

Shipbuilding – Flat sight glasses

1. **Scope** This Japanese Industrial Standard specifies flat sight glasses used for monitoring water, lubricating oil and fuel oil in the engine department of ships (hereinafter referred to as “sight glass”).

Remarks: 1. In this standard units and numerical values in [] are in accordance with the conventional system of units, and shown for reference.

2. This standard makes reference to the following standards:

JIS B 2210 – Basic dimensions of ferrous material pipe flanges

JIS F 7400 – Ships valves and cocks – General inspection requirement

JIS G 3101 – Rolled steel for general structure

JIS G 3201 – Carbon steel forgings for general use

JIS G 5151 – Steel castings for high temperature and high pressure service

JIS G 5501 – Gray iron castings

JIS G 5502 – Spheroidal graphite iron castings

2. **Application standard** The application standard of sight glass shall be as given in **Table 1**.

Table 1 Application standard of sight glass

Kind of fluid	Maximum working temperature (°C)	Nominal pressure	Maximum working pressure MPa (kgf/cm ²)	Material of body	Material of glass (Heat resisting temperature °C)(²)
Water	100	5 K	0.49 [5]	JIS G 5501 –FC200 or JIS G 3101 –SS400	Polycarbonate (75)(³) Tempered glass (200)
		10 K	0.98 [10]		
Lubricating oil (excluding thermal oil)	200	5 K	0.49 [5]	JIS G 5501 –FC200 or JIS G 3101 –SS400	Tempered glass (200)
		10 K	0.98 [10]		
Fuel oil	60 or less	5 K	0.49 [5]	JIS G 5501 –FC200(¹) or JIS G 3101 –SS400	Tempered glass (200) Boro-silicated glass (230) 96% Silicate glass (900) Silica glass (1000)
		10 K	0.98 [10]		
	exceeding 60 but 150 or less	5 K	0.49 [5]	JIS G 5502 –FCD370 or FCD400 or JIS G 3101 –SS400	
		10 K	0.98 [10]		
	exceeding 150 but 230 or less	5 K	0.49 [5]	JIS G 5151 –FCPH2 or JIS G 3201 –SF440A or JIS G 3101 –SS400	
		10 K	0.98 [10]		

Notes: (¹) The maximum working pressure of FC200 is 0.70 Mpa [7.1 kgf/cm²].

When used for an atmospheric discharge pipe, this material may be used at temperatures at 60°C or more.

(²) When tempered glass is required, selection of glass shall be made according to the heat resistance required.

(³) When the temperature of the fluid exceeds 75°C, tempered glass shall be used.

3. **Construction** The body of the sight glass shall be of the flange type, and the connections to piping shall conform to the 5K flange or 10K flange specified in **JIS B 2210**.

The construction of the sight glass shall be such that two pieces of flat glass are arranged in the direction normal to the flowing direction.

The sight glass is designed with or without nozzle and with or without flappers.

Reference Fig. 1 shows an example of the sight glass without nozzle and with flappers.

4. **Dimensions** The face-to-face and visible dimensions of the sight glass shall be as given in Table 2.

Table 2 Face-to-face and visible dimensions of sight glass

Series No.		Unit: mm								
		Nominal dia.								
		15	20	25	32	40	50	65	80	100
Series A	Face-to-face	150	150	170	200	200	220	250	270	320
	Visible	40	40	50	70	70	80	100	120	150
Series B	Face-to-face	140	150	160	200	200	220	250	270	320
	Visible	40	50	50	60	60	65	80	102	125
Series C	Face-to-face	150	150	150	180	180	190	240	260	300
	Visible	42	42	42	62	62	70	105	120	145

Remarks: 1. This table shows in case of castings.
2. The face-to-face dimensions and visible dimensions when fabricated by steel sheets (pipe and weld type), shall be determined by agreement between the parties concerned.

5. **Materials** The materials of the sight glass body and glass shall be selected in accordance with the application standard given in Table 1.

6. **Tests and inspection** Inspections of the sight glass shall be carried out on the following items (1) through (5) in accordance with the requirements of JIS F 7400.

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

Hydraulic inspections shall be carried out at a test pressure 1.5 times the maximum working pressure.

7. **Designation** The designation of the sight glass shall be as follows:

- (1) Nominal pressure and nominal dia.
- (2) Body material
- (3) Glass material
- (4) Face-to-face dimension (Series No.)

8. **Makings** The following particulars shall be marked on the outer surface of the body:

- (1) Nominal pressure and nominal dia.

Example: 5K-15

- (2) Arrowhead showing the direction of flow
- (3) Date of manufacture or mark
- (4) Manufacturer's name or mark

- (a) Fig. 1.1 For valves of nominal diameters 6 and 10
- (b) Fig. 1.2 For valves of nominal diameters 15 to 40 (except for non-refillable non valves)
- (c) Fig. 1.3 For non-refillable non valves of nominal diameters 45 to 40
- (d) Fig. 1.4 For valves of nominal diameters 50 to 200
- (e) Fig. 1.5 For valves of nominal diameters 250 to 400