

within the tanks, the thickness of the piping is not to be less than that given in Tab 26, column 1 (substantial thickness). It need not, however, exceed the thickness of the adjacent Rule shell plating.

- c) Scupper and sanitary discharge pipes are normally not to pass through fresh and drinking water tanks.
- d) For passage through cargo oil tanks, see Pt D, Ch 7, Sec 4.

Table 26 : Minimum thickness of scupper and discharge pipes led to the shell

External diameter of the pipe d (mm)	Column 1 substantial thickness (mm) (1)	Column 2 normal thickness (mm)
$d \leq 80,0$	7,00	4,50
155	9,25	4,50
180	10,00	5,00
220	12,50	5,80
$230 \leq d$	12,50	6,00
(1) For pipes connected to the shell below the freeboard deck, refer to minimum extra-reinforced wall thicknesses given in Tab 6.		
Note 1: Intermediate sizes may be determined by interpolation.		

8.11.4 Passage through watertight bulkheads or decks

- a) The intactness of machinery space bulkheads and of tunnel plating required to be of watertight construction is not to be impaired by the fitting of scuppers discharging to machinery spaces or tunnels from adjacent compartments which are situated below the freeboard deck.
- b) Such scuppers may, however, be led into a strongly constructed scupper drain tank situated in the machinery space or tunnel, but close to the above-mentioned adjacent compartments and drained by means of a suction of appropriate size led from the main bilge line through a screw-down non-return valve.

8.11.5 Discharge in refrigerated spaces

No scupper pipe from non-refrigerated spaces is to discharge in refrigerated spaces.

8.11.6 Discharge from galleys and their stores

Discharges from galleys and their stores are to be kept separate from other discharges and be drained overboard or in separate drainage tanks; alternatively, discharges are to be provided with adequate devices against odours and overflow.

8.11.7 Discharge from aft spaces

Where spaces located aft of the aft peak bulkhead not intended to be used as tanks are drained by means of scuppers discharging to the shaft tunnel, the provisions of [6.6.4] item c) are to be complied with.

8.11.8 Scupper tank

- a) The scupper tank air pipe is to be led to above the freeboard deck.
- b) Provision is to be made to ascertain the level of water in the scupper tank.

8.11.9 Drains from the funnels

Drain line from the funnel or stack top should not terminate on an exposed deck owing to the soot that may be contained in the wastewater. Except otherwise specified, this line may be connected to other lines draining exposed decks and leading directly overboard, taking into consideration the quantity of wastewater occurring.

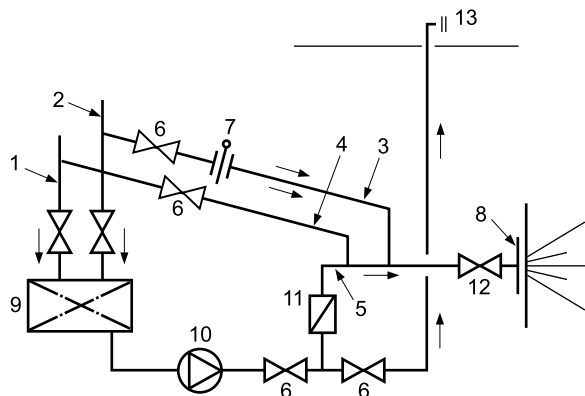
8.11.10 Sewage and grey water discharges

The requirements specified below are general and should apply to any ship fitted with sewage and grey water piping systems. They are not sufficient for the compliance with MARPOL Annex IV and for additional class notation **CLEANSHIP**. Furthermore, the National Authority of the country in which the ship is to be registered may also have additional requirements.

- a) Except otherwise specified, the sewage (or black water) means:
 - drainage and other wastes from any form of toilets, urinals, and WC scuppers
 - drainage from medical premises (dispensary, sick bay, etc.) via wash basins, wash tubs and scuppers located in such premises
 - drainage from spaces containing living animals; or
 - other waste waters when mixed with the drainages defined above.
- b) Grey water means other sanitary discharges which are not sewage.
- c) In general, sewage systems should be of a design which will avoid the possible generation of toxic and flammable gases (such as hydrogen sulphide, methane, ammonia) during the sewage collection and treatment. Additional means of protection is to be suitable ventilation of the pipework and tanks.
- d) Drain lines from the hospital area should be, as far as practicable, separated from other discharges and fitted to the drain collector at the lowest level.
- e) Sewage and grey water may be collected into storage tanks together or separately, either for holding prior to transfer to a treatment unit, or for later discharge. Any tank used for holding sewage shall comply with the following:
 - suitable air pipes shall be fitted, leading to the open deck
 - design and configuration of those tanks should be such as to facilitate the effective drainage and flushing of the tanks
 - suitable means for flushing of the tanks shall be provided
 - such tanks are to be efficiently protected against corrosion
 - tanks shall have a means to indicate visually the amount of its content and, for additional class notation **AUT**, high level alarm is to be fitted
 - suitable means for emptying sewage tanks through the standard discharge connection to reception facilities shall be provided. Ballast and bilge pumps are not to be used for that purpose.

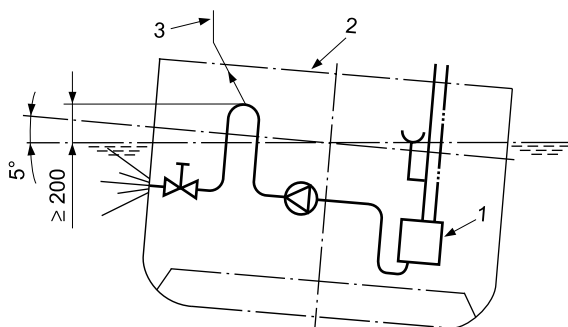
- f) Air pipes from the sewage and grey water systems are to be independent of all other air pipes and to be led to the outside of the ship, away from any air intake. Such pipes should not terminate in areas to which personnel have frequent access and should be clear of any sources of ignition.
- g) The overboard discharges shall be located as far from seawater inlets as possible, seen in the direction of travel. In general, the sewage outlets should be located below the summer loadline.

Figure 4 : Sewage and grey water overboard discharge typical arrangement



- 1 grey water drain line
- 2 sewage water drain line
- 3 bypass line for sewage
- 4 bypass line for grey water
- 5 sewage disposal line
- 6 shutoff gate valve
- 7 spectacle flange, optional
- 8 overboard discharge
- 9 collector tank or treatment unit
- 10 pump
- 11 non-return valve
- 12 screw-down overboard valve
- 13 standard discharge connection.

Figure 5 : Typical overboard discharge arrangement without non-return valve



- 1 collector tank or treatment unit
- 2 freeboard deck
- 3 vent (leading on top of funnel).

- h) The sewage and grey water discharge lines are to be fitted at the ships' side with screw-down valve and non-return valve. Possible characteristic arrangement is shown on Fig 4.

The non-return valve may be omitted where a pipe loop is fitting on discharge line, provided that the lowest part of the loop is at least 200 mm above the waterline with the ship on summer loadline draft and when the ship has a 5° list (see Fig 5).

9 Air, sounding and overflow pipes

9.1 Air pipes

9.1.1 Principle

Air pipes are to be fitted to all tanks, double bottoms, cofferdams, tunnels and other compartments which are not fitted with alternative ventilation arrangements, in order to allow the passage of air or liquid so as to prevent excessive pressure or vacuum in the tanks or compartments, in particular in those which are fitted with piping installations. Their open ends are to be so arranged as to prevent the free entry of sea water in the compartments.

9.1.2 Number and position of air pipes

- a) Air pipes are to be so arranged and the upper part of compartments so designed that air or gas likely to accumulate at any point in the compartments can freely evacuate.
- b) Air pipes are to be fitted opposite the filling pipes and/or at the highest parts of the compartments, the ship being assumed to be on an even keel.
- c) In general, two air pipes are to be fitted for each compartment, except in small compartments, where only one air pipe may be accepted. When the top of the compartment is of irregular form, the position of air pipes will be given special consideration by the Society.

Note 1: Two air vents are normally required for long tanks e.g. a ballast tank in a double hull ship.

In machinery spaces, two air vents are not normally required.

- d) Where only one air pipe is provided, it is not to be used as a filling pipe.

9.1.3 Location of open ends of air pipes

- a) Air pipes of double bottom compartments, tunnels, deep tanks and other compartments which can come into contact with the sea or be flooded in the event of hull damage are to be led to above the bulkhead deck or the freeboard deck.

Note 1: In ships not provided with a double bottom, air pipes of small cofferdams or tanks not containing fuel oil or lubricating oil may discharge within the space concerned.

- b) Air pipes of tanks intended to be pumped up are to be led to the open above the bulkhead deck or the freeboard deck.