Section 6.0

VENTILATION SYSTEMS

ISSUE NUMBER: 3
DATE: 2004 Edition
NUMBER OF PAGES: 5

THIS ISSUE SUPERSEDES
Issue Number: 2
Dated: January 2002

6.1 Application

6.1.1 This section applies in respect of all small vessels.

6.2 General

6.2.1 Neither supply nor exhaust air ducts from engine spaces or engine exhaust outlets shall open into an accommodation space.

6.2.2 Electrical components installed in gasoline engine spaces, gasoline tank spaces, and any connecting spaces not open to the atmosphere shall be ignition protected in accordance with Section 8 of this Standard.

6.3 Gasoline Engine and Fuel Tank Space Ventilation

6.3.1 Application

6.3.1.1 This subsection applies to all vessels, regardless of length or accommodation that have gasoline engines for propulsion or other purposes.

6.3.2 Removal of Combustible Vapours

6.3.2.1 Combustible vapours shall be removed from closed engine and fuel tank spaces by means of a ventilation system.

6.3.2.2 Open engine or fuel tank spaces do not require a separate ventilation system if in compliance with subsection 6.3.3.

6.3.3 Open Spaces Vessel Construction

6.3.3.1 A separate ventilation system is not required if an engine or fuel tank space has the following (see Figure 6–1):

(a) at least 0.34 m^2 (3.5 ft^2) of area exposed to the atmosphere per cubic metre (35 ft^3) of net space volume; and

(b) no long or narrow unvented spaces in which a flame front might propagate.

6.3.3.2 The net space volume is the volume of the engine or fuel tank space plus the volume of connecting spaces, unless the connecting spaces either:

(a) connect to spaces already ventilated by ducting; or

(b) themselves qualify as open spaces.

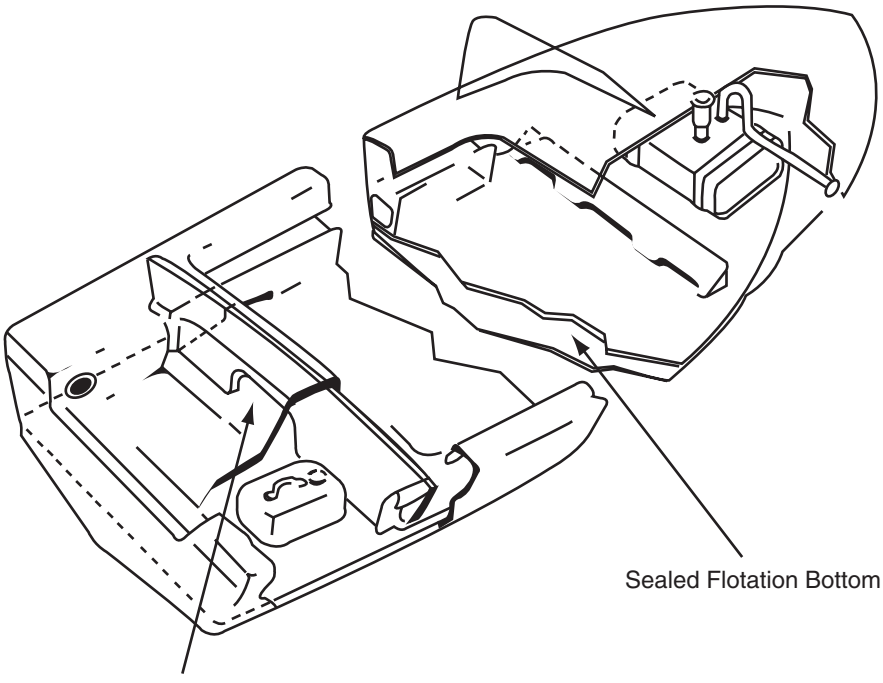
6.3.3.3 Spaces connecting with spaces open to the atmosphere, which have interconnecting openings with an area equal to 2% or less of the separation bulkhead, shall not be considered as open spaces.

6.3.3.4 The volumes of adjacent spaces shall be included in the calculation of duct sizes if the collective area of the openings in the separation bulkheads exceeds 2% of the separation bulkhead area between these spaces.

6.3.3.5 The separation bulkhead area used for the calculations in paragraph 6.3.3.4 and 6.3.3.3 shall be calculated using a height that is the lesser of either the distance between the bottom and top of the bulkhead between the spaces, or 750 mm (30 in).

6.3.3.6 Long narrow spaces formed by side panels or accommodation decks shall have openings at both ends or along the sides in order to qualify as open spaces.

Figure 6–1 Open Spaces Vessel Construction



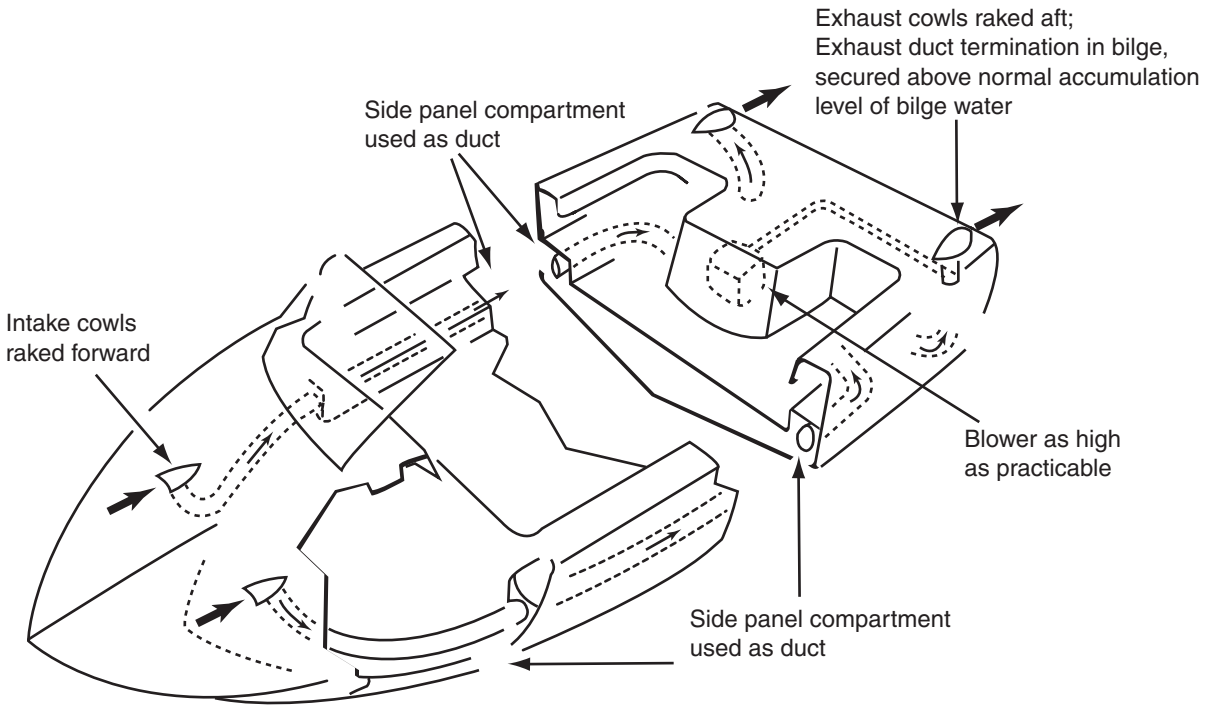
6.3.4 Closed Spaces Vessel Construction

6.3.4.1 A separate ventilation system is required if an engine or fuel tank space conforms to the following:

(a) the space has less than 0.34 m^2 (3.5 ft^2) of area exposed to the atmosphere per cubic metre (35 ft^3) of net space volume; or

(b) does not otherwise meet the requirements for an open space.

Figure 6–2 Closed Spaces Vessel Construction



6.3.5 Underway Ventilation

6.3.5.1 Every closed engine space and every closed space containing a permanent or portable fuel tank shall be provided with a ventilation system designed to remove any accumulation of combustible vapours.

6.3.5.2 At least one exhaust duct shall extend down to the bilge of the space from which the fumes are to be expelled. If the space is an engine space, the exhaust duct entrances shall be located as nearly as practicable under the engine, or engines.

6.3.5.3 Duct termination in bilges shall be secured above the level of normal accumulations of bilge water.

6.3.5.4 Ventilation openings shall be located, where practicable, on the deck, but so located to minimize the ingress of water, taking into account all service conditions of heel, trim, wave action, loading, and reverse operations.

6.3.6 Ducts

6.3.6.1 The minimum collective internal cross-sectional area of ducts shall be calculated as per ABYC *Standards for Small Craft* H–2.

6.3.6.2 If the engine or fuel tank space connects to an adjoining closed space, the total net volume of both the space and closed space shall be used to determine the required duct size.

6.3.6.3 Non-metallic materials used for ventilating ducts and components installed below deck shall be capable of continuous exposure to a temperature range of –30°C to 85°C without failure.

6.3.6.4 Non-metallic ventilating ducts and components shall be installed at least 230 mm (9 in) clear to the side and below, and 460 mm (18 in) above any surface capable of reaching a temperature of 150°C, unless those components are designed for use in higher temperature locations.

6.3.7 Cowls and Ventilation Openings

6.3.7.1 External openings of intakes and exhausts shall be located and oriented to prevent entry of fuel vapors. In no instance shall the intakes and exhausts be closer than 15 inches (380mm) from the gasoline fill and tank vent fittings.

6.3.7.2 No component of the ventilation system shall restrict the minimum required duct size.

6.3.7.3 Cowl ventilators shall be rated and labeled with the maximum effective cross-sectional area.

6.3.7.4 The cowl ventilator shall be installed over the duct to maintain the rated area in accordance with the cowl manufacturer's specifications.

6.3.7.5 Reduced airflow due to reduced area from screens shall be accounted for by using oversized cowls or ventilation openings.

6.3.7.6 If louvers are used as cowl ventilators, they shall create an airflow equivalent to that produced by the required minimum cowl ventilator size.

6.3.8 Blowers

6.3.8.1 The underway ventilation system shall be supplemented by a mechanical blower in order to remove combustible vapours from engine spaces prior to starting the engine.

6.3.8.2 Blowers may be installed with separate ducting or installed in the underway exhaust duct as illustrated in Figure 6–2.

6.3.8.3 Blowers shall be mounted as high as practicable above the bilge low point to prevent contact with bilge fluid, except for blowers designed in combination with bilge pumps, which can be operated submerged.

6.3.8.4 Blower outlet fittings shall not have less effective area than blower intakes.

6.3.8.5 Blowers shall not be wired in the ignition circuit to run continuously, unless rated by the manufacturer for continuous operation.

6.3.8.6 Blower motors shall be of a sealed type or ignition protected and shall be suitable for marine atmosphere.

6.3.8.7 A blower instruction placard shall be provided at every engine ignition switch indicating the length of blower operating time that is required to clear the engine space prior to starting the engine.

6.3.8.8 The blower shall be designed for a minimum of four minutes continuous operation, more if required, to clear any space of vapours.

6.3.8.9 Table 6–1 provides the formulae for sizing of blowers in order to achieve complete evacuation in four (4) minutes.

Table 6–1 Blower Ratings

Net Engine Space Volume [V] (m^3)	Rated Blower Capacity [Fr] (m^3/min)	Blower Output [Fo] (m^3/min)
2.83 or less	$F_r = 1.5\ V$	$F_o = 0.6\ V$
Greater than 2.83	$F_r = V/2 + 2.83$	$F_o = 0.2\ V + 1.13$

6.4 Diesel Engine and Fuel Tank Space Ventilation

6.4.1 Application

6.4.1.1 This subsection applies to any vessel, regardless of length or accommodation, that has a diesel engine for propulsion or other purposes.

6.4.2 General

6.4.2.1 Due to the characteristics of diesel fuel and the closed nature of the diesel engine fuel system, neither mechanical nor natural ventilation is necessary to remove diesel fuel vapours.

6.4.2.2 Ventilating provisions and openings to the machinery space provided for the supply of combustion air shall accommodate the air requirements as stipulated by the engine manufacturer for each propulsion and auxiliary engine in that space. These openings may also function as means of providing natural ventilation.

6.5 Battery Spaces

6.5.1 Spaces containing batteries shall provide for the escape of hydrogen.