

Shipbuilding – Application of strainers

1. **Scope** This Japanese Industrial Standard specifies the application of strainers used for piping systems for oil, water and steam (hereinafter referred to as “strainers”) in ships.

Remark: This standard makes reference to the standards as follows:

- JIS B 2401 – O-rings
- JIS F 7121 – Shipbuilding – Can water filters
- JIS F 7202 – Shipbuilding – Duplex oil strainers
- JIS F 7203 – Shipbuilding – Bilge mud boxes for machinery spaces and tunnels – General design characteristics
- JIS F 7206 – Shipbuilding – Strum boxes
- JIS F 7207 – Shipbuilding – Oil strainer – Application for wire gauze
- JIS F 7208 – Shipbuilding – Duplex oil strainers (H type)
- JIS F 7209 – Shipbuilding – Simplex oil strainers
- JIS F 7220 – Shipbuilding – Cast iron Y type strainers
- JIS F 7224 – Shipbuilding – Small size duplex oil strainers
- JIS F 7225 – Shipbuilding – Steel plate simplex oil strainers
- JIS F 7226 – Shipbuilding – Steel plate cylindrical water filters
- JIS F 7233 – Shipbuilding – Steel plate cylindrical cargo oil strainers

2. **Application of strainers** Application of strainers shall be as given in **Tables 1 to 3** for every piping system.

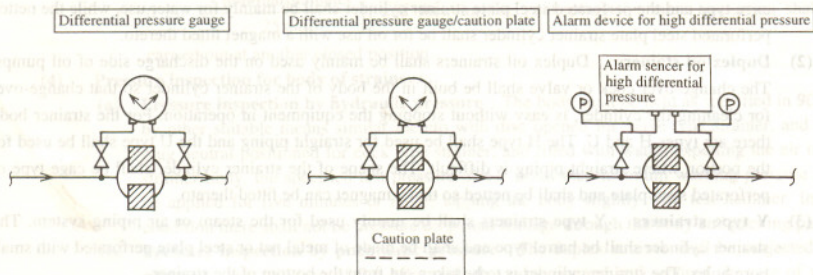
3. **Classified shapes of the strainers by function and their applications** The classified shapes of the strainers by function and their applications shall be in accordance with the following:

- (1) **Simplex strainers** Simplex strainers shall be mainly used on the suction side of water or oil pumps. For types of the strainer body there are types S, LA, and LB. The S type shall be used for the straight pipe and the types LA and LB shall be used for the bent pipe. The shape of the strainer cylinder is cage type and the perforated steel plate strainer cylinder shall be mainly for water use, while the netted perforated steel plate strainer cylinder shall be for oil use with a magnet fitted thereto.
- (2) **Duplex oil strainers** Duplex oil strainers shall be mainly used on the discharge side of oil pumps. The change-over cock or valve shall be built in the body of the strainer cylinder so that change-over for cleaning the cylinder, is easy without stopping the equipment in operation. For the strainer body there are types H and U. The H type shall be used for straight piping and the U type shall be used for the portion where straight piping is difficult. The shape of the strainer cylinder shall be cage type of perforated steel plate and shall be netted so that a magnet can be fitted thereto.
- (3) **Y type strainers** Y type strainers shall be mainly used for the steam or air piping system. The strainer cylinder shall be barrel type and shall be made of metal net or steel plate perforated with small bore holes. The strainer cylinder is to be taken out from the bottom of the strainer.
- (4) **Mud box** The mud box is used for the bilge suction piping in the bilge well. The types of the body are types S and L. The S type shall be used for bilge main and L type shall be used for straight tail pipe. The strainer plate shall be made of two perforated steel plates and shall be used after built up in V-shape.
- (5) **Rose box** The rose box is used for the end of the bilge suction pipe and the hold and void space. The shape shall be square perforated steel plate and the rose box shall have a construction dividable into two by removing assembly pin for easy cleaning.

4. Classified application of strainers by system

4.1 Oil pipe system Application to the oil pipe system shall be as follows:

- (1) The mesh of the wire gauze of the strainers shall conform to **JIS F 7207**.
- (2) The net flow area ratio shall be determined for each strainer in consideration of the relation between the wire gauze mesh and the flow area ratio of the strainer cylinders.
- (3) The wire gauze mesh applied to the "oil strainers" specified in Marine **JIS** is approximately 250 mesh at maximum. When wire gauze of 150 mesh or more is used, it is recommended that one rank larger sizes are selected for the strainer body and cylinder in consideration of strength of the wire gauze and flow area ratio depending on the mesh size.
- (4) The O-ring used for body cover shall conform to **JIS B 2401**. However, when used at the temperature exceeding fluid temperature of 80°C, it is recommended that the requirements of **JIS B 2401** Class 4D be complied with.
- (5) It is recommended that magnets are fitted to the strainer to prevent the damage to the abrasive sliding motions or the moving parts of the device due to residual iron powder in the piping.
- (6) Use of high-mesh oil strainers (250 mesh or more, or 50 μm or less)
 - (a) **Criteria for loading of strainers** The clogging elements of oil strainer (simplex and duplex) in service should preferably be transferred to a stand-by strainer element for cleaning when the pressure difference across the strainer inlet and outlet reaches 0.049 - 0.069 MPa in consideration of the construction of the strainer.
 - (b) **Installation of differential pressure gauges or high differential pressure alarm devices** It is recommended that inlet/outlet differential pressure gauges, or a set of differential pressure gauge and caution plate, or high-differential pressure alarm device are fitted for those particularly important oil strainers (main lubricating oil secondary, crosshead lubricating oil secondary, camshaft lubricating oil secondary, main engine fuel oil secondary and tertiary, generator engine fuel oil secondary and tertiary etc.) installed in both lubricating oil piping system supplying lubricating oil to machinery parts that undergo abrasive sliding motions and fuel oil piping system in order to prevent machinery failures.



- (c) It is recommended that the transferring of the cock handle of the duplex type oil strainer be carried out as rapid as possible so that by-passing oil flow across the oil strainer from inlet and to the outlet owing to possible lifting of the cock during transfer operation can be prevented.

Reference: The weld repairs inspection of steel castings recommended to be carried out in accordance with JIS B 7201 of Japan Marine Standards.

4.2 Water pipe system The application to the water pipe system shall be as follows:

- (1) It is recommended that the inside of the strainers used for seawater be given the same anticorrosive treatment as for the pipe system of the same application.
- (2) When lining or coating is applied inside the body and cover of the strainers to prevent electrolytic corrosion, application of lining or coating to other plug screw portion is impossible. And it is recommended that the plug screw portion be of screw cap type outside the body or of flange type.
- (3) When the tube type cooler is used for seawater line, any trouble is not caused because the internal diameter of the cooler tube is larger than the hole diameter 8 mm of seawater strainer. However, in case of the plate type cooler, since the space between plates is smaller than the strainer cylinder diameter, the hole diameter shall be smaller than the plate-to-plate space. Also since the smaller hole diameter makes anticorrosive treatment incomplete, the use of stainless steel plate is recommended.
- (4) It is recommended that the strainers used for bilge pipe system be provided with net on the strainer cylinder for the protection of the bilge pump and bilge separator. It is also recommended that the mesh of the wire gauze be determined by referring to the value suggested by the manufacturer of the device and JIS F 7207.
- (5) It is recommended that the strainers used for fresh water pipe system be provided with net on the strainer cylinder for filtering out solids as these are mainly used for suction of pumps and piping of drinking water.
- (6) When the netted strainer cylinder is used for the bilge and fresh water pipe system, use of the simplex oil strainers is recommended.

The anticorrosive treatment compatible with that for the piping system is recommended.

4.3 Cargo oil pipe system When applied to the cargo oil pipe system it is recommended that the strainer cylinder hole diameter be approximately 10 mm without netting, because the strainer cylinder is used for removing large solids.

4.4 Steam and air pipe system When applied to the steam and air pipe systems, the standard strainers of the manufacturers are mainly used for the inlet side of the reducing valve and regulating valve to maintain the performance of valves. And it is recommended that the strainers in Marine JIS given in Table 3 be referred to in placing orders.

4.5 Marine JIS scope of standard related to strainers Marine JIS scope of standard related to the strainers are given in Reference Table 1.

Reference Standards:

JIS F 7222 – Shipbuilding – Cast steel 40 K Y type steam strainers

JIS F 7223 – Marine small size water strainers

ISO 5208 – Industrial valves – Pressure testing for valves



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