

*Accidents Involving Dangerous Goods*, printed by IMO, London, U.K.

**§ 154.1440 Antidotes.**

Each vessel must have the antidotes prescribed in the *IMO Medical First Aid Guide for Use in Accidents Involving Dangerous Goods*, printed by IMO, London, U.K. for the cargoes being carried.

**Subpart D—Special Design and Operating Requirements**

**§ 154.1700 Purpose.**

This subpart prescribes design and operating requirements that are unique for certain cargoes regulated by this part.

**§ 154.1702 Materials of construction.**

When Table 4 references one of the following paragraphs in this section, the materials in the referenced paragraph must not be in components that contact the cargo liquid or vapor:

- (a) Aluminum and aluminum bearing alloys.
- (b) Copper and copper bearing alloys.
- (c) Zinc or galvanized steel.
- (d) Magnesium.
- (e) Mercury.
- (f) Acetylide forming materials, such as copper, silver, and mercury.

**§ 154.1705 Independent tank type C.**

The following cargoes must be carried in an independent tank type C that meets §154.701(a):

- (a) Ethylene oxide.
- (b) Methyl bromide.
- (c) Sulfur dioxide.

**§ 154.1710 Exclusion of air from cargo tank vapor spaces.**

When a vessel is carrying acetaldehyde, butadiene, ethylene oxide, or vinyl chloride, the master shall ensure that air is:

- (a) Purged from the cargo tanks and associated piping before the cargo is loaded; and
- (b) Excluded after the cargo is loaded by maintaining a positive pressure of at least 13.8 kPa gauge (2 psig) by:
  - (1) Introducing a gas that:
    - (i) Is not reactive;
    - (ii) Is not flammable; and
    - (iii) Does not contain more than 0.2% oxygen by volume; or

- (2) Controlling the cargo temperature.

**§ 154.1715 Moisture control.**

When a vessel is carrying sulfur dioxide, the master shall ensure that:

- (a) A cargo tank is dry before it is loaded with sulfur dioxide; and
- (b) Air or inert gas admitted into a cargo tank carrying sulfur dioxide during discharging or tank breathing has a moisture content equal to or less than the moisture content of air with a dew-point of  $-45^{\circ}\text{C}$  ( $-49^{\circ}\text{F}$ ) at atmospheric pressure.

**§ 154.1720 Indirect refrigeration.**

A refrigeration system that is used to cool acetaldehyde, ethylene oxide, or methyl bromide, must be an indirect refrigeration system that does not use vapor compression.

**§ 154.1725 Ethylene oxide.**

(a) A vessel carrying ethylene oxide must:

- (1) Have cargo piping, vent piping, and refrigeration equipment that have no connections to other systems;
- (2) Have valves, flanges, fittings, and accessory equipment made of steel, stainless steel, except types 416 and 442, or other material specially approved by the Commandant (G-MSO);
- (3) Have valve disk faces, and other wearing parts of valves made of stainless steel containing not less than 11% chromium;
- (4) Have gaskets constructed of spirally wound stainless steel with teflon or other material specially approved by the Commandant (G-MSO);
- (5) Not have asbestos, rubber, or cast iron components in the cargo containment system and piping;
- (6) Not have threaded joints in cargo piping;
- (7) Have a water spray system under §154.1105 that protects the above deck cargo piping; and
- (8) Have a nitrogen inerting system or on board nitrogen gas storage that can inert the vapor space of an ethylene oxide cargo tank for a period of 30 days under the condition of paragraph (e) of this section.
  - (b) Cargo hose used for ethylene oxide must: