

CAST STEEL VALVE

SERVICE FEATURES

- Several trim combinations available for various services.
- Straight-through port design offering a good flow with minimum frictional loss and turbulence.
- Cast steel Valve suitable for works demanding strength, shock resistance, elongation and heat resistance.
- Bottom seating of seat rings ground accurately for maximum strength and tightness(globe).
- Bypass mounting to equalize pressures.
- Normal yoke bushing furnished with ductility resistant to high melting point of above 2200°F.
- Level and weight available to accelerate/decelerate disc closing (swing check).
- Designed for maximum flow with minimum pressure drop if possible.
- Precision-ground seating surfaces and revolving disc providing a long life.

In the refineries, power plants, utilities and petrochemical/chemical process industries, PK cast steel valve have been regarded as of great importance about their excellent performance and reliability.

By discriminatory blending of carefully selected materials combined with sound design and precision machining/assembly under strict quality controls, PK steel valve have gained general and wide acceptance. The products are manufactured in accordance with ASTM, ANSI, or other international standards.

CAST STEEL VALVE PRODUCTION RANGE

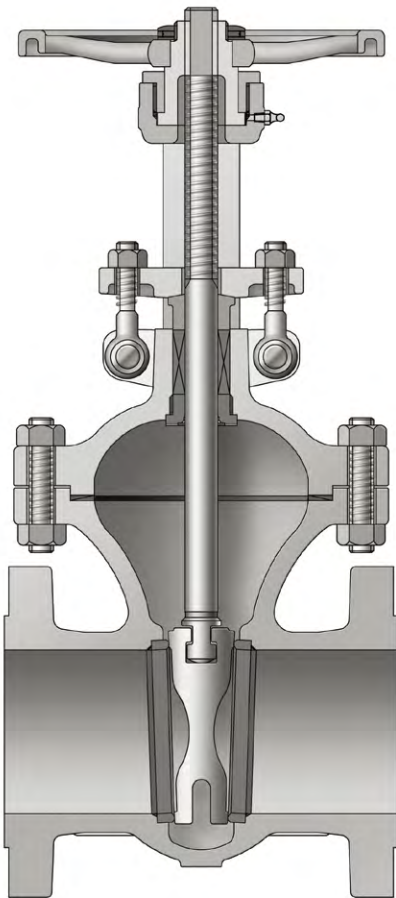
UNIT : NPS

Type \ Class	150	300	600	900	1500	2500
GATE	2-∞	2-80	2-48	2-48	2-30	2-30
GLOBE	2-64	2-64	2-36	2-36	2-24	2-24
SWING CHECK	2-64	2-64	2-48	2-36	2-30	2-30
TILTING CHECK	2-64	2-64	2-48	2-36	2-30	2-30
Y-GLOBE	2-60	2-48	2-36	2-36	2-24	2-24
ANGLE GLOBE	2-24	2-24	2-24	2-24	2-24	2-24

PRODUCTION MATERIALS

- Carbon Steel : ASTM A216-WCB or Equivalent
- Alloy Steel : ASTM A217-WC6, WC9, C5, C12, C12A or Equivalent
- Stainless Steel : ASTM A351-CF8, CF8M, CF3, CF3M, CN7M, or Equivalent
- Duplex Stainless Steel : ASTM A995-1A, 2A, 4A, 5A or Equivalent
- Special Alloy Steel : Inconel 625, Incoloy 825, Hastelloy C, Monel, AL-BRONZE
- ASME SA designation material(e.g ASME SA217-WC6)

GATE VALVE



FUNCTION

Gate valve is characterized by a sliding wedge which is moved by actuator perpendicular to the flow direction. There are a variety of valve sizes and types. The valve is used primarily as a stop valve to open or close fully. Normally it works for slurries, viscous fluid, etc., but not for throttling. The gate valve usually has a minimum pressure drop in full open and a tight seal in full close, and therefore there is little possibility that contaminants may enter the valve.

BODY AND BONNET

The body and bonnet is designed to achieve most uniform distribution of stress on all sides and minimum turbulence and resistance to flow. The bonnet on valve is equipped with back seat ring up to 12" for Class 150 & 300 and up to 10" for Class 600 or higher. The yoke is integrated with bonnet.

BODY-BONNET JOINT

Body-bonnet joint of gate valve is machined as follows:

Class 150 Plain faced

Class 300 and higher class Male and female

We can supply any kinds of gasket as required by customer.

WEDGE

The valve is normally supplied with a one-piece flexible wedge of which the cross section is a tapered H shape.

All wedges are fully guided. The flexible wedge is cast or machined with circumferential grooves to allow the seating faces to move independently and adjust the movement of body seat.

It is used where the line load or thermal expansion of system may distort the seating face of valve, and especially useful to prevent sticking that may happen in case the valve is closed at a hot temperature and opened at a cold temperature.

Ideally the wedge is suitable for steam and other high temperature service.

SEAT RING

The seat ring as a welded-in type is designed to prevent any turbulence and damage by corrosion. It is forged or rolled type into one piece for all dimensions, heat treated to obtain the desired surface hardness, and cleaned thoroughly before assembling.

STEM

The stem connection to the wedge shall have an integrated tee head (without welding) and is rectified in the packing area to ensure a long life and perfect tightness. Through experiments, we have calculated and checked the connections between stem and wedge not to disengage the stem from wedge while gate valve is working.

The strength of stem and wedge connections is stronger than that of stem alone at the root of thread.

PACKING

The packing size is designed to secure maximum tightness along the stem, and the standard packing is a non-asbestos type. We can supply any kinds of packing as required by customer.

YOKE SLEEVE

The yoke sleeve is designed to be able to be disassembled without discounting bonnet and stem, and provided with ball bearing of 14" or over for Class 150 ~ 300 valve, 6" or over for Class 600, and 2" or over for Class 900 ~ 1500.

GLAND

The gland is made of two pieces. Packing gland is in contact with the packing which is connected to gland flange through a spherical joint. Particular design permits a correct pressure on the packing without any damage to stem due to friction or corrosion.

STUFFING BOX

The stuffing box gives maximum packing stem seal.

Lantern ring and grease injector shall be furnished only if specified on the purchase order.

HAND WHEELS

Hand wheels are designed for easy operation. With gearing, motor actuator or cylinder actuator, it is also available for more difficult services.

BOLTS AND NUTS

Bolts and nuts are made from four different types of steel materials in conformity with the ASTM specification:

1) A307 Grade B : It has a minimum tensile strength of 55,000 pounds per square inch (3870kg/mm²).

The nuts normally used with machine bolts are a hot pressed steel conforming to ASTM specification A307, which is usually applied to hinge bolts and nuts.

2) A193 Grade B7/B16 : It usually retains the strength well at an elevated temperature and offers higher resistance to creep than any other high grade steel used as bolting materials. This steel is regularly used in bonnet bolts.

3) A194 Grade 2H/4 : The nuts of this grade shall be re-heated above the critical range of steel, quenched in a suitable medium, and then tempered at a temperature not less than 850°F(455°C). This steel is regularly used in bonnet nuts.

4) Carbon steel : It is used in hand wheel nuts, set screws, or nipples.

END CONNECTIONS

In our standard production of valve, the flange ends(RF.FF) and the face to face dimensions conform to ANSI B16.5 and ASME B16.10, respectively, and they have a raised face serrated finish type or other finish type as requested.

For butt-welded ends (B.W.), of which the end to end dimension conforms to ASME B16.10, customer must specify the schedule type required, pipe class, or bore diameter.

Ring type joint flanged ends (R.T.J) conform to ASME B16.5 and the end to end dimension follows ASME B16.10. The other special end connections may be supplied as required by customer.

GEAR OPERATED VALVE

Valve can be supplied with gear operators.

MOTOR OPERATED VALVE

Valve can be supplied with actuators, either electric or pneumatic, according to customer's requirements.

ACCESSORIES

We can supply a valve fitted with accessories such as bypass, locking device, chain wheel, extension stem, etc. For more details, refer to the Accessories column.

PACKING AND GASKET MATERIALS

Packing material supplied in standard valve is non-asbestos graphite, with braided graphite rings and die-formed rings configured to provide reliable and long-lasting performance. Braided rings are coated with zinc dust to inhibit corrosion.

Dieformed rings are 98% carbon(minimum)and have maximum 50PPM chloride 550PPM sulfur content.

For standard valve, gasket materials are as follows;

Class 150 - graphite sheet type with 304 stainless steel tanged insert. (1.6mm minimum overall thickness)

Class 300 - spiral wound 304 stainless steel and graphite.

Class 600 - same as class 300 or 900

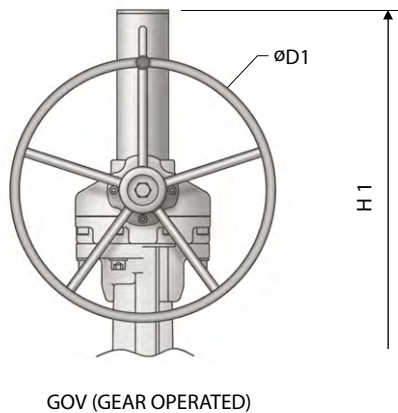
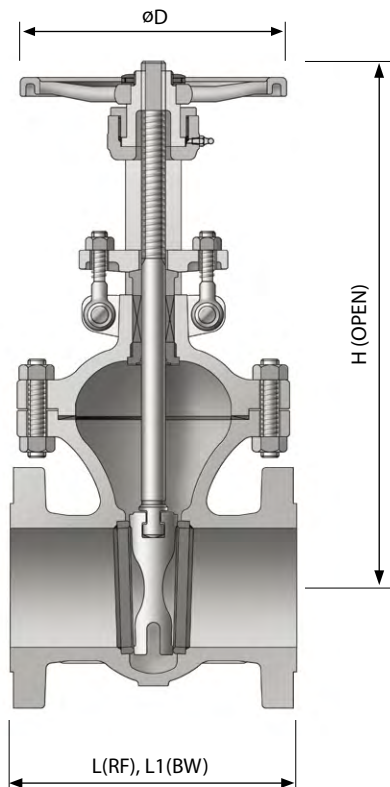
Class 900 and 1500 - Ring type joint

SEAL AREA DESIGN

Cast steel valve are designed and manufactured to satisfy strict requirements in order to prevent external leakage and to meet fugitive emission requirements of most customers.

Stuffing box finishes of 63 to 125 RMS, stem finishes of 16 to 32 RMS, control of straightness and concentricity of stems, and controlled diametrical clearances between stem and gland, stem and backseat, and gland and stuffing box, all combine to guarantee consistent performance of stem seals.

Gasket surfaces between bodies and bonnets are strictly controlled to finishes of 32 to 63 AARH. When combined with engineered bolting design, quality materials and strict assembly procedures, these finishes guarantee consistent sealing in gasket areas.



END CONNECTION

- R.F FLANGED ENDS TO ASME B16.5
- B.W. ENDS TO ASME B16.25
- R.T.J FLANGED ENDS TO ASME B16.5
- SIZE 26" AND LARGER, FLANGED ENDS ACCORDING TO ASME B16.47 SER.A OR SER.B

STANDARD MATERIAL SPECIFICATIONS

NO	PART NAME	MATERIAL		
1	BODY	A216 - WCB	A217 - WC6	A351 - CF8
2	BONNET	A216 - WCB	A217 - WC6	A351 - CF8
3	WEDGE	A217 - CA15 + STL	A217 - CA15 + STL	A351 - CF8 + STL
4	STEM	A479 - 410	A479 - 410	A479 - 304
5	HAND WHEEL	A197	A197	A197
6	BODY SEAT RING	A576 - 1020 + STL	A182 - F11 + STL	A240 - 304 + STL
7	BACK SEAT RING	A479 - 410	A479 - 410	A479 - 304
8	GASKET	SPIRAL WOUND / GRAPHITE+304+304		
9	PACKING	GRAPHITE+GRAPHITE WITH INCONEL WIRE		
10	GLAND FLANGE	A105	A105	A351 - CF8
11	HINGE BOLT	A307 - B	A307 - B	A193 - B8
12	HINGE NUT	A194 - 2H	A194 - 2H	A194 - 8
13	HINGE PIN	A576 - 1020	A576 - 1020	A479 - 304
14	PACKING GLAND	A576 - 1020 + Cr	A479 - 410	A479 - 304
15	BONNET BOLT	A193 - B7	A193 - B16	A193 - B8
16	BONNET NUT	A194 - 2H	A194 - 4	A194 - 8
17	YOKE CAP	A576 - 1020	A576 - 1020	A576 - 1020 + Zn
18	YOKE SLEEVE	A439 - D2C	A439 - D2C	A439 - D2C
19	HANDLE NUT	A47 - 32510 + Zn	A47 - 32510 + Zn	A47 - 32510 + Zn
20	SET SCREW	STEEL	STEEL	STEEL + Cr
21	NIPPLE	STEEL + Cr	STEEL + Cr	STEEL + Cr
22	GEAR BOX	DUCTILE IRON	DUCTILE IRON	DUCTILE IRON
23	STEM COVER	A53	A53	A53

DIMENSION AND WEIGHT

CLASS 150

UNIT: mm

SIZE	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30
L	177.8	203.2	228.6	266.7	292.1	330.2	355.6	381.0	406.4	431.8	457.2	508.0	558.8	609.6	609.6
L1	215.9	282.4	304.8	403.4	419.1	457.2	501.7	571.5	609.6	660.4	711.2	812.8	-	-	-
D	200	224	250	315	355	400	450	500	560	630	710	800	-	900	900
D1	-	-	-	250	250	355	355	355	500	500	630	630	710	710	710
H	339	441	535	735	927	1125	1317	1550	1823	1900	2120	2502	-	2873	3066
H1	-	-	-	950	1071	1260	1462	1658	1830	2058	2268	2660	2950	3052	3268
WEIGHT(Kg)	16	29	43	72	116	173	263	388	535	648	822	1276	1552	1777	2119

CLASS 300

UNIT: mm

SIZE	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30
L	215.9	282.4	304.8	403.4	419.1	457.2	501.7	762.0	838.2	914.4	990.6	1143.0	1244.6	1346.2	1397
L1	215.9	282.4	304.8	403.4	419.1	457.2	501.7	762.0	838.2	914.4	990.6	1143.0	-	-	-
D	200	224	250	355	400	450	500	560	630	710	800	900	-	-	-
D1	-	-	-	250	355	355	355	500	500	630	630	710	800	800	900
H	340	442	536	745	951	1142	1325	1631	1692	1909	2119	2492	-	-	-
H1	-	-	-	895	1087	1269	1470	1669	1849	2065	2272	2667	3057	3265	3475
WEIGHT(Kg)	22	41	59	119	193	291	410	687	876	1201	1500	2258	3026	3450	4147

CLASS 600

UNIT: mm

SIZE	2	3	4	6	8	10	12	14	16	18	20	24	26	28	30
L	292.1	355.6	431.8	558.8	660.4	787.4	838.2	889.0	990.6	1092.2	1193.8	1397.0	1447.8	1549.4	1651
L1	292.1	355.6	431.8	558.8	660.4	787.4	838.2	889.0	990.6	1092.2	1193.8	1397.0	-	-	-
D	200	250	355	450	500	630	-	-	-	-	-	-	-	-	-
D1	-	-	-	355	500	500	630	630	710	710	800	900	900	900	900
H	394	475	591	801	1005	1192	-	-	-	-	-	-	-	-	-
H1	-	-	-	995	1233	1360	1605	1792	2079	2160	2366	2740	3002	3235	3480
WEIGHT(Kg)	35	64	110	222	405	626	878	1165	1490	1836	2410	3639	4437	5589	6933

CLASS 900

UNIT: mm

SIZE	2	3	4	6	8	10	12	14	16	18	20	24
L	368.3	381.0	457.2	609.6	736.6	838.2	965.2	1028.7	1130.3	1219.2	1320.8	1549.4
L1	368.3	381.0	457.2	609.6	736.6	838.2	965.2	1028.7	1130.3	1219.2	1320.8	1549.4
D	250	355	355	500	630	710	-	-	-	-	-	-
D1	-	250	250	500	500	630	710	710	710	900	900	900
H	474	623	718	958	1290	1451	-	-	-	-	-	-
H1	-	678	900	1112	1322	1542	1786	1792	1955	2308	2466	2889
WEIGHT(Kg)	73	103	159	318	568	908	1234	1628	2288	3025	3850	5200

CLASS 1500

UNIT: mm

SIZE	2	3	4	6	8	10	12	16
L	368.3	469.9	546.1	704.9	831.9	990.6	1130.3	1384.4
L1	368.3	469.9	546.1	704.9	831.9	990.6	1130.3	-
D	250	355	400	560	800	900	-	1092
D1	-	-	355	500	630	710	800	800
H	474	603	730	944	1205	1414	-	2129
H1	-	-	880	1106	1350	1570	1826	2341
WEIGHT(Kg)	81	141	227	515	992	1603	2572	5255