



Shipbuilding – Hull cast steel gate valves

1. Scope This Japanese Industrial Standard specifies cast steel gate valves (hereinafter referred to as “gate valve”) intended for the services on sea water and bilge pipelines, and to be directly fitted on ship’s bottom or side.

Remark: This standard makes reference to the following standards:

- JIS B 0205 – Metric coarse screw threads
- JIS B 0222 – 29°C trapezoidal screw threads
- JIS B 1532 – Rolling bearing – Thrust ball bearings with flat back faces
- JIS B 1575 – Grease nipples
- JIS B 1701 – Involute gear tooth profile and dimensions
- JIS B 2210 – Basic dimensions of ferrous materials pipe flanges
- JIS F 7102 – Shipbuilding – Piping system in machinery space – Application for gaskets and packings
- JIS F 7400 – Shipbuilding – Valves and cocks – General inspection requirement
- JIS G 3101 – Rolled steel for general structure
- JIS G 3452 – Carbon steel pipes for ordinary piping
- JIS G 3505 – Low carbon steel wire rods
- JIS G 3506 – High carbon steel wire rods
- JIS G 4051 – Carbon steel for machine structural use
- JIS G 4303 – Stainless steel bars
- JIS G 5101 – Carbon steel castings
- JIS G 5121 – Stainless steel castings
- JIS G 5501 – Gray iron castings
- JIS H 3100 – Copper and copper alloy sheets, plates and strip
- JIS H 3250 – Copper and copper alloy rods and bars
- JIS H 3260 – Copper and copper alloy wires
- JIS H 5111 – Bronze castings

2. Pressure rating The relation between fluid condition and maximum working pressure shall be as given in Table 1.

Table 1

Fluid condition	Maximum working pressure MPa			
	Nominal dia. 400 or less		Nominal dia. 450 or more	
	Class B	Class S	Class B	Class S
Sea water and bilge	1.0		0.2	

3. Construction, shape and dimensions The construction, shape and dimensions shall be as shown in Figs. 1, 3 and 5. And the body, bonnet and disc shall be properly ribbed where necessary. The permissible deviations of body thickness “a” shall, as a rule, be within $\pm 15\%$, but when the calculated value is below 1 mm, the permissible deviation may be 1 mm.

4. Materials The materials shall be as follows:

- (1) The body, bonnet and principal parts (disc, valve seat and stem) and screwed piece shall be as shown in Figs. 2, 4 and 6. The valves shall be classified into Class B and Class S depending on combination of materials. However, for the valve seat in Class S, the body and disc may be deposited with an austenitic stainless steel bead. The valve seat (with disc) of nominal diameter 200 or less may be of the construction integral with disc. The materials in this case shall be the

same as those of the valve seat.

- (2) The materials used for other parts shall, as a rule, be as shown in **Figs. 2, 4 and 6**.

5. Tests and inspection The gate valves shall be subjected to the following items of inspection in accordance with **JIS F 7400**.

- (1) Material inspection
- (2) Visual inspection
- (3) Dimensional inspection
- (4) Assembly inspection
- (5) Hydraulic inspection. The inspection shall be performed under the test pressure as given in **Table 2**.

Table 2

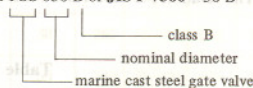
Nominal diameter	Test pressure MPa	
	Watertight inspection for valve seat	Hydraulic inspection for body
400 or less	1.1	1.5
450 or more	0.25	0.5

Remarks: For the valves of nominal diameter 450 or more where the test pressure for watertight inspection for valve seat given in **Table 2** is difficult to comply with, it shall be determined in consultation with the purchaser.

- 6. Designation** The gate valves shall be designated by the title, nominal diameter and material classification mark or symbol. **JIS** number may be used in place of the title.

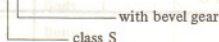
Example: 1. For a gate valve of Class B and nominal diameter 50:

Marine cast steel 50 gate valve B or FSS 050 B or **JIS F 7360 – 50 B**



2. For a gate valve of Class S and nominal diameter 550 :

Marine cast steel 550 gate valve S (with bevel gear)
or FSS 550 SK or **JIS F 7360 – 550 SK**



- 7. Marking** The following particulars shall be marked on the body.

- (1) Maximum working pressure and nominal diameter

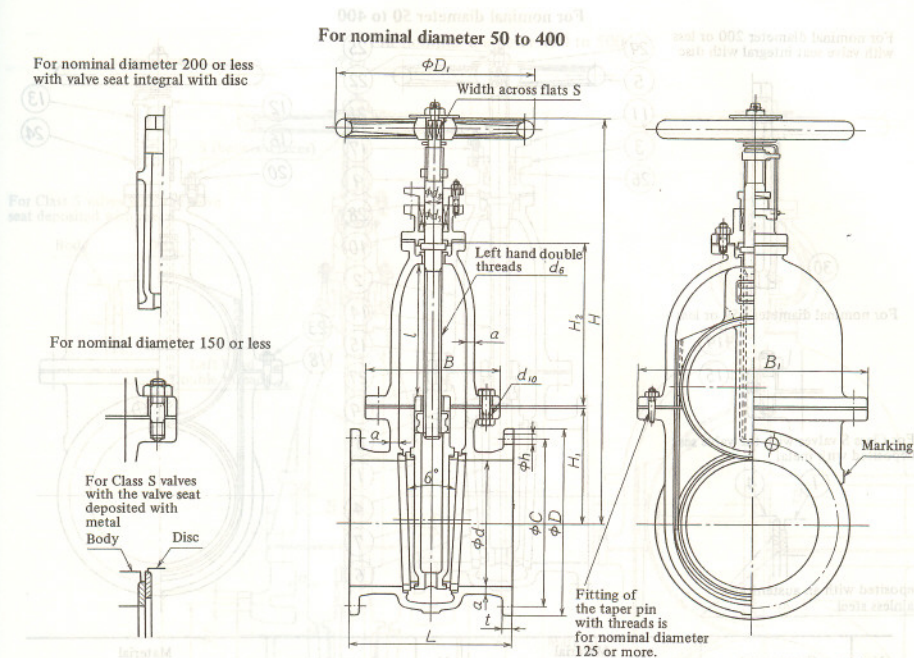
Example: 10 K – 50

- (2) Manufacturer's name or mark

- (3) Year and month of manufacture

Related Standard:

ISO 5208 – Industrial valves – Pressure testing of valves



Unit: mm

Nominal dia.	<i>d</i>	<i>L</i>	<i>D</i>	Flange						Approx. <i>H</i>	Lift <i>l</i>	Handwheel <i>D</i> ₁	Body and bonnet								Stem				Stuffing box <i>d</i> ₇	Reference Calculated mass (kg)
				Bolt hole				Nominal dia. of bolt <i>t</i>					Bolt								Threads <i>d</i> ₆		<i>d</i> ₈	<i>S</i>		
				P.C. dia. <i>C</i>	No.	<i>h</i>	No.						Threads <i>d</i> ₁₀	Threads <i>d</i> ₉	<i>d</i> ₅	<i>d</i> ₄										
50	50	200	155	120	4	19	M 16	16	300	58	140	8	80	96	150	160	88	M 12	TW 18	18	12	28	17.1			
65	65	220	175	140	4	19	M 16	18	350	74	160	9	90	120	167	192	8	M 16	TW 20	20	14	32	26.5			
80	80	230	185	150	8	19	M 16	18	400	89	180	9	115	127	175	212	8	M 16	TW 22	22	14	36	31.5			
100	100	250	210	175	8	19	M 16	18	450	110	200	11	135	146	195	245	8	M 16	TW 24	24	17	38	44.9			
125	125	270	250	210	8	23	M 20	20	520	136	224	12	155	176	215	285	8	M 20	TW 26	26	19	42	63.2			
150	150	290	280	240	8	23	M 20	22	580	160	250	13	170	204	220	312	8	M 20	TW 28	28	22	44	82.3			
200	200	310	330	290	12	23	M 20	22	700	212	315	15	210	258	240	375	12	M 20	TW 32	32	22	50	130			
250	250	340	400	355	12	25	M 22	24	840	264	400	17	245	329	275	443	12	M 22	TW 38	38	30	60	203			
300	300	380	445	400	16	25	M 22	24	960	315	450	19	275	392	315	525	16	M 22	TW 42	42	30	66	291			
350	335	420	490	445	16	25	M 22	26	1050	352	500	20	300	433	345	585	14	M 24	TW 44	44	32	68	368			
400	380	480	560	510	16	27	M 24	28	1150	396	560	22	335	479	390	665	16	M 24	TW 48	48	36	74	507			

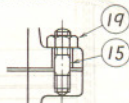
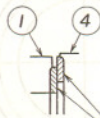
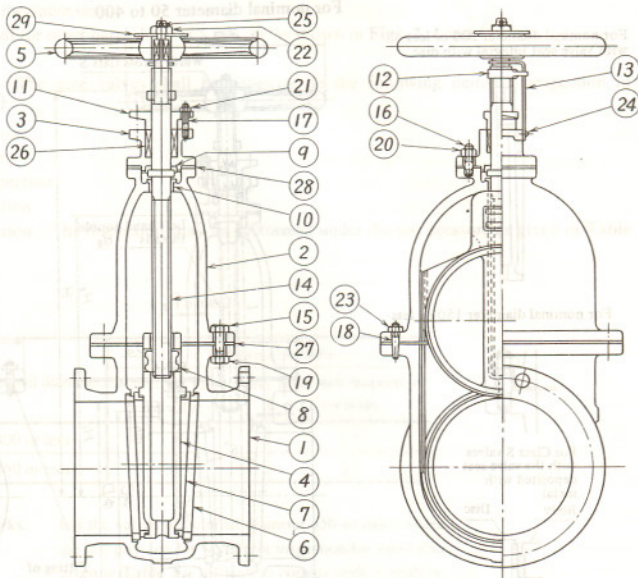
- Remarks:
1. The flanges shall conform to nominal pressure 10 K of JIS B 2210.
 2. The thread d_6 shall conform to JIS B 0222, and d_{10} to JIS B 0205.
 3. The valve opening indicating plate shall, as a rule, be fitted on the same side as valve marking on the body.
 4. The stem may be partially modified to suit connecting with the transmission shaft.
 5. The name plate shall be specified by the purchaser as required.
 6. The calculated mass is shown for Class S.
 7. The body may be provided with drain plug according to the purchaser's designation.

Fig. 1

For nominal diameter 50 to 400

For nominal diameter 200 or less
with valve seat integral with disc

For nominal diameter 150 or less

For Class S valves with the valve seat
deposited with metalDeposited with an austenitic
stainless steel

No.	Component	Material		No.	Component	Material	
		Class B	Class S			Class B	Class S
1	Body	JIS G 5101 - SC 480		16	Stud	JIS G 3101 - SS 400	
2	Bonnet	JIS G 5101 - SC 480		17	Stud	JIS H 3250 - C 3771 BD	
3	Yoke	JIS G 5101 - SC 480		18	Taper pin with threads	JIS G 4303 - SUS 403	
4	Disc	JIS G 5101 - SC 480		19	Hexagon nut	JIS G 3101 - SS 400	
5	Handwheel	JIS G 5501 - FC 200		20	Hexagon nut	JIS H 3250 - C 3604 BD	
6	Valve seat of body	JIS H 5111 - BC 6	JIS G 4303 - SUS 420 J1 or SUS 420 J2	21	Hexagon nut	JIS H 3260 - C 2700 W	
7	Valve seat of disc	JIS H 5111 - BC 6	JIS G 4303 - SUS 420 J1 or SUS 420 J2	22	Hexagon nut	JIS H 3260 - C 2600 W	
8	Screwed piece	JIS H 5111 - BC 6		23	Hexagon nut	JIS F 7102	
9	Guide bush	JIS H 5111 - BC 6		24	Cross-recessed pan head machine screw	JIS H 3100 - C 2801 P	
10	Guide bush	JIS H 5111 - BC 6		25	Split pin	JIS H 5111 - BC 6	
11	Packing gland	JIS H 5111 - BC 6		26	Packing	JIS G 5121 - SCS 2	
12	Opening indicator	JIS H 3100 - C 2801 P		27	Gasket	JIS H 3100 - C 2801 P	
13	Opening indicating plate	JIS H 3100 - C 2801 P		28	Gasket	JIS H 3100 - C 2801 P	
14	Stem	JIS H 3250 - C 3771 BD or C 3771 BE	JIS G 4303 - SUS 403	29	Nameplate	JIS H 3100 - C 2801 P	
15	Stud	JIS G 3101 - SS 400		30	Disc	JIS H 5111 - BC 6	JIS G 5121 - SCS 2
	Hexagon bolt	JIS G 3101 - SS 400					

- Remarks:
1. The materials for the components in boldface comply with the requirements specified in 4. (1).
 2. The contact surfaces of stainless steel shall have a suitable difference in hardness by heat treatment or else for the purpose of preventing seizure (excluding the part deposited with austenitic stainless steel bead).
 3. The components with Part No. 18 and No. 23 shall be provided for valves with nominal diameter 125 or more.
 4. The surfaces of cast steel in contact with liquid may be subjected to lining, coating, etc. by the purchaser's designation for the purpose of preventing corrosion.

Fig. 2