§ 182.422 Integral and non-integral keel cooler installations.

(a) A keel cooler installation used for engine cooling must be designed to prevent flooding.

(b) Except as provided in paragraph (e), a shutoff valve must be located where the cooler piping penetrates the shell, as near the shell as practicable, except where the penetration is forward of the collision bulkhead.

(c) The thickness of the inlet and discharge connections, outboard of the shutoff valves required by paragraph (b) of this section, must be at least Schedule 80.

(d) Short lengths of approved nonmetallic flexible hose, fixed by two hose clamps at each end of the hose, may be used at machinery connections for a keel cooler installation.

(e) Shutoff valves are not required for integral keel coolers. A keel cooler is considered integral to the hull if the following conditions are satisfied:

1. The cooler structure is fabricated from material of the same thickness and quality as the hull;
2. The flexible connections are located well above the deepest subdivision draft;
3. The end of the structure is faired to the hull with a slope no greater than 4 to 1; and
4. Full penetration welds are employed in the fabrication of the structure and its attachment to the hull.


§ 182.425 Engine exhaust cooling.

(a) Except as otherwise provided in this paragraph, all engine exhaust pipes must be water cooled.

1. Vertical dry exhaust pipes are permissible if installed in compliance with §§177.405(b) and 177.970 of this chapter.

2. Horizontal dry exhaust pipes are permitted only if:
   - (i) They do not pass through living or berthing spaces;
   - (ii) They terminate above the deepest load waterline;
   - (iii) They are so arranged as to prevent entry of cold water from rough or boarding seas;
   - (iv) They are constructed of corrosion resisting material at the hull penetration; and
   - (v) They are installed in compliance with §§177.405(b) and 177.970 of this chapter.

(b) The exhaust pipe cooling water system must comply with the requirements of this paragraph.

1. Water for cooling the exhaust pipe must be obtained from the engine cooling water system or a separate engine driven pump.

2. Water for cooling the exhaust pipe, other than a vertical exhaust, must be injected into the exhaust system as near to the engine manifold as practicable. The water must pass through the entire length of the exhaust pipe.
§ 182.435 Integral fuel tanks.

(a) Gasoline fuel tanks must be independent of the hull.

(b) Diesel fuel tanks may not be built integral with the hull of a vessel unless the hull is made of:

1. Steel;
2. Aluminum; or
3. Fiber reinforced plastic when:
   
   (3) The part of the exhaust system between the point of cooling water injection and the engine manifold must be water-jacketed or effectively insulated and protected in compliance with §§ 177.405(b) and 177.970 of this chapter.

(4) Vertical exhaust pipes must be water-jacketed or suitably insulated as required by §182.430(g).

(5) When the exhaust cooling water system is separate from the engine cooling water system, a suitable warning device, visual or audible, must be installed at the operating station to indicate any reduction in normal water flow in the exhaust cooling system.

(6) A suitable hull strainer must be installed in the circulating raw water intake line for the exhaust cooling system.

(c) Engine exhaust cooling system built in accordance with the requirements of ABYC P–1 (incorporated by reference; see 46 CFR 175.600) will be considered as meeting the requirements of this section.