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(1) A refrigeration system that keeps the tank pressure below the safety relief valve operating pressure when ambient temperatures are 46°C (115°F) air and 32°C (90°F) water.

(2) A relief valve or pressure control valve that maintains the tank pressure below the setting of the tank's required safety relief valve in ambient temperatures of 46°C (115°F) air and 32°C (90°F) water.

(b) A cargo tank with a maximum allowable working pressure of less than 172 kPa (25 psig) is approved by the Commandant (G–MSO) on a case by case basis.

(c) Section 151.50–30 also applies to the carriage of argon or nitrogen.

[CGD 88–100, 54 FR 40040, Sept. 29, 1989]

§ 151.50–40 Additional requirements for carbon disulfide (carbon bisulfide) and ethyl ether.

(a) The provisions of this section are applicable if specifically referenced in the Special Requirements column of Table 151.05.

(b) Cargo tanks shall be electrically bonded to the hull of the vessel. A vessel shall be electrically bonded to the shore piping prior to connecting the cargo hose. This electrical bonding shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

(c) Pumps may be used for discharging cargo: *Provided,* That they are the vertical submerged type designed to avoid liquid pressure against the shaft gland and are suitable for use with the cargo.

(d) Provisions shall be made to maintain an inert gas padding in the cargo tank during loading, unloading and during transit.

(e) Provisions shall be made to prevent any leakage being washed into the waterways at the loading and unloading points.

(f) The special requirements of § 151.50–41 for carbon disulfide (*carbon bisulfide*) and § 151.50–42 for ethyl ether shall also be observed.

[CFGR 70–10, 35 FR 3714, Feb. 25, 1970, as amended by CGD 88–100, 54 FR 40029, Sept. 29, 1989]

§ 151.50–41 Carbon disulfide (carbon bisulfide).

(a) All openings shall be in the top of the tank.

(b) Loading lines shall terminate near the bottom of the tank.

(c) A standard ullage opening shall be provided for secondary and emergency sounding.

(d) If a cargo discharge pump is used, it shall be inserted through a cylindrical well extending from the tank top to a point near the tank bottom. A blanket of water shall be formed in this well before attempting pump removal.

(e) Water or inert gas displacement may be used for discharging cargo provided the cargo system is designed for the expected pressure and temperature. This method for discharging may be used with pressure type tanks only.

(f) Adequate natural ventilation shall be provided for the voids around the cargo tanks while the vessel is under way. During loading and unloading, forced ventilation shall be used. The forced ventilation shall be of sufficient capacity to provide a complete change of air within each void space every 5 minutes. The ventilating fan shall be of nonsparking construction.

(g) Because of its low ignition temperature and the close clearances required to arrest its flame propagation, carbon disulfide (*carbon bisulfide*) requires safeguards beyond those required for any electrical hazard groups.

(h) The requirements of § 151.50–40 are also applicable to the shipment of carbon disulfide (*carbon bisulfide*).

[CFGR 70–10, 35 FR 3714, Feb. 25, 1970, as amended by CGD 88–100, 54 FR 40040, Sept. 29, 1989]

§ 151.50–42 Ethyl ether.

(a)(1) Gravity tanks shall be designed and tested to meet the rules of the American Bureau of Shipping for a head of water at least 8 feet above the tank top or the highest level the lading may rise, whichever is greater. All openings shall be in the top of the tank.

(2) Pressure vessel type tanks shall be designed for the maximum pressure to which they may be subjected when pressure is used to discharge the cargo, but in no case shall the design pressure be less than 50 pounds per square inch

gauge. All openings shall be in the top of the tank.

(b) Adequate natural ventilation shall be provided for the voids around the cargo tanks while the vessel is underway. If a power ventilation system is installed, all blowers shall be of nonsparking construction. Power driven ventilation equipment shall not be located in the void spaces surrounding the cargo tanks.

(c) Pressure relief valve settings shall not be less than 3 pounds per square inch gauge for gravity tanks. For pressure vessels, the relief valve setting shall not exceed the design pressure of the tank.

(d) Inert gas displacement may be used for discharging cargo from pressure vessel tanks provided the cargo system is designed for the expected pressure and the discharge pressure does not exceed 50 pounds per square inch gauge or the design pressure of the tank, whichever is less.

(e) No electrical equipment except for approved lighting fixtures shall be installed in enclosed spaces adjacent to the cargo tanks. Lighting fixtures must be approved for use in Class I, Group C, hazardous locations. The installation of electrical equipment on the weather deck shall comply with the requirements of part 111, subpart 111.105 of this chapter.

(f) Copper, silver, mercury and magnesium or other acetylide forming metals and their alloys shall not be used as materials of construction for tanks, pipelines, valves, fittings and other items of equipment that may come in contact with the cargo vapor or liquid.

(g) Precautions shall be taken to prevent the contamination of ethyl ether by strong oxidizing agents.

(h) The requirements of § 151.50–40 are also applicable to the shipment of ethyl ether.

[CFGR 70–10, 35 FR 3714, Feb. 25, 1970, as amended by CGD 88–100, 54 FR 40040, Sept. 29, 1989]

§ 151.50–50 Elemental phosphorus in water.

(a) Tanks shall be designed and tested for a head equivalent to the design lading of phosphorus and its water blanket extended to 8 feet above the tank top. In addition, tank design calculations shall demonstrate that the tank can withstand, without rupture, a single loading to the highest level to which the water blanket may rise, if that exceeds 8 feet. Tanks shall not be less than 5/16-inch thick.

(b) When a water displacement method of discharge is used, pressure vessel type cargo tanks, designed and tested in accordance with Subchapter F of this chapter shall be employed. Such tanks shall be designed for the maximum pressure to which they may be subjected when water pressure is used to discharge the cargo.

(c) Each cargo tank shall be fitted with an approved pressure vacuum relief valve set to discharge at a pressure not exceeding 2 pounds per square inch. When transferring cargo, the vent discharge shall lead overboard above the waterline. When pressure vessel type tanks are used, each tank shall be fitted with a relief valve of suitable size.

(d) Sufficient outage shall be provided to prevent the tank from being liquid full at any time, but in no case shall the outage be less than 1 percent. When pressure vessel type tanks are used, outage need not be provided.

(e) The use of compressed air to discharge cargo is prohibited.

(f) Cargo shall be loaded at a temperature not exceeding 140°F., and then cooled until the water above the cargo has a temperature not exceeding 105°F. prior to the movement of the vessel. Upon presentation of satisfactory proof that procedures followed will provide adequate safety in transportation and handling, the Commandant may authorize movement of the vessel following cooling of the water above the cargo to a temperature exceeding 105°F.

(g) Coils in which steam or hot water is circulated to heat the cargo so that it may be pumped shall be located outside the cargo tanks.

(h) A fixed ballast piping system (including a power driven pump of ample capacity), or other means acceptable to the Commandant shall be installed so that any void space surrounding the tanks may be flooded.

(i) All openings shall be in the top of the tank and shall be fitted with bolted