TABLE 1—REQUALIFICATION INTERVALS OF UN PRESSURE RECEPTACLES—Continued

Interval (years)	UN pressure receptacles/hazardous materials
	UN1043, Fertilizer ammoniating solution with free ammonia. UN1051, Hydrogen cyanide, stabilized containing less than 3% water. UN1052, Hydrogen fluoride, anhydrous. UN1745, Bromine pentafluoride. UN1746, Bromine trifluoride. UN2073, Ammonia solution. UN2495, Iodine pentafluoride. UN2983, Ethylene Oxide and Propylene oxide mixture, not more than 30% ethylene oxide.
5	Pressure receptacles used for adsorbed gases.

(d) *Requalification procedures*. Each UN pressure receptacle must be requalified in conformance with the procedures contained in the following standards, as applicable. Furthermore, when a pressure test is performed on a UN pressure receptacle, the test must be a water jacket volumetric expansion test suitable for the determination of the cylinder expansion or a hydraulic proof pressure test. The test equipment must conform to the accuracy requirements in §180.205(g). Alternative methods (*e.g.*, acoustic emission) or requalification procedures may be performed if prior approval has been obtained in writing from the Associate Administrator.

(1) *Seamless steel:* Each seamless steel UN pressure receptacle, including pressure receptacles exceeding 150 L capacity installed in MEGCs or in other service, must be requalified in accordance with ISO 6406:2005(E) (IBR, see § 171.7 of this subchapter). However, UN cylinders with a tensile strength greater than or equal to 950 MPa must be requalified by ultrasonic examination in accordance with ISO 6406:2005(E). For seamless steel cylinders and tubes, the internal inspection and hydraulic pressure test may be replaced by a procedure conforming to ISO 16148:2016(E) (IBR, see §171.1).

(2) Seamless UN aluminum: Each seamless aluminum UN pressure receptacle must be requalified in accordance with ISO 10461 (IBR, see §171.7 of this subchapter).

(3) Dissolved acetylene UN cylinders: Each dissolved acetylene cylinder must be requalified in accordance with ISO 10462:2013(E) (IBR, *see* §171.7 of this subchapter). A cylinder previously requalified in accordance with the second edition of ISO 10462(E) up until December 31, 2018, may continue to be used until the next required requalification. The porous mass and the shell must be requalified no sooner than 3 years, 6 months, from the date of manufacture. Thereafter, subsequent requalifications of the porous mass and shell must be performed at least once every ten years.

(4) Composite UN cylinders: Each composite cylinder must be inspected and tested in accordance with ISO 11623:2015(E) (IBR, *see* §171.7 of this subchapter). Until December 31, 2020, ISO 11623:2002(E) (IBR, *see* §171.7 of this subchapter) may be used.

(5) UN cylinders for adsorbed gases: Each UN cylinder for adsorbed gases must be inspected and tested in accordance with §173.302c and ISO 11513:2011 (IBR, see §171.7 of this subchapter).

(6) Valves: Inspection and maintenance of cylinder valves must be carried out in accordance with ISO 22434:2006 Transportable gas cylinders—Inspection and maintenance of cylinder valves (IBR, *see* §171.7 of this subchapter).

(7) UN cylinder bundles: UN cylinder bundles containing compressed, liquefied, and dissolved gas must be inspected and tested in accordance with ISO 20475:2018(E) (IBR, *see* §171.7 of this subchapter).

[71 FR 33894, June 12, 2006, as amended at 71 FR 54397, Sept. 14, 2006; 76 FR 3389, Jan. 19, 2011; 80 FR 1168, Jan. 8, 2015; 82 FR 15897, Mar. 30, 2017; 85 FR 27901, May 11, 2020; 85 FR 85434, Dec. 28, 2020; 86 FR 45000, July 26, 2022]

§ 180.209 Requirements for requalification of specification cylinders.

(a) *Periodic qualification of cylinders*. Each specification cylinder that becomes due for periodic requalification, as specified in the following table,

must be requalified and marked in conformance with the requirements of this subpart. Requalification records must be maintained in accordance with §180.215. Table 1 follows:

TABLE 1 TO PARAGRAPH (a) —REQUALIFICATION OF CYLINDERS [1]

Specification under which cylinder was made	Minimum test pressure (psig) [2]	Requalification period (years)
3	3000 psig	5.
3A, 3AA	5/3 times service pressure, except non-corrosive service (*see* §180.209(g)).	5, 10, or 12 (*see* §180.209(b), (f), (h), and (j)).
3AL	5/3 times service pressure	5 or 12 (see §180.209(j) and(m) [3]).
3AX, 3AAX	5/3 times service pressure	5.
3B, 3BN	2 times service pressure (*see* §180.209(g)).	5 or 10 (see §180.209(f)).
3E	Test not required.	
3HT	5/3 times service pressure	3 (*see* §§180.209(k) and 180.213(c)).
3T	5/3 times service pressure	5.
4AA480	2 times service pressure (*see* §180.209(g)).	5 or 10 (*see* §180.209(h)).
4B, 4BA, 4BW, 4B–240ET	2 times service pressure, except non-corrosive service (*see* §180.209(g)).	5, 7, 10, or 12 (*see* §180.209(e), (f), and (j)).
4D, 4DA, 4DS	2 times service pressure	5.
4E	2 times service pressure, except non-corrosive service (*see* §180.209(g)).	5, 10, or 12 (*see* §180.209(e)).
4L	Test not required.	
8, 8AL		10 or 20 (*see* §180.209(i)).
Exemption or special permit cylinder	See current exemption or special permit	See current exemption or special permit.
Foreign cylinder (*see* §173.301(j) of this subchapter for restrictions on use).	As marked on cylinder, but not less than 5/3 of any service or working pressure marking.	5 (*see* §§180.209(l) and 180.213(d)(2)).

[1] Any cylinder not exceeding 2 inches outside diameter and less than 2 feet in length is excepted from volumetric expansion test.
[2] For cylinders not marked with a service pressure, see §173.301a(b) of this subchapter.
[3] This provision does not apply to cylinders used for carbon dioxide, fire extinguisher, or other industrial gas service.

(b) *DOT 3A or 3AA cylinders.* (1) A cylinder conforming to specification DOT 3A or 3AA with a water capacity of 56.7 kg (125 lb) or less that is removed from any cluster, bank, group, rack, or vehicle each time it is filled, may be requalified every ten years instead of every five years, provided the cylinder conforms to all of the following conditions:

(i) The cylinder was manufactured after December 31, 1945.

(ii) The cylinder is used exclusively for air; argon; cyclopropane; ethylene; helium; hydrogen; krypton; neon; nitrogen; nitrous oxide; oxygen; sulfur hexafluoride; xenon; chlorinated hydrocarbons, fluorinated hydrocarbons, liquefied hydrocarbons, and mixtures thereof that are commercially free from corroding components; permitted mixtures of these gases (*see* §173.301(d) of this subchapter); and permitted mixtures of these gases with up to 30 percent by volume of carbon dioxide, provided the gas has a dew point at or below minus (52 °F) at 1 atmosphere.

(iii) [Reserved]

(iv) The cylinder is dried immediately after hydrostatic testing to remove all traces of water.

(v) The cylinder is not used for underwater breathing.

(vi) Each cylinder is stamped with a five-pointed star at least one-fourth of an inch high immediately following the test date.

(2) If, since the last required requalification, a cylinder has not been used exclusively for the gases specifically identified in paragraph (b)(1)(ii) of this section, but currently conforms with all other provisions of paragraph (b)(1) of this section, it may be requalified every 10 years instead of every five years, provided it is first requalified and examined as prescribed by §173.302a(b) (2), (3) and (4) of this subchapter.

(3) Except as specified in paragraph (b)(2) of this section, if a cylinder, marked with a star, is filled with a compressed gas other than as specified in paragraph (b)(1)(ii) of this section, the star following the most recent test date must be obliterated. The cylinder

must be requalified five years from the marked test date, or prior to the first filling with a compressed gas, if the required five-year requalification period has passed.

(c) *DOT 4-series cylinders.* A DOT 4-series cylinder, except a 4L cylinder, that at any time shows evidence of a leak, internal or external corrosion, denting, bulging or rough usage to the extent that it is likely to be weakened appreciably, or that has lost 5 percent or more of its official tare weight must be requalified before being refilled and offered for transportation. (Refer to CGA C–6 or C–6.3 (IBR, see §171.7 of this subchapter), as applicable, regarding cylinder weakening.) After testing, the actual tare weight must be recorded as the new tare weight on the test report and marked on the cylinder. The previous tare weight must be strike-lined through, but not obliterated.

(d) *Cylinders 5.44 kg (12 lb) or less with service pressures of 300 psig or less.* A cylinder of 5.44 (12 lb) or less water capacity authorized for service pressure of 300 psig or less must be given a complete external visual inspection at the time periodic requalification becomes due. External visual inspection must be in accordance with CGA Pamphlet C–6 or C–6.1 (IBR, see §171.7 of this subchapter). The cylinder may be proof pressure tested. The test is successful if the cylinder, when examined under test pressure, does not display a defect described in §180.205(i)(1) (ii) or (iii). Upon successful completion of the test and inspection, the cylinder must be marked in accordance with §180.213.

(e) *Cylinders in non-corrosive gas service.* A cylinder made in conformance with DOT Specifications 4B, 4BA, 4BW, or 4E protected externally by a suitable corrosion-resistant coating and used exclusively for non-corrosive gas that is commercially free from corroding components may be requalified by volumetric expansion testing every 12 years instead of every 5 years. As an alternative, the cylinder may be subjected to a proof pressure test at least two times the marked service pressure, but this latter type of test must be repeated every 10 years after expiration of the initial 12-year period. When subjected to a proof pressure test, as prescribed in CGA C–1 (IBR, see §171.7 of this subchapter), the cylinder must be carefully examined under test pressure and removed from service if a leak or defect is found.

(f) *Poisonous materials.* A cylinder conforming to specification DOT 3A, 3AA, 3B, 4BA, or 4BW having a service pressure of 300 psig or less and used exclusively for methyl bromide, liquid; mixtures of methyl bromide and ethylene dibromide, liquid; mixtures of methyl bromide and chlorpicrin, liquid; mixtures of methyl bromide and petroleum solvents, liquid; or methyl bromide and nonflammable, nonliquefied compressed gas mixtures, liquid; commercially free of corroding components, and protected externally by a suitable corrosion resistant coating (such as galvanizing or painting) and internally by a suitable corrosion resistant lining (such as galvanizing) may be tested every 10 years instead of every five years, provided a visual internal and external examination of the cylinder is conducted every five years in accordance with CGA Pamphlet C–6. The cylinder must be examined at each filling, and rejected if a dent, corroded area, leak or other condition indicates possible weakness.

(g) *Visual inspections.* A cylinder conforming to a specification listed in the table in this paragraph (g) and used exclusively in the service indicated may, instead of a periodic hydrostatic test, be given a complete external visual inspection at the time periodic requalification becomes due. External visual inspection must be in conformance with CGA C–6 or C–6.3, as applicable. When this inspection is used instead of hydrostatic testing, subsequent inspections are required at five-year intervals after the first inspection. Inspections must be made only by persons holding a current RIN and the results recorded and maintained in conformance with §180.215. Records must include: Date of inspection (month and year); DOT-specification number; cylinder identification (registered symbol and serial number, date of manufacture, and owner); type of cylinder protective coating (including statement as to need of refinishing or recoating); conditions checked (*e.g.*, leakage, corrosion, gouges, dents or digs in shell or heads,

broken or damaged footring or protective ring or fire damage); and disposition of cylinder (returned to service, returned to cylinder manufacturer for repairs or condemned). A cylinder passing requalification by the external visual inspection must be marked in conformance with §180.213. Specification cylinders must be in exclusive service as shown in table 2 to this paragraph (g):

TABLE 2 TO PARAGRAPH (g)

Cylinders conforming to—	Used exclusively for—
DOT 3A, DOT 3AA, DOT 3A480X, DOT 4AA480	Anhydrous ammonia of at least 99.95% purity.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW	Butadiene, inhibited, that is commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 3B, DOT 4AA480, DOT 4B, DOT 4BA, DOT 4BW	Cyclopropane that is commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E	Chlorinated hydrocarbons and mixtures thereof that are commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E	Fluorinated hydrocarbons and mixtures thereof that are commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E	Liquefied hydrocarbon gas that is commercially free of corroding components.
DOT 3A, DOT 3AA, DOT 3A480X, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E	Liquefied petroleum gas that meets the detail requirements limits in Table 1 of ASTM 1835, Standard Specification for Liquefied Petroleum (LP) Gases (incorporated by reference; see § 171.7 of this subchapter) or an equivalent standard containing the same limits.
DOT 3A, DOT 3AA, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E	Methylacetylene-propadiene, stabilized, that is commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW, DOT 4E	Propylene that is commercially free from corroding components.
DOT 3A, DOT 3AA, DOT 3B, DOT 4B, DOT 4BA, DOT 4BW	Anhydrous mono, di, trimethylamines that are commercially free from corroding components.
DOT 4B240, DOT 4BW240	Ethyleneimine, stabilized.
DOT 4BW	Alkali metal alloys, liquid, n.o.s., Alkali metal dispersions or Alkaline earth metal dispersions, Potassium, Potassium Sodium alloys and Sodium that are commercially free of corroding components.

(h) *Cylinders containing anhydrous ammonia.* A cylinder conforming to specification DOT 3A, 3A480X, or 4AA480 used exclusively for anhydrous ammonia, commercially free from corroding components, and protected externally by a suitable corrosion-resistant coating (such as paint) may be requalified every 10 years instead of every five years.

(i) *Requalification of DOT-8 series cylinders.* (1) Each owner of a DOT-8 series cylinder used to transport acetylene must have the cylinder shell and the porous filler requalified in accordance with CGA Pamphlet C–13 (IBR, see §171.7 of this subchapter). Requalification must be performed in accordance with the following schedule:

Date of cylinder manufacture	Shell (visual inspection) requalification		Porous filler requalification	
	Initial	Subsequent	Intial	Subsequent
Before January 1, 1991	Before January 1, 2001	10 years	Before January 1, 2011	Not required.
On or after January 1, 1991.	10 years[1]	10 years	5 to 20 years[2]	Not required.

[1] Years from the date of cylinder manufacture.
[2] No sooner than 5 years, and no later than 20 years from the date of manufacture.

(2) Unless requalified and marked in accordance with CGA Pamphlet C–13 before October 1, 1994, an acetylene cylinder must be requalified by a person who holds a current RIN.

(3) If a cylinder valve is replaced, a cylinder valve of the same weight must be used or the tare weight of the cylinder must be adjusted to compensate for valve weight differential.

(4) The person performing a visual inspection or requalification must record the results as specified in §180.215.

(5) The person performing a visual inspection or requalification must mark the cylinder as specified in §180.213.

(j) *Cylinder used as a fire extinguisher.* Only a DOT-specification cylinder used as a fire extinguisher in conformance with §173.309(a) of this subchapter may be requalified in conformance with this paragraph (j). The testing procedures, calibration of the testing equipment, accuracy of the pressure indicating device, accuracy of the testing equipment must be as prescribed in CGA C–1.

(1) A DOT 4B, 4BA, 4B240ET or 4BW cylinder used as a fire extinguisher may be tested as follows:

(i) For a cylinder with a water capacity of 5.44 kg (12 pounds) or less, by the water-jacket, direct expansion or proof pressure test methods as prescribed in CGA C–1. A requalification must be performed by the end of 12 years after the original test date and at 12-year intervals thereafter.

(A) Each cylinder must be tested to a minimum of two (2) times service pressure.

(B) When testing using the water-jacket or direct expansion test method, the permanent volumetric expansion may not exceed 10 percent of total volumetric expansion at test pressure.

(C) When testing using the proof pressure test method, the cylinder must be carefully examined under test pressure and removed from service if a leak or defect is found.

(ii) For a cylinder having a water capacity over 5.44 kg (12 pounds), by the water-jacket, direct expansion or proof pressure test methods as prescribed in CGA C–1. For the water-jacket or direct expansion test, the requalification must be performed by the end of 12 years after the original test date and at 12-year intervals theafter. For the proof-pressure test, a requalification must be performed by the end of 12 years after the original test date and at seven (7) year intervals.

(A) Each cylinder must be tested to a minimum of two (2) times service pressure.

(B) When testing using the water-jacket or direct expansion test method, the permanent volumetric expansion may not exceed 10 percent of total volumetric expansion at test pressure.

(C) When testing using the proof pressure test method, the cylinder must be carefully examined under test pressure and removed from service if a leak or defect is found.

(2) A DOT 3A, 3AA, or 3AL cylinder must be requalified by:

(i) The water-jacket or direct expansion method. A requalification must be performed 12 years after the original test date and at 12-year intervals thereafter.

(ii) Each cylinder must be tested to a minimum of 5/3 times service pressure.

(iii) When testing using the water-jacket or direct expansion test method, the permanent volumetric expansion may not exceed 10 percent of total volumetric expansion at test pressure.

(k) *3HT cylinders.* In addition to the other requirements of this section, a cylinder marked DOT-3HT must be requalified in accordance with CGA C–8 (IBR, see § 171.7 of this subchapter).

(l) *Requalification of foreign cylinders filled for export.* A cylinder manufactured outside the United States, other than as provided in §§ 171.12(a) and 171.23(a) of this subchapter, that has not been manufactured, inspected, tested and marked in accordance with part 178 of this subchapter may be filled with compressed gas in the United States, and shipped solely for export if it meets the following requirements, in addition to other requirements of this subchapter:

(1) It has been inspected, tested and marked in conformance with the procedures and requirements of this subpart or the Associate Administrator has authorized the filling company to fill foreign cylinders under an alternative method of qualification; and

(2) It is offered for transportation in conformance with the requirements of §§ 171.12(a)(4) or 171.23(a)(5) of this subchapter.

(m) *DOT–3AL cylinders manufactured of 6351–T6 aluminum alloy.* In addition to the periodic requalification and marking described in § 180.205, each cylinder manufactured of aluminum alloy 6351–T6 used in self-contained underwater breathing apparatus (SCUBA), self-contained breathing apparatus (SCBA), or oxygen service must be requalified and inspected for sustained load cracking in accordance with the non-destructive examination method described in the following table. Each cylinder with sustained load cracking that has expanded into the neck threads must be condemned in accordance with § 180.205(i). This provision does not apply to cylinders used for carbon dioxide, fire extinguisher or other industrial gas service.

REQUALIFICATION AND INSPECTION OF DOT–3AL CYLINDERS MADE OF ALUMINUM ALLOY 6351–T6

Requalification requirement	Examination procedure [1]	Sustained Load Cracking Condemnation Criteria [2]	Requalification period (years)
Eddy current examination combined with visual inspection.	Eddy current—In accordance with Appendix C of this part. Visual inspection—In accordance with CGA Pamphlet C–6.1 (IBR; see § 171.7 of this subchapter).	Any crack in the neck or shoulder of 2 thread lengths or more.	5

[1] The requalifier performing eddy current must be familiar with the eddy current equipment and must standardize (calibrate) the system in accordance with the requirements provided in Appendix C to this part.

[2] The eddy current must be applied from the inside of the cylinder's neck to detect any sustained load cracking that has expanded into the neck threads.

[67 FR 51660, Aug. 8, 2002, as amended at 68 FR 24662, May 8, 2003; 68 FR 55544, Sept. 26, 2003; 68 FR 48572, Aug. 14, 2003; 68 FR 75764, Dec. 31, 2003; 70 FR 73166, Dec. 9, 2005; 71 FR 51128, Aug. 29, 2005; 72 FR 55696, Oct. 1, 2007; 74 FR 53189, Oct. 16, 2009; 81 FR 3685, Jan. 21, 2016; 81 FR 35545, June 2, 2016; 85 FR 68797, Oct. 30, 2020; 85 FR 75716, Nov. 25, 2020; 85 FR 85434, Dec. 28, 2020]

EDITORIAL NOTE: At 71 FR 54397, Sept. 14, 2006, § 180.209 was amended in (a)(1) table 1; however, because of the inaccurate amendatory language, the amendment could not be incorporated.

§ 180.211 Repair, rebuilding and reheat treatment of DOT-4 series specification cylinders.

(a) *General requirements for repair and rebuilding.* Any repair or rebuilding of a DOT–4 series cylinder must be performed by a person holding an approval as specified in § 107.805 of this chapter or by a registered facility in Canada in accordance with the Transport Canada TDG Regulations (IBR, see § 171.7 of this subchapter). A person performing