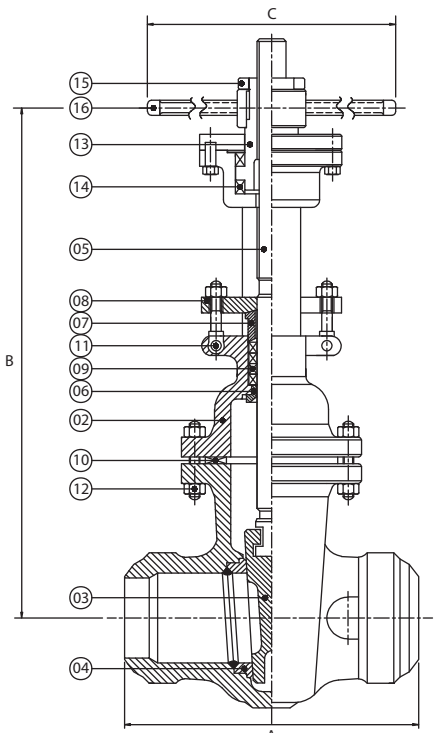
Material Classification	ASTM Specification	Working temperature*
Carbon Steel	ASTM A216 Gr. WCB	-29°C to 427°C (-20°F to 800°F)
1¼ Cr - ½ Mo	ASTM A217 Gr. WC6	-29°C to 593°C (-20°F to 1100°F)
2¼ Cr - 1 Mo	ASTM A217 Gr. WC9	-29°C to 593°C (-20°F to 1100°F)
5 Cr - ½ Mo	ASTM A217 Gr. C5	-29°C to 649°C (-20°F to 1200°F)
9 Cr - 1 Mo	ASTM A217 Gr. C12	-29°C to 649°C (-20°F to 1200°F)
9 Cr - 1 Mo - ¼ V	ASTM A217 Gr. C12A	-29°C to 649°C (-20°F to 1200°F)
Low-temperature Steel	ASTM A352 Gr. LCB/LCC	-46°C to 343°C (-50°F to 650°F)
Austenitic Stainless Steel 18-8 (Type 304)	ASTM A351 Gr. CF8	-196°C to 649°C (-320°F to 1200°F)
Austenitic Stainless Steel 16Cr - 12Ni - 2Mo (Type 316)	ASTM A351 Gr. CF8M	-196°C to 649°C (-320°F to 1200°F)

Other materials such as ASTM A351 Gr. CF3, ASTM A351 Gr. CF3M and Duplex SS are also offered.

Gate Valves - ASME Classes 150,300 & 600



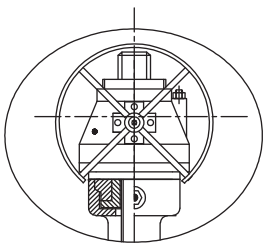
FLANGED END

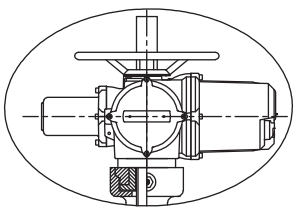


BUTT WELD END

Standard Materials of Construction

Sl. No.	Description	Material Specification
01	Body	ASTM A 216 GR. WCB
02	Bonnet	ASTM A 216 GR. WCB
03	Wedge	ASTM A 216 GR. WCB + 13% Cr.
04	Seat Ring	ASTM A 105 + ST
05	Spindle	ASTM A 182 F6
06	Back Seat Bush	ASTM A 276 GR. 410
07	Gland Bush	ASTM A 276 GR. 410
08	Gland Flange	ASTM A 216 GR. WCB
09	Gland Packing	Flexible Graphite
10	Gasket	SP Wound SS 316 + Graphite
11	Eye Bolt Stud & Nut	ASTM A 193 B7 | ASTM A 194 2H
12	Bonnet Stud & Nut	ASTM A 193 B7 | ASTM A 194 2H
13	Yoke Sleeve	S. G. Iron
14	Bearing	Steel
15	Lock Nut	AISI 1045
16	Hand Wheel	Mallaeable Iron / Ductile Iron


GEAR OPERATING ARRANGEMENT

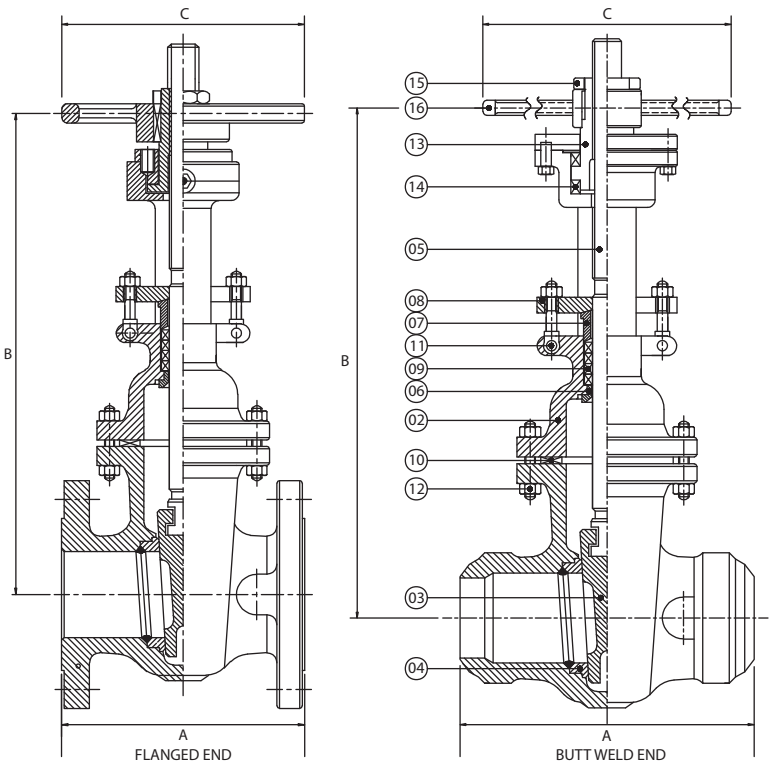

ELECTRIC ACTUATOR OPERATING ARRANGEMENT

Dimensions (in mm, unless specified)

Sr. No.	Valve Size	Class 150				Class 300				Class 600			
		A				A				A			
		Fl.	B/W	B	C	Fl.	B/W	B	C	Fl.	B/W	B	C
1	50 (2")	178	216	376	203	216	216	399	203	292	292	399	203
2	65 (2½")	191	241	480	229	241	241	505	229	-	-	-	-
3	80 (3")	203	283	480	229	283	283	505	229	356	356	541	254
4	100 (4")	229	305	584	254	305	305	604	254	432	432	635	305
5	125 (5")	254	381	750	254	381	381	850	356	-	-	-	-
6	150 (6")	267	403	790	305	403	403	850	356	559	559	874	457
7	200 (8")	292	419	996	356	419	419	1039	406	660	660	1044	457
8	250 (10")	330	457	1205	406	457	457	1265	457	787	787	1285	508
9	300 (12")	356	502	1410	457	502	502	1460	508	838	838	1476	610
10	350 (14")	381	572	1539	508	762	762	1590	508	889	889	1565	610
11	400 (16")	406	610	1752	508	838	838	1791	610	991	991	2062	762
12	450 (18")	432	660	1956	610	-	-	-	-	-	-	-	-
13	500 (20")	457	711	2159	610	-	-	-	-	-	-	-	-
14	600 (24")	508	813	2565	686	-	-	-	-	-	-	-	-
15	700 (28")	610	610	3160	762	-	-	-	-	-	-	-	-
16	750 (30")	610	610	3429	762	-	-	-	-	-	-	-	-
17	800 (32")	711	711	3650	762	-	-	-	-	-	-	-	-
18	900 (36")	711	711	3734	762	-	-	-	-	-	-	-	-
19	1000 (40")	813	1118	4000	-	-	-	-	-	-	-	-	-

Fl. - Flanged ; B/W - Butt-weld. *Depends on flange dimensions. Intermediate sizes 22", 26", 32", 38", 40", 46", in Class 150 are also offered.
Class 600 gate valves can also be given in pressure seal bonnet design, in sizes from 80mm (3") up to 300mm (12").

Gate Valves - ASME Class 1500



Standard Materials of Construction

Sl. No.	Description	Material Specification
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02	Bonnet	ASTM A 216 GR. WCB
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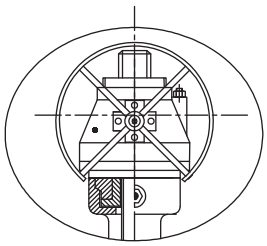
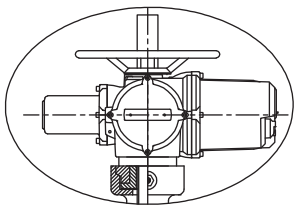


GEAR OPERATING ARRANGEMENT



ELECTRIC ACTUATOR OPERATING ARRANGEMENT

Dimensions (in mm, unless specified)

Valve Size	Class 1500			
	A		B	C
	Fl.	B/W		
50 (2")	368	368	570	229
80 (3")	470	470	720	305
100 (4")	546	546	850	356
150 (6")	705	705	1200	508
200 (8")	832	832	1600	508
250 (10")	991	991	1950	762
300 (12")	1130	1130	2150	762

Fl. - Flanged ; B/W - Butt-weld.

Features & Benefits

Body & Bonnet

The design of the body and bonnet is calculated to achieve the most regular distribution of stress in all directions, as well as the minimum turbulence and resistance to flow.

Valve bonnets are equipped with a backseat bushing. The yoke is integrally cast on Pressure Classes 150 and 300 up to 12" and up to 10" on Class 600 and higher ratings.

Body-Bonnet Joint

Standard body-bonnet joints of gate valves are machined as follows:

Joint Design

Flat Faced Male-and-Female Ring Type Joint

*Pressure Class 600 also available in Ring Type Joint. Hi-TECH can supply any style of gasket required by customer.

Gate

All gates are fully guided to the seats. As standard our valves are supplied with a flexible gate that has a tapered H cross-section. The flexible wedge is cast or machined with a circumferential groove to allow the seating surfaces to move independently and adjust to movement of the body seats. This design is beneficial where line loads or thermal expansion of the system is likely to distort the seat face in the valve. This design of gate is ideally suited for steam or other high temperature services and is especially useful to prevent sticking where valves are closed when hot and opened when cold.

Seat Ring

Seat rings are designed to greatly reduce and/or prevent any turbulence and avoid damages due to the corrosion. The seat rings are forged or rolled in one piece, and then seal welded and overlaid, if required. After welding and all required heat treating, the seat ring faces are machined, thoroughly cleaned and inspected before leaving for assembly.

Stem

The stem connection to the gate is a T-head design which is integral (without welding) with the stem. The accuracy in the dimensions and finishes assure a long life with a perfect tightness in the packing area, resulting in lower fugitive emissions.

The stem-to-gate connection is designed to prevent the turning or the disengagement of stem from the wedge while the valve is in service.

Through calculations and extreme testing, the strength of the stem-to-gate connection has proven to exceed the strength of the stem at the root of its operating thread.

Stem Packing

The stem packing is designed and arranged to ensure a maximum seal along the stem during operation or while at position, thus allowing for a greater reduction in fugitive emissions. Our packings are NON-ASBESTOS types.

Hi-TECH can supply any style of packing required by our customer.

Stuffing Box

The depth of the stuffing box allows for a sufficient amount of packing, which makes the stem seal. Our standard packing arrangement and stuffing box design meets <100 ppm fugitive emission requirements.

If specified in the purchase order, lantern rings and/or grease injectors can be furnished.

Packing Gland

The packing gland design is a two-piece self-aligning type. The packing gland has a spherical head that rides within the spherical joint of the gland flange. The packing gland has a shoulder, which restricts the complete entry into the stuffing box bore. This particular design assures a straight compression of the packing as the gland eyebolts are being equally adjusted, without injuring the stem.

Stem Nut

The stem nut arrangement and design allows for the removal of the handwheel without allowing the stem and gate to drop into the closed position if the handwheel is removed while the valve is in the open position.

Ball bearings are provided in the stem nut arrangement of Class 150 valves from NPS 14", on Class 300 valves from NPS 12:, on Class 600 valves from NPS 6", and on Classes 900-1500 valves from NPS 2".

Hi-Tech Make Gate Valves Confirming to API 600 / API 6D

Handwheels

Handwheels are designed for easy operation and a comfortable grip. Our valves are also available with gearing, motor actuators or cylinder actuators for the more demanding services.

Bolts and Nuts

For normal service conditions, ASTM A194 Class 2H and ASTM A193 Grade B7 nuts and stud bolts are furnished. If specified for high temperature service conditions, ASTM A194 Class 4 and ASTM A193 Grade B16 nuts and stud bolts are furnished. Standard bolting furnished for our stainless steel valves consists of ASTM A194 Class 8 and ASTM A193 Grade B8 nuts and stud bolts.

Hi-TECH can supply any bolting as required by the customer.

End Connections

Our standard production covers valves with:

Flange ends with Raised Face (RF), Flat Face (FF) or Ring Type Joint (RTJ) that conform to B16.5.

Butt-welding ends (BW) that conform to B16.25.

All face-to-face/end-to-end dimensions conform to B16.10.

Other special end connections are supplied according to customer's requirements

Hi-TECH BUTTERFLY VALVES INDIA PVT. LTD.

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