

pressure requirements for the pressure relief valves must be as specified in § 179.401-1 of this subchapter. The alternate pressure relief device values specified in § 179.401-1 of this subchapter for a DOT-113C120W tank car apply to a DOT-113D120W tank car.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53, app. A to part 1)

[Amdt. 173-166, 48 FR 27698, June 16, 1983, as amended by Amdt. 173-245, Sept. 21, 1995; 65 FR 58630, Sept. 29, 2000; 66 FR 45184, 45379, 45383, Aug. 28, 2001]

§ 173.320 Cryogenic liquids; exceptions.

(a) Atmospheric gases and helium, cryogenic liquids, in Dewar flasks, insulated cylinders, insulated portable tanks, insulated cargo tanks, and insulated tank cars, designed and constructed so that the pressure in such packagings will not exceed 25.3 psig under ambient temperature conditions during transportation are not subject to the requirements of this subchapter when transported by motor vehicle or railcar except as specified in paragraphs (a)(1), (a)(2), and (a)(3) of this section.

(1) Sections 171.15 and 171.16 of this subchapter pertaining to the reporting of incidents, not including a release that is the result of venting through a pressure control valve, or the neck of the Dewar flask.

(2) Subparts A, B, C, and D of part 172, (§§ 174.24 for rail and 177.817 for highway) and in addition, part 172 in its entirety for oxygen.

(3) Subparts A and B of part 173, and §§ 174.1 and 177.800, 177.804, and 177.823 of this subchapter.

(b) The requirements of this subchapter do not apply to atmospheric gases and helium:

(1) During loading and unloading operations (pressure rises may exceed 25.3 psig); or

(2) When used in operation of a process system; such as a refrigeration system (pressure may exceed 25.3 psig).

(c) For transportation aboard aircraft, see the ICAO Technical Instructions, Packing Instruction 202 and the packaging specifications in part 6, Chapter 5. (See § 171.7 of this sub-

chapter for ICAO Technical Instructions.)

[Amdt. 173-201, 52 FR 13043, Apr. 20, 1987, as amended at 62 FR 51561, Oct. 1, 1997; 66 FR 33436, June 21, 2001; 67 FR 61014, Sept. 27, 2002]

§ 173.321 Ethylamine.

Ethylamine must be packaged as follows:

(a) In 1A1 drums which meet Packing Group I performance level requirements.

(b) In specification cylinders as prescribed for any compressed gas except acetylene.

[Amdt. 173-224, 55 FR 52667, Dec. 21, 1990]

§ 173.322 Ethyl chloride.

Ethyl chloride must be packaged in any of the following single or combination non-bulk packagings which meet Packing Group I performance level requirements:

(a) In 4C1, 4C2, 4D or 4F wooden boxes with glass, earthenware, or metal inner receptacles not over 500 g (17.6 ounces) capacity each;

(b) In 4G fiberboard boxes with glass, earthenware, or metal inner receptacles not over 500 g (17.6 ounces) capacity each. Outer packagings may not exceed 30 kg (66 pounds) gross weight;

(c) In 1A1 drums of not over 100 L (26 gallons) capacity each; or

(d) In specification cylinders as prescribed for any compressed gas except acetylene.

[Amdt. 173-224, 55 FR 52667, Dec. 21, 1990]

§ 173.323 Ethylene oxide.

(a) For packaging ethylene oxide in non-bulk packagings, silver mercury or any of its alloys or copper may not be used in any part of a packaging, valve, or other packaging appurtenance if that part, during normal conditions of transportation, may come in contact with ethylene oxide liquid or vapor. Copper alloys may be used only where gas mixtures do not contain free acetylene at any concentration that will form copper acetylene. All packaging and gaskets must be constructed of materials which are compatible with ethylene oxide and do not lower the auto-ignition temperature of ethylene oxide.

(b) Ethylene oxide must be packaged in one of the following:

(1) In 4G fiberboard boxes with inner glass ampoules or vials. Total quantity of ethylene oxide may not exceed 100 grams (3.5 ounces) per package. The completed package must be capable of passing Packing Group I performance tests.

(2) In 4G fiberboard boxes constructed with top and bottom pads and perimeter liner. Inner packagings must be aluminum receptacles of no more than 135 g (4.8 ounces) capacity cushioned with incombustible material. No more than 12 receptacles may be packed in one box, and no more than 10 boxes may be overpacked under the provisions of §173.25 of this part. Each completed package must be capable of passing Packing Group I performance tests.

(3) In 4C1, 4C2, 4D or 4F wooden boxes or 4G fiberboard boxes with inner metal receptacles of no more than 340 g (12 ounces) capacity. The metal receptacle must be capable of withstanding no less than a 1241.1 kPa (180 psig) burst pressure. No more than 12 receptacles may be packed in one box, and each receptacle may not be liquid full below 82 °C (180 °F). Each inner receptacle must be insulated and equipped with a relief device of the fusible plug type with yield temperature of 69 °C to 77 °C (156 °F to 171 °F). The capacity of relief device and insulation must be such that the charged receptacle will not explode when tested by the method described in CGA Pamphlet C-14 or other equivalent method. Each completed package must be capable of passing all Packing Group I performance tests.

(4) In specification cylinders, as authorized for any compressed gas except acetylene. Pressurizing valves and insulation are required for cylinders over 4 L (1 gallon) capacity. Eductor tubes must be provided for cylinders over 19 L (5 gallons) capacity. Cylinders must be seamless or welded steel (not brazed) with a nominal capacity of no more than 115 L (30 gallons) and may not be liquid full below 82 °C (180 °F). Before each refilling, each cylinder must be tested for leakage at no less than 103.4 kPa (15 psig) pressure. In addition, each cylinder must be equipped

with a fusible type relief device with yield temperature of 69 °C to 77 °C (157 °F to 170 °F). The capacity of the relief device and the effectiveness of the insulation must be such that the charged cylinder will not explode when tested by the method described in CGA Pamphlet C-14 or other equivalent method.

(5) In 1A1 steel drums of no more than 231 L (61 gallons) and meeting Packing Group I performance standards. The drum must be lagged, of all welded construction with the inner shell having a minimum thickness of 1.7 mm (0.068 inches) and the outer shell having a minimum thickness of 2.4 mm (0.095 inches). Drums must be capable of withstanding a hydrostatic test pressure of 690 kPa (100 psig). Lagging must be of sufficient thickness so that the drum, when filled with ethylene oxide and equipped with the required pressure relief device, will not rupture when exposed to fire. The drum may not be liquid full below 85 °C (185 °F), and must be marked "THIS END UP" on the top head. Before each refilling, each drum must be tested for leakage at no less than 103 kPa (15 psig) pressure. Each drum must be equipped with a fusible type relief device with yield temperature of 69 °C to 77 °C (157 °F to 170 °F), and the capacity of the relief device must be such that the filled drum is capable of passing, without rupture, the test method described in CGA Pamphlet C-14 or other equivalent method.

(c) When §172.101 of this subchapter specifies that a hazardous material be packaged under this section, only the following bulk packagings are authorized, subject to the requirements of subparts A and B of this part, the special provisions specified in column 7 of the §172.101 table, and paragraphs (d) through (j) of this section:

(1) *Tank cars.* Class DOT 105J tank cars: Notwithstanding the requirements of §173.31(c), each tank car must have a tank test pressure of at least 20.7 Bar (300 psig) no later than July 1, 2006.

(2) *Cargo tanks.* Specification MC 330 and MC 331 cargo tank motor vehicles.

(3) *Portable tanks.* DOT 51 portable tanks.

(d) The pressure relief devices must be set to function at 517 kPa (75 psig).

Portable tanks fitted with non-reclosing devices made and in use prior to December 31, 1987, may continue to be used in ethylene oxide service.

(e) In determining outage, consideration must be given to the lading temperature and solubility of inert gas padding in ethylene oxide as well as the partial pressure exerted by the gas padding.

(f) Each tank, loaded or empty, must be padded with dry nitrogen or other suitable inert gas of sufficient quantity to render the vapor space of the tank nonflammable up to 41 °C (105 °F). The gas used for padding must be free of impurities which may cause the ethylene oxide to polymerize, decompose or undergo other violent chemical reaction.

(g) Copper, silver, mercury, magnesium or their alloys may not be used in any part of the tank or appurtenances that are normally in contact with the lading.

(h) Neoprene, natural rubber and asbestos gaskets are prohibited. All packing and gaskets must be made of materials which do not react with or lower the autoignition temperature of the lading.

(i) Each tank must be insulated with cork (at least 10 cm (4 inches) thick), or mineral wool, fiberglass or other suitable insulation material of sufficient thickness so that the thermal conductance at 16 °C (60 °F) is not more than 0.075 Btu per hour per square foot per degree F. temperature differential. Portable tanks made and in use prior to December 31, 1987 equipped with fusible plugs instead of a pressure relief valve or rupture disc, must have sufficient insulation so that the tank as filled for shipment will not rupture in a fire. The insulation on portable tanks or cargo tank motor vehicles must be protected with a steel jacket at least 2.54 mm (0.100 inch) thick, or as required by the specification.

(j) Tank car tanks built after December 30, 1971 must be equipped with a thermometer well.

[Amdt. 173-224, 55 FR 52667, Dec. 21, 1990, as amended at 56 FR 66279, Dec. 20, 1991; Amdt. 173-236, 58 FR 50237, Sept. 24, 1993; Amdt. 173-234, 58 FR 51532, Oct. 1, 1993; Amdt. 173-145, 60 FR 49076, Sept. 21, 1995; 66 FR 45380, 45383, Aug. 28, 2001]

§ 173.334 Organic phosphates mixed with compressed gas.

Hexaethyl tetraphosphate, parathion, tetraethyl dithio pyrophosphate, tetraethyl pyrophosphate, or other Division 6.1 organic phosphates (including a compound or mixture), may be mixed with a non-flammable compressed gas. This mixture may not contain more than 20 percent by weight of organic phosphate and must be packaged in DOT 3A240, 3AA240, 3B240, 4A240, 4B240, 4BA240, or 4BW240 cylinders meeting all of the following requirements:

(a) Each cylinder may be filled with not more than 5 kg (11.0 lb) of the mixture, to a maximum filling density of not more than 80 percent of the water capacity.

(b) No cylinder may be equipped with an education tube or a fusible plug.

(c) No cylinder may be equipped with any valve unless the valve is a type approved by the Associate Administrator.

(d) Cylinders must be overpacked in a box, crate, or other strong outside packaging conforming to the requirements of §173.25 and arranged to protect each valve or other closing device from damage. Except as provided in paragraph (e) of this section, no more than four cylinders may be packed in a strong outside packaging. Each strong outside packaging with its closing device protection must be sufficiently strong to protect all parts of each cylinder from deformation or leakage if the completed package is dropped 1.8 m (6 feet) onto a non-yielding surface, such as concrete or steel, impacting at the packaging's weakest point.

(e) Cylinders may be packed in strong wooden boxes with valves or other closing devices protected from damage, with not more than twelve cylinders in one outside wooden box. An outer fiberboard box may be used when not more than four such cylinders are to be shipped in one packaging. Valves must be adequately protected. Box and valve protection must be of sufficient strength to protect all parts of inner packagings and valves from deformation or breakage resulting from a drop of at least 1.8 m (6 feet) onto a non-yielding surface, such as concrete or steel, impacting at the weakest point.

[67 FR 51651, Aug. 8, 2002]