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raised-face type, fitted with suitable gasket material. Welded fittings shall be used wherever possible and the number of pipe joints shall be held to a minimum. Threaded joints are not permitted for pipe diameters exceeding 2 inches. Brazed joints are prohibited.

(c) Each cargo tank shall be electrically grounded to the hull.

(d) The 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.

(e) To the extent he deems it necessary, the Officer in Charge, Marine Inspection, may require that sufficient insulation shall be removed from insulated tanks at least once in each 8 calendar years to permit spot external examination of the tanks and insulation in accordance with §151.04–5(c).

(f) The requirements of §151.50–30 for compressed gases are also applicable to the shipment of vinyl chloride.

(g) The person in charge of cargo transfer shall ensure that:

(1) Cargo vapors are returned to the cargo tank or shore disposition for reclamation or destruction during cargo transfer operations;

(2) Continuous monitoring for vinyl chloride vapor leaks is conducted aboard a tank barge undergoing vinyl chloride transfer operations. Fixed or portable instrumentation may be utilized to ensure that personnel are not exposed to vinyl chloride vapor concentrations in excess of 1 ppm averaged over any eight hour period of 5 ppm averaged over any period not exceeding 15 minutes. The method of monitoring and measurement shall have an accuracy (with a confidence level of 95 percent) of not less than plus or minus 50 percent from 0.25 through 0.5 ppm, plus or minus 35 percent from over 0.5 ppm through 1.0 ppm, and plus or minus 25 percent over 1.0 ppm;

(3) Cargo transfer operation is discontinued or corrective action is initiated by the person in charge to minimize exposure to personnel whenever a vinyl chloride vapor concentration in excess of 1 ppm is detected. If the vinyl chloride vapor concentration exceeds 5 ppm for over 15 minutes, action to reduce the leak can be continued only if the respiratory protection requirements of 29 CFR 1910.1017 are met by all personnel in the area of the leak;

(4) Those portions of cargo lines which will be open to the atmosphere after piping is disconnected are free of vinyl chloride liquid and that the vinyl chloride vapor concentration in the area of the cargo piping disconnect points is not greater than 5 ppm;

(5) Any restricted gauge fitted on a tank containing vinyl chloride is effectively out of service by locking or sealing the device so that it cannot be used; and

(6) A restricted gauge is not to be used as a ''check'' on the required closed gauge, nor as a means or sampling.

(h) The words ''CANCER—SUSPECT AGENT'' must be added to the warning signs required by 46 CFR 151.45–2(e).

(i) Signs bearing the legend:

CANCER—SUSPECT AGENT IN THIS AREA

PROTECTIVE EQUIPMENT REQUIRED

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must be posted whenever hazardous operations, such as tank cleaning, are in progress.

(j) A tank barge undergoing cargo transfer operations must be designated a ''regulated area'' having access limited to authorized persons and requiring a daily roster of authorized persons who may board the barge.

(k) Employees engaged in hazardous operations, such as tank cleaning, must be provided, and be required to wear and use respiratory protection in accordance with the provisions of 29 CFR 1910.1017 and protective garments, provided clean and dry for each use, to prevent skin contact with liquid vinyl chloride.

[CGFR 70–10, 35 FR 3714, Feb. 25, 1970, as amended by CGD 74–167R, 40 FR 17026, Apr. 16, 1975; CGD 88–100, 54 FR 40040, Sept. 29, 1989]

§151.50–36 Argon or nitrogen.

(a) A cargo tank that contains argon or nitrogen and that has a maximum allowable working pressure of 172 kPa (25 psig) or greater must have one of the following arrangements:

(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