§ 153.372

(b) 110 percent of the cargo’s vapor pressure at the steady state temperature obtained by a full tank of cargo with the refrigeration system operating under ambient conditions described within the definition of a refrigerated tank in §153.2.

§ 153.372 Gauges and vapor return for cargo vapor pressures exceeding 100 kPa (approx. 14.7 psia).

When table 1 references this section, the containment system must have:

(a) Tank pressure gauge at the point where cargo flow is controlled during transfer; and

(b) Vapor return connection.


CARGO GAUGING SYSTEMS

§ 153.400 General requirements for gauges.

(a) Columnar gauge glasses must not be installed on a cargo containment system.

(b) Flat sight glasses must meet §38.10–20(h) of this chapter.

§ 153.404 Standards for containment systems having required closed gauges.

When Table 1 requires a cargo’s containment system to have a closed gauge, the containment system must have:

(a) A closed gauging system;

(b) A vapor return connection.


§ 153.408 Tank overflow control.

(a) When table 1 references this section, a cargo containment system must have a cargo high level alarm meeting §153.409 and one of the following additional systems:

(1) A second high level (cargo overflow) alarm.

(2) A system that automatically stops cargo flow to the tank (automatic shutdown system).

(b) The high level alarm and the cargo overflow alarm or automatic shutdown system must:

(1) Be independent of one-another; and

(2) Operate on loss of power.

(c) The cargo overflow alarm or the automatic shutdown system must operate early enough to:

(1) Stop the loading operation before the cargo tank overflows; and

(2) Avoid surge pressures that exceed the working pressure specified in §153.294(b).
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§ 153.438 Cargo pressure or temperature alarms required.

(a) Each refrigerated tank must have:
   (1) An alarm that operates when the cargo’s pressure exceeds the vapor pressure described in §153.371(b); or
   (2) An alarm that operates when the cargo’s temperature exceeds the steady

§ 153.432 Cooling systems.

(a) Each cargo cooling system must have an equivalent standby unit that is installed and that can be placed in operation immediately after failure of the primary cooling system.

§ 153.434 Heat transfer coils within a tank.

When a cargo tank contains any quantity of cargo, a cargo cooling or heating system having coils within the tank must keep the heat transfer fluid at a pressure greater than the pressure exerted on the heating or cooling system by the cargo.

§ 153.436 Heat transfer fluids: compatibility with cargo.

A heat transfer fluid separated from the cargo by only one wall (for example, the heat transfer fluid in a coil within a tank) must be compatible with the cargo under the standards prescribed for compatibility between two cargoes in Part 150 of this chapter.

§ 153.438 Cargo pressure or temperature alarms required.

(a) Each refrigerated tank must have:
   (1) An alarm that operates when the cargo’s pressure exceeds the vapor pressure described in §153.371(b); or
   (2) An alarm that operates when the cargo’s temperature exceeds the steady

§ 153.409 High level alarms.

When Table 1 refers to this section or requires a cargo to have a closed gauging system, the cargo’s containment system must have a high level alarm:

(a) That gives an audible and visual alarm before the tank fills to 97 percent of its capacity;

(b) That can be seen and heard where cargo transfer is controlled and on the open deck;

(c) Whose operation can be checked prior to each loading; and

(d) That must be marked as described in §153.408(c)(6) with the legend “HIGH LEVEL ALARM.”


§ 153.430 Heat transfer systems; general.

Each cargo cooling system required by this part and each cargo heating system must:

(a) Meet the standards of Subchapters F (Marine Engineering) and J (Electrical Engineering) of this chapter;