

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 105 tank cars:

(i) Each tank car built before March 16, 2009 must have a tank test pressure of at least 20.7 Bar (300 psig); and

(ii) Except as provided in §173.314(d), tank cars built on or after March 16, 2009 used for the transportation of ethylene oxide must meet the applicable authorized tank car specification listed in the table in §173.314(c).

(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; 68 FR 75746, Dec. 31, 2003; 69 FR 76178, Dec. 20, 2004; 71 FR 33884, June 12, 2006; 74 FR 1801, Jan. 13, 2009]

#### § 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, 4B240, 4BA240, 4BW240 or UN 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 outer 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 outer packaging. Each strong outer 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, as amended at 71 FR 54395, Sept. 14, 2006; 75 FR 5395, Feb. 2, 2010]

**§ 173.335 Chemical under pressure n.o.s.**

(a) *General requirements.* A cylinder filled with a chemical under pressure must be offered for transportation in accordance with the requirements of this section and §172.301. In addition, a DOT specification cylinder must meet the requirements in §§173.301a, 173.302, 173.302a, and 173.305, as applicable. UN pressure receptacles must meet the requirements in §§173.301b and 173.302b, as applicable. Where more than one section applies to a cylinder, the most re-

strictive requirements must be followed.

(b) *Filling limits.* Cylinders must be filled so that at 50 °C (122 °F) the non-gaseous phase does not exceed 95% of their water capacity and they are not completely filled at 60 °C (140 °F). When filled, the internal pressure at 65 °C (149 °F) must not exceed the test pressure of the cylinder. The vapor pressures and volumetric expansion of all substances in the cylinders must be taken into account.

(c) *Minimum service pressure.* The minimum service pressure must be in accordance with the design specifications of part 178 of this subchapter for the propellant. In any case the minimum test pressure must not be less than 20 bar.

(d) *Periodic inspection.* The maximum requalification test period for cylinders transporting chemical under pressure n.o.s. is 5 years.

[78 FR 1092, Jan. 7, 2013]

**§ 173.336 Nitrogen dioxide, liquefied, or dinitrogen tetroxide, liquefied.**

(a) Nitrogen dioxide, liquefied, or dinitrogen tetroxide, liquefied, must be packaged in specification or UN cylinders as prescribed in §173.192, except valves are not authorized. UN tubes and MEGCs are not authorized for use. Cylinders must be equipped with a stainless steel valve and valve seat that will not deteriorate in contact with nitrogen dioxide. Each valve opening must be closed by a solid metal plug with tapered thread properly luted to prevent leakage. Transportation in DOT 3AL cylinders is authorized only by highway and rail.

(b) Each UN pressure receptacle must be cleaned in accordance with the requirements of ISO 11621 (IBR, see §171.7 of this subchapter). Each DOT specification cylinder must be cleaned according to the requirements of GSA Federal Specification RR-C-901D, paragraphs 3.3.1 and 3.3.2 (IBR, see §171.7 of this subchapter). Cleaning agents equivalent to those specified in RR-C-901D may be used; however, any cleaning agent must not be capable of reacting with oxygen. One cylinder selected at random from a group of 200 or fewer and cleaned at the same time must be