



Shipbuilding – Cast iron 5 K gate valves

1. Scope This Japanese Industrial Standard specifies marine cast iron 5 K gate valves (hereinafter referred to as “gate valve”) used for steam, fuel oil, lubricating oil, fresh water, feed water, etc. lines in ships.

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 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 4303 – Stainless steel bars
- 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. Relation between fluid condition and maximum working pressure The relation between fluid condition and maximum working pressure for the gate valve shall be as given in **Table 1**.

Table 1

Fluid condition	Maximum working pressure MPa		
	Nominal dia. 200 or less	Nominal dia. 250 to 400	Nominal dia. 450 to 600
Saturated steam	0.3	0.2	
Oil and pulsation water	0.5		
Non-shock water of 120°C or less	0.7		0.5

3. Construction, shape and dimensions The construction, shape and dimensions of the gate valve shall be as shown in **Figs. 1 and 3**. And the body, bonnet and disc shall be properly ribbed where necessary. The permissible deviation of body thickness “a” and bonnet “a₁” shall, as a rule, be within $\begin{matrix} +15 \\ -10 \end{matrix}$ %, but when the calculated value is below 1 mm, the permissible deviation may be 1 mm.

For the nominal diameter 450 to 600 and working pressure of 0.2 MPa or less, the thrust ball bearing may be replaced by the directly turning type with handwheel, when specified by purchaser.

4. Materials The materials for the gate valve shall be as follows:

- (1) The materials for body, bonnet, disc, valve seat, stem and screwed piece shall be as shown in **Figs. 2 and 4**.
The gate valves shall be classified into Class B and Class S according to the combination of materials.
- (2) The materials for other parts shall, as a rule, be as shown in **Figs. 2 and 4**.

5. **Tests and inspection** The gate valves shall be subjected to inspection on items (1) to (5) of inspection in accordance with JIS F 7400.

- (1) Material inspection
- (2) Visual inspection
- (3) Dimensional inspection
- (4) Assembly inspection
- (5) Hydraulic inspection

The gate valves shall be tested as given in Table 2. However, watertight inspection for valve seats of valves with nominal diameter 300 or more may be performed at lower pressures specified by purchasers, than the test pressure specified in Table 2.

Table 2

Nominal dia.	Test pressure MPa	
	Watertight inspection for valve seat	Hydraulic inspection for body
400 or less	0.77	1.05
450 to 600	0.55	0.75

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

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

Marine cast iron 5 K - 50 gate valve B or

FS 5 050 B or JIS F 7363-50 B

FS 5 050 B or JIS F 7363-50 B
 — Class B
 — nominal diameter
 — nominal pressure
 — marine cast iron gate valve

2. For a gate valve of Class S and nominal diameter 450 (with thrust ball bearing):

Marine cast iron 5 K - 450 gate valve S (with thrust ball bearing) or

FS 5 450 ST or JIS F 7363-450 ST

FS 5 450 ST or JIS F 7363-450 ST
 — with thrust ball bearing
 — Class S
 — nominal diameter

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

- (1) Nominal pressure and nominal diameter

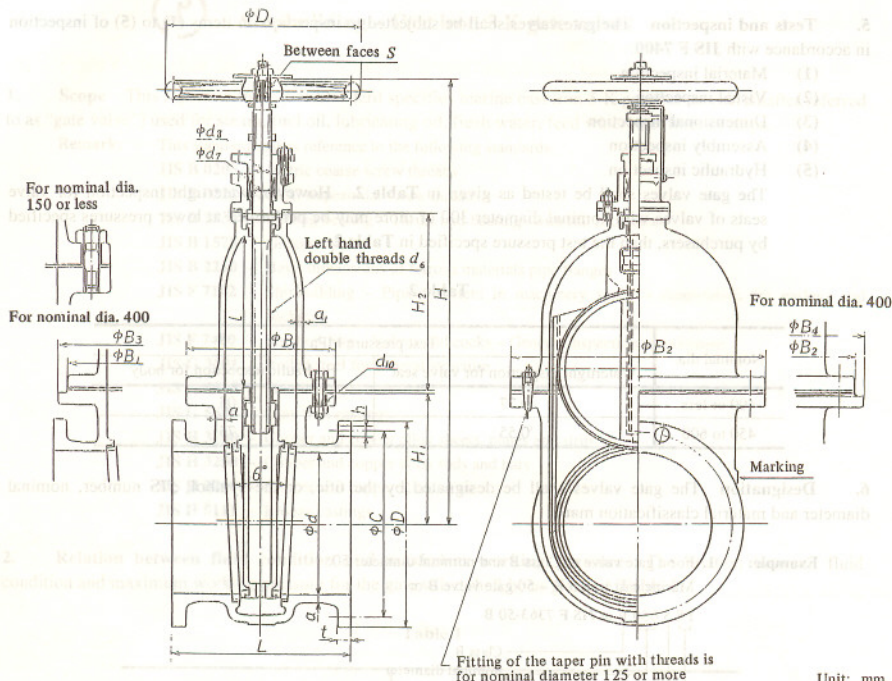
Example: 5 K - 50

- (2) Test pressure of watertight inspection for valve seat (only when test pressure for valve seat with nominal diameter 300 or more is specified by purchasers, the valve shall be marked.)
- (3) Manufacturer's name or mark
- (4) Year of manufacture or the abbreviated

Related Standards:

JIS B 0207 - Metric fine screw threads

ISO 5208 - Industrial valves - Pressure testing for valves



Unit: mm

Nominal dia	Flange								Lift			Handwheel			Body and Bonnet										Stem				Stuffing box	Reference Calculation and mass (kg)				
	d	L	D	Bolt hole		Nominal dia of bolt	t	H							t	D ₁	a	a ₁	H ₁	H ₂	B ₁	B ₂	B ₃	B ₄	Bolt		Threads				d ₆	d ₈	S	d ₇
				P.C. dia. C	No.																				h	No.	Threads d ₁₉	d ₆						
50	50	180	130	105	4	15	M12	16	285	58	125	8	7	75	94	140	153	—	—	6	M12	TW16	16	10	26	13.5								
65	65	190	155	130	4	15	M12	18	330	74	140	9	8	85	118	145	172	—	—	6	M12	TW18	18	12	28	19.0								
80	80	200	180	145	4	19	M16	18	380	89	160	9	8	95	140	155	195	—	—	8	M12	TW20	20	14	32	24.2								
100	100	230	200	165	8	19	M16	20	430	109	180	10	9	130	143	178	230	—	—	8	M16	TW22	22	14	36	35.3								
125	125	250	235	200	8	19	M16	20	495	135	200	11	10	145	177	195	265	—	—	8	M16	TW24	24	17	38	48.1								
150	150	270	265	230	8	19	M16	22	560	159	224	12	11	165	201	205	295	—	—	8	M16	TW26	26	19	42	65.3								
200	200	290	320	280	8	23	M20	24	680	211	280	14	13	210	249	230	365	—	—	8	M20	TW30	30	22	48	103								
250	250	330	385	345	12	23	M20	26	800	262	355	16	15	245	308	270	438	—	—	12	M20	TW34	34	27	54	164								
300	300	370	430	390	12	23	M20	28	920	313	400	18	16	275	374	310	520	—	—	12	M20	TW38	38	30	60	236								
350	335	410	480	435	12	25	M22	30	1000	350	450	19	17	300	412	340	580	—	—	12	M22	TW40	40	30	62	307								
400	380	470	540	495	16	25	M22	30	1100	394	500	21	18	330	466	360	640	380	660	14	M22	TW44	44	32	68	405								

- Remarks:
1. The flanges shall conform to nominal pressure 5 K of JIS B 2210.
 2. The threads d_6 shall conform to JIS B 0222, and d_{10} to JIS B 0205.
 3. The indicator plate shall, as a rule, be fitted on the same side as valve marking on the body.
 4. The stem may be partially altered to suit connecting with the transmission shaft.
 5. The name plate shall be specified by purchaser as required.
 6. The calculated mass are of valves in Class B.

Fig. 1 For nominal dia. 50 to 400



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