

RULES

FOR THE CLASSIFICATION AND CONSTRUCTION OF SMALL SEA FISHING VESSELS

PART VIII SYSTEMS AND PIPING

ND No. 2-020101-160-E



**St. Petersburg
2022**

RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF SMALL SEA FISHING VESSELS

Rules for the Classification and Construction of Small Sea Fishing Vessels of Russian Maritime Register of Shipping (RS, the Register) have been approved in accordance with the established approval procedure and come into force on 1 January 2022.

The present edition of the Rules is based on the 2021 edition taking into account the amendments and additions developed immediately before publication.

The Rules are published in the following parts:

Part I "Classification";

Part II "Hull";

Part III "Equipment, Arrangements and Outfit";

Part IV "Stability and Freeboard";

Part V "Subdivision";

Part VI "Fire Protection";

Part VII "Machinery Installations";

Part VIII "Systems and Piping";

Part IX "Machinery";

Part X "Boilers, Heat Exchangers and Pressure Vessels";

Part XI "Electrical Equipment";

Part XII "Refrigerating Plants";

Part XIII "Materials";

Part XIV "Welding";

Part XV "Automation";

Part XVI "Structure and Strength of Fiber-Reinforced Plastic Ships";

Part XVII "Radio Equipment";

Part XVIII "Navigational Equipment".

REVISION HISTORY

(Purely editorial amendments are not included in the Revision History)

For this version, there are no amendments to be included in the Revision History.

1 GENERAL

1.1 APPLICATION

1.1.1 Requirements of this Part of the Rules for the Classification and Construction of Small Sea Fishing Vessels¹ apply to the following systems and piping:

- .1** bilge;
- .2** air, overflow and sounding;
- .3** exhaust gas;
- .4** ventilation;
- .5** liquid oil fuel;
- .6** water cooling;
- .7** ballast.

¹ Hereinafter referred to as "these Rules".

1.2 GENERAL REQUIREMENTS

1.2.1 Depending on the purpose, it is allowed to use pipes and fittings made of steel, copper and copper alloys, plastic.

1.2.2 Plugs and threaded parts of the deck sleeves of sounding pipes shall be made of bronze or brass.

1.2.3 When it is necessary to provide mobility of piping connections with engines or other machinery, flexible joints (hoses) of approved type may be used. Flexible joints shall comply with the requirements of 2.1.8, Part VIII "Systems and Piping" of the Rules for the Classification and Construction of Sea-Going Ships¹ and their number and length shall be minimal.

¹ Hereinafter referred to as "the Rules for the Classification".

1.3 BOTTOM AND SIDE FITTINGS

1.3.1 Bottom and side fittings below the bulkhead deck, bottom fittings or gaskets shall have no components, the material of which would readily deteriorate in the event of fire.

The spindles and closing parts of bottom and side fittings shall be made of corrosion-resistant materials.

1.3.2 The number of openings in shell plating shall be kept to a minimum.

1.3.3 Inlet openings in shell plating may be done as slots or holes in the ship's hull and shall be fitted with gratings. The net area through the gratings or slots shall not be less than 2,5 times the area of the fitting.

1.3.4 Sea inlets and discharges shall have valves or sluice valves locally controlled. The valve controls shall be located in easily accessible places and shall be fitted with an indicator to show whether the valve is open or closed. Bottom and side fittings, as a rule, shall be attached to welded pads. The stud holes shall not penetrate the shell plating and shall be only within the welded pads. Gaskets made of lead or other materials, which easily deteriorate in the event of fire, are not allowed.

1.4 PIPING LAYING

1.4.1 Where pipelines pass through watertight bulkheads, there shall be used appropriate bulkhead sleeves, welded pads or other details to ensure the integrity of the structure.

1.4.2 Pipelines shall be secured in a way as not to interfere with the stresses from thermal expansion, undue deformation of ship's structure and vibration.

1.4.3 Pressure pipes are not permitted to be carried above and behind the main switchboard, as well as the control panels of essential machinery and equipment. Such pipes may be carried at a distance not less than 0,5 m from the fronts and sides of the main switchboard and control panels, provided that at a distance less than 1,5 m from the main switchboard and control panels no detachable joints are used or the flanged joints have protective casings.

2 BILGE SYSTEM

2.1 PUMPS

2.1.1 Each ship shall be provided with at least two bilge pumps; one of them shall be electrically driven or main engine driven pump, while water ejector or hand pump may be used as the second pump. V-belt drive from the main engine to the pump shall reliably provide torque transmission in case one of the belts is broken.

2.1.2 Independent general service pumps of sufficient capacity may be used as bilge pumps.

2.1.3 The pump for main engine cooling with sea water may be used as the emergency bilge pump.

2.1.4 Centrifugal bilge pumps shall be of self-priming type.

2.1.5 Each electrically driven bilge pump shall have a capacity at least 10 m³/h; capacity of hand pump shall not be less than 1,2 l per piston stroke.

2.2 PIPING

2.2.1 The internal diameter of the main bilge line and that of bilge suction shall not be less than 25 mm, while the internal diameter of the pipes directly connected to the pump shall not, in any case, be less than the bilge pump suction diameter.

2.2.2 The bilge lines and their bilge suction shall be so arranged as to enable any watertight compartment to be drained by any pump, and to enable one of the pumps to be operated in case the rest of pumps are inoperative or are used for other purposes.

2.2.3 Bilge suction with readily accessible mud boxes shall be installed by both sides of the machinery space in its after end. The pipes between the mud boxes and bilges shall be as straight as practicable. No strum boxes, filters and mud boxes shall be fitted for emergency bilge drainage.

2.2.4 Machinery space bilge system shall comply with the requirements of the Rules for the Prevention of Pollution from Ships Intended for Operation in Sea Areas and Inland Waterways of the Russian Federation.

2.2.5 In all self-propelled ships provision shall be made for emergency drainage of the machinery spaces. The diameter of the emergency bilge suction shall not be less than that of the suction branch of the pump used for this purpose and shall have non-return stop valve with the spindles extended above the machinery space floor plates, having nameplate "For emergency use only".

2.2.6 For each hull of a ship with twin hulls, an independent bilge system shall be provided complying with the requirements of this Chapter.

2.2.7 Bilge system of the ship's spaces shall comply with the requirements of Section 7, Part VIII "Systems and Piping" of the Rules for the Classification.

3 AIR, OVERFLOW AND SOUNDING PIPES

3.1 AIR PIPES

3.1.1 All tanks intended for storage of liquid shall have air pipes.

3.1.2 The air pipes of the tanks shall be fitted at the highest part of the tanks at a place that is at the maximum distance from the filling pipes. Arrangement of pipes shall be selected depending on the conditions precluding the formation of air pockets. The air pipes shall not be used as filling pipes. The cross-section area of the air pipes of the tanks filled by gravity shall not be less than that of filling pipes; in case the pumps are used, it shall not be less than 1,25 times the cross-section area of filling pipes.

3.1.3 The outlet of each air pipe shall have permanently attached selfclosing covers in compliance with the requirements of 10.1.8, Part VIII "Systems and Piping" of the Rules for the Classification and have another construction approved by the Register preventing the sea water from getting into the tanks.

3.1.4 The outlets of air pipes of fuel oil tanks shall be led to the open deck. Where in ships the fuel with flash point $< 60\text{ }^{\circ}\text{C}$ is used, the outlets of air pipes of fuel oil tanks shall be protected with flame-arresting fittings; the clear area through the fitting shall not be less than open flow area of the air pipe.

3.1.5 The height of air pipes measured from the deck to the point where water may have access below shall not be less than 600 mm on the freeboard deck and not less than 380 mm on superstructure deck. An inner diameter of the air pipes shall not be less than 50 mm.

3.1.6 Nameplates shall be affixed to the outlets of air pipes.

3.2 OVERFLOW PIPES

3.2.1 Oil fuel tanks shall be provided with overflow pipes directing fuel to an overflow tank or storage tank having the capacity not less than the maximum capacity of the fuelling and fuel transfer system within 10 min.

No overflow pipes may be fitted where the oil fuel system is so designed that no spilling overboard may occur during the loading and transfer of fuel.

3.2.2 The minimum overflow pipe bore shall be 50 mm. Cross-section area of overflow pipes shall be the same as indicated for air pipes in [3.1.2](#).

3.2.3 Where air pipes are simultaneously used as overflow pipes, they shall not be connected to the air pipes of overflow tanks. In this case, the overflow pipes of a common overflow pipe shall be connected directly to the tank.

3.2.4 The overflow pipes of daily fuel and lube oil tanks shall be led to overflow tanks located below the tanks mentioned above.

3.2.5 A sight glass shall be fitted on vertical overflow pipe at readily visible and accessible location, or an alarm device shall be provided to give warning when the predetermined level is reached in the overflow tank.

3.2.6 An overflow tank shall be provided with audible and visual alarms operating whenever the tank filling reaches 75 %.

3.3 SOUNDING ARRANGEMENTS

3.3.1 Each tank intended for storage of liquid, cofferdams and void spaces with bilge connections, as well as bilges and bilge wells in spaces, which are not accessible at all times, shall be provided with sounding pipes or other approved level indicators.

3.3.2 Level indicators of fuel tanks fitted with transparent insertions shall be protected against the damage. Transparent thermal-resistant insertions shall be made of flat glass or shatterproof plastics, which do not lose transparency during interaction with fuel. Self-closing cocks shall be fitted between the level indicator and the fuel tank.

3.3.3 The internal diameter of the sounding pipes shall not be less than 25 mm.

3.3.4 The upper ends of the sounding pipes led to the open deck shall be fitted with tight threaded plugs complying with the requirements of [1.2.2](#).

3.3.5 The upper ends of the sounding pipes of fuel and oil tanks, which led to the machinery spaces, shall be fitted with self-closing blanking devices and with a self-closing cocks located below them. Structural measures shall be taken to prevent the spillage of fuel or oil on heated surfaces from the blanking device. The pipes shall terminate at least 0,5 m above the plating.

3.3.6 Provision shall be made under the open ends of the sounding pipes for welded striking plates or other strengthening to protect the bottom plating from damaging by a sounding rod. In case of slotted sounding pipes with close ends, adequately strong closing plugs shall be provided.

3.3.7 Nameplates, made of sea water resistant material, shall be affixed to the sounding pipes.

4 EXHAUST GAS SYSTEM

4.1 EXHAUST GAS PIPING

4.1.1 The exhaust gas pipes shall, as a rule, be led to the open decks.

4.1.2 Where the exhaust gas pipes are led through the shell plating in the vicinity of load waterline or below it, provision shall be made for arrangements precluding the possibility of sea water entering the engine.

4.1.3 Each internal combustion engine shall have an individual exhaust gas pipe with thermal compensators, silencer with fire extinguishing system and spark arrestor of the construction approved by the Register. When necessary, deviations may be allowed according to 11.1.5, Part VIII "Systems and Piping" of the Rules for the Classification.

4.1.4 The exhaust gas pipes of internal combustion engines shall be led at a distance not less than 0,45 m from the oil fuel tanks.

4.1.5 The exhaust gas pipes of internal combustion engines shall be thermally insulated by means of thermal insulating material, double walls or screen. It is allowed not to insulate exhaust gas pipes of internal combustion engines with "wet" exhaust, if the temperature on the pipe surfaces does not exceed 60 °C.

4.1.6 The exhaust gas pipes of internal combustion engines shall have draining devices preventing the entry of water into the engine. Drain pipe bore of draining devices shall not be less than 25 mm.

5 VENTILATION SYSTEM

5.1 VENTILATION DUCTS AND VENTILATOR HEADS, AIR INLETS

5.1.1 As a rule, ventilation ducts shall not be led through the watertight bulkheads.

5.1.2 Where trunkways and vertical ducts of the ventilation system pass through the decks, they shall be watertight and equivalent in strength to the local hull structures.

5.1.3 Ventilation ducts shall be protected against corrosion or constructed of corrosion-resistant materials.

5.1.4 Ventilation ducts leading to machinery spaces and other spaces fitted with smothering facilities shall have gastight closing arrangements actuated outside the serviced spaces.

5.1.5 In places of possible sweating the ventilation ducts shall be insulated and drain plugs shall be provided for the portions of ducts where water is likely to accumulate.

5.1.6 The ventilator heads of supply ducts and the air inlets of the ventilation system shall be so located that the risk of drawing in contaminated air is minimized, and admission of sea water into the ventilation ducts is precluded.

5.2 VENTILATION OF MACHINERY AND SERVICE SPACES

5.2.1 The ventilation of machinery spaces shall be such as to ensure the sufficient supply of air required for operation of machinery and devices at full load in all service conditions.

5.2.2 The ventilation of machinery spaces shall be serviced by separate intake and exhaust ducts.

5.2.3 Cross-section of natural ventilation ducts F , in cm^2 , is determined by the formula

$$F = 40V \quad (5.2.3)$$

where V = volume of the ventilated machinery space, in m^3 (excluding the volumes occupied by machinery and equipment).

In all cases F shall not be less than 45 cm^2 .

5.2.4 Ventilation of accumulator battery rooms and boxes shall be independent and comply with the requirements of 12.10, Part VIII "Systems and Piping" of the Rules for the Classification. The cross-section area of the natural ventilation duct shall not be less than 40 cm^2 .

5.2.5 Store rooms for flammable materials shall be provided with ventilation in compliance with the requirements of 2.1.5, Part VI "Fire Protection" of the Rules for the Classification.

5.2.6 Fire smothering stations shall be equipped with efficient ventilation system. The carbon dioxide fire-extinguishing station shall be provided with an independent exhaust and supply ventilation system. The inlets of exhaust ducts shall be located in the lower parts of the station.

6 LIQUID FUEL SYSTEM

6.1 PIPING LAYING

6.1.1 The fuel pipelines shall be made of steel or other material complying with the Register requirements regarding strength and fire resistance.

6.1.2 The fuel pipelines shall not be led above the engines and exhaust gas pipes. In exceptional cases, it is allowed to lead the fuel pipes above the mentioned equipment, provided that in these positions the pipes have not detachable joints or the provision shall be made for preventing the spillage of fuel on the mentioned equipment.

6.1.3 The bunkering of the ship shall be carried out through a permanent pipeline. The filling pipeline shall be connected to the tanks near the top and run down to the tank bottom to a minimal gap. After bunkering of the ship the filling pipeline shall be safely closed (with a screw plug). The plug shall be made of copper-based alloy.

6.2 TANKS

6.2.1 The fuel tanks, as a rule, shall represent part of the ship hull structures.

6.2.2 Requirements to fuel tanks arrangement are stated in 4.3, Part VII "Machinery Installations".

6.2.3 The main and auxiliary engines shall be supplied with the prepared fuel from the service tank with the minimum capacity sufficient for 8 h operation of the ship machinery installation at the maximum working load.

6.2.4 When the design fuel store for the specified area of navigation does not exceed the daily consumption of machinery installation at the maximum working load, it is allowed to allocate this store together with an additional 20 % emergency store in one service tank, which shall be generally arranged at the ship center plane. In this case the received fuel shall be cleaned and prepared by the shore station to the extent required for the engines installed.

6.2.5 Service tank shall be fitted with heat-resistant level indicator, closing valve (quick-closing valve is recommended) installed directly on the tank, with remote closing from always accessible position outside the space where the tank is located, self-closing drain valve and the minimum fuel level alarm with signal transmission to the wheelhouse.

6.2.6 Independent tanks, pumps, filters and other equipment in the places of possible fuel leakage shall be fitted with leakproof drip trays with drain pipes led into the drain tank with 80 % filling warning alarm. Drainage of oil fuel into the bilges is not permitted. The internal diameter of drain pipes shall not be less than 25 mm.

6.2.7 Where the drain tank is situated in the double-bottom space, structural measures shall be taken to prevent penetration of water into machinery space through the open ends of the drain pipes in the event of damage to the shell plating.

6.3 PUMPS

6.3.1 Mechanically driven fuel transfer pump and a standby hand pump shall be provided for fuel transfer from the storage tanks to the service tanks. In ships with a daily consumption of fuel less than 1 t, a hand pump is admissible.

Any suitable pump, including the fuel separator pump, may be used for standby purpose.

6.3.2 The fuel transfer pumps and the separator pumps, besides local hand control, shall be provided with stopping means operable from always accessible positions outside the space where the pumps are installed.

7 WATER COOLING SYSTEM

7.1 PUMPS

7.1.1 Water cooling system of main and auxiliary engines, and reduction gears shall be equipped with two pumps, one of which is a standby pump driven independently. The capacity of standby pump shall provide both fresh or sea water cooling of any engine; at that precautions shall be taken to prevent mixing of fresh and sea water.

7.1.2 The general service pumps, driven independently, operated only for clean water may be used as the standby pumps.

7.2 PIPING

7.2.1 A filter shall be fitted on the suction pipelines of water cooling system servicing the main and auxiliary engines; the filter design shall provide its cleaning without having to stop the pumps. The filter shall be provided with a facility that makes it possible to be sure, before the filter is opened up, that there is no pressure.

7.2.2 The arrangement of the sea water discharge pipeline shall be such that the highest cooled spaces of the engines, water coolers and oil coolers are always filled with water and formation of trapped zones is excluded.

7.2.3 In the two-circuit water cooling system of the engine provision shall be made for an expansion tank where the level of water is higher than the maximum level of water in the engine.

7.2.4 The pipes and equipment used in the sea water cooling system shall be protected against corrosion in compliance with 1.4, Part VIII "Systems and Piping" of the Rules for the Classification, or made from corrosion-resistant materials.

8 BALLAST SYSTEM

8.1 PIPING

8.1.1 Requirements for piping and fittings are specified in Section 8, Part VIII "Systems and Piping" of the Rules for the Classification.

8.2 PUMPS

8.2.1 The ballast system shall be serviced by at least one pump. The general service pumps may be used as ballast pumps, including bilge, fire or standby cooling water pumps.

8.2.2 Where the oil fuel tanks are generally used as ballast tanks, then the reliable devices shall be provided for disconnection of the ballast system from the liquid oil fuel system. The standby cooling water pump or the fire pump shall not be used for ballasting, nor shall the ballast pump be used as the standby cooling water pump or fire pump.

9 LUBRICATING OIL SYSTEM

9.1 When it is necessary to equip the ship with a lubricating oil system, the requirements for the manufacture and mounting of the pumps, tanks and piping shall be agreed upon with the Register on the basis of the general requirements of Section 14, Part VIII "Systems and Piping" of the Rules for the Classification.

Russian Maritime Register of Shipping

**Rules for the Classification and Construction of Small Sea Fishing Vessels
Part VIII
Systems and Piping**

FAI "Russian Maritime Register of Shipping"
8, Dvortsovaya Naberezhnaya,
191186, St. Petersburg,
Russian Federation
www.rs-class.org/en/