Subpart C—Qualification, Maintenance and Use of Cylinders

Source: 67 FR 51660, Aug. 8, 2002, unless otherwise noted.

§ 180.201 Applicability.

This subpart prescribes requirements, in addition to those contained in parts 107, 171, 172, 173, and 178 of this chapter, for the continuing qualification, maintenance, or periodic requalification of DOT specification and exemption cylinders and UN pressure receptacles.

[71 FR 33894, June 12, 2006]

§ 180.203 Definitions.

As used in this section, the word “cylinder” includes UN pressure receptacles. In addition to the definitions contained in §171.8 of this subchapter, the following definitions apply to this subpart:

Commercially free of corrosive components means a hazardous material having a dew point at or below minus 46.7 °C (minus 52 ° F) at 101kPa (1 atmosphere) and free of components that will adversely react with the cylinder (e.g. chemical stress corrosion).

Condemn means a determination that a cylinder is unserviceable for the continued transportation of hazardous materials in commerce and that the cylinder may not be restored by repair, rebuilding, requalification, or any other procedure.

Defect means an imperfection requiring removal of a cylinder from service.

Elastic expansion means a temporary increase in a cylinder's volume, due to application of pressure, that is lost when pressure is released (elastic expansion = total expansion minus permanent expansion).

Filled or *charged* means an introduction or presence of a hazardous material in a cylinder.

Non-corrosive service means a hazardous material that, in the presence of moisture, is not corrosive to the materials of construction of a cylinder (including valve, pressure relief device, etc.).

Over-heated means a condition in which the temperature of any portion of an aluminum cylinder has reached 176 °C (350 °F) or higher, or in which the temperature of any portion of a steel or nickel cylinder has reached 343 °C (650 °F) or higher.

Permanent expansion means a permanent increase in a cylinder's volume after the test pressure is released.

Proof pressure test means a pressure test by interior pressurization without the determination of a cylinder's expansion.

Rebuild means the replacement of a pressure part (e.g. a wall, head, or pressure fitting) by welding.

Rejected cylinder means a cylinder that cannot be used for the transportation of a hazardous material in commerce without repair, rebuilding, and requalification.

Repair means a procedure for correction of a rejected cylinder that may involve welding.

Requalification means the completion of a visual inspection and/or the test(s) required to be performed on a cylinder to determine its suitability for continued service.

Requalification identification number or RIN means a code assigned by DOT to uniquely identify a cylinder requalification, repair, or rebuilding facility.

Test pressure means the pressure used for the requalification of a cylinder.

Total expansion means the total increase in a cylinder's volume due to application of the test pressure.

Visual inspection means an internal or external visual examination, or both, performed as part of the cylinder requalification process.

Volumetric expansion test means a pressure test to determine the total and permanent expansion of a cylinder at a given pressure. The *volumetric expansion test* is conducted using the water jacket or direct expansion methods:

(1) *Water jacket method* means a volumetric expansion test to determine a cylinder's total and permanent expansion by measuring the difference between the volume of water the cylinder externally displaces at test pressure and the volume of water the cylinder externally displaces at ambient pressure.

(2) *Direct expansion method* means a volumetric expansion test to calculate a cylinder's total and permanent expansion by measuring the amount of water forced into a cylinder at test pressure, adjusted for the compressibility of water, as a means of determining the expansion.

[67 FR 51660, Aug. 8, 2002, as amended at 71 FR 33894, June 12, 2006]

§ 180.205 General requirements for requalification of specification cylinders.

(a) *General.* Each cylinder used for the transportation of hazardous materials must be an authorized packaging. To qualify as an authorized packaging, each cylinder must conform to this subpart, the applicable requirements specified in part 173 of this subchapter, and the applicable requirements of subpart C of part 178 of this subchapter.

(b) *Persons performing requalification functions.* No person may represent that a repair or requalification of a cylinder has been performed in accordance with the requirements in this subchapter unless that person holds a current approval issued under the procedural requirements prescribed in subpart I of part 107 of this chapter. No person may mark a cylinder with a RIN and a requalification date or otherwise represent that a DOT specification or special permit cylinder has been requalified unless all applicable requirements of this subpart have been met. A person who requalifies cylinders must maintain the records prescribed in §180.215 at each location at which it inspects, tests, or marks cylinders.

(c) *Periodic requalification of cylinders.* Each cylinder bearing a DOT specification marking must be requalified and marked as specified in the Requalification Table in this subpart. Each cylinder bearing a DOT special permit number must be requalified and marked in conformance with this section and the terms of the applicable special permit. No cylinder may be filled with a hazardous material and offered for transportation in commerce unless that cylinder has been successfully requalified and marked in accordance with this subpart. A cylinder may be requalified at any time during or before the month and year that the requalification is due. However, a cylinder filled before the requalification becomes due may remain in service until it is emptied. A cylinder with a specified service life may not be refilled and offered for transportation after its authorized service life has expired.

(1) Each cylinder that is requalified in accordance with the requirements specified in this section must be marked in accordance with §180.213.

(2) Each cylinder that fails requalification must be:

(i) Rejected and may be repaired or rebuilt in accordance with §180.211 or §180.212, as appropriate; or

(ii) Condemned in accordance with paragraph (i) of this section.

(3) For DOT specification cylinders, the marked service pressure may be changed upon approval of the Associate Administrator and in accordance with written procedures specified in the approval.

(4) For a specification 3, 3A, 3AA, 3AL, 3AX, 3AXX, 3B, 3BN, or 3T cylinder filled with gases in other than Division 2.2, from the first requalification due on or after December 31, 2003, the burst pressure of a CG–1, CG–4, or CG–5 pressure relief device must be at test pressure with a tolerance of plus zero to minus 10%. An additional 5% tolerance is allowed when a combined rupture disc is placed inside a holder. This requirement does not apply if a CG–2, CG–3 or CG–9 thermally activated relief device or a CG–7 reclosing pressure valve is used on the cylinder.

(d) *Conditions requiring test and inspection of cylinders.* Without regard to any other periodic requalification requirements, a cylinder must be tested and inspected in accordance with this section prior to further use if—

(1) The cylinder shows evidence of dents, corrosion, cracked or abraded areas, leakage, thermal damage, or any other condition that might render it unsafe for use in transportation;

(2) The cylinder has been in an accident and has been damaged to an extent that may adversely affect its lading retention capability;

(3) The cylinder shows evidence of or is known to have been over-heated; or

(4) The Associate Administrator determines that the cylinder may be in an unsafe condition.

(e) *Cylinders containing Class 8 (corrosive) liquids.* A cylinder previously containing a Class 8 (corrosive) liquid may not be used to transport a Class 2 material in commerce unless the cylinder is—

(1) Visually inspected, internally and externally, in accordance with paragraph (f) of this section and the inspection is recorded as prescribed in §180.215;

(2) Requalified in accordance with this section, regardless of the date of the previous requalification;

(3) Marked in accordance with §180.213; and

(4) Decontaminated to remove all significant residue or impregnation of the Class 8 material.

(f) *Visual inspection.* Except as otherwise provided in this subpart, each time a cylinder is pressure tested, it must be given an internal and external visual inspection.

(1) The visual inspection must be performed in accordance with the following CGA Pamphlets: C–6 for steel and nickel cylinders (IBR, see §171.7 of this subchapter); C–6.1 for seamless aluminum cylinders (IBR, see §171.7 of this subchapter); C–6.2 for fiber reinforced composite special permit cylinders (IBR, see §171.7 of this subchapter); C–6.3 for low pressure aluminum cylinders (IBR, see §171.7 of this subchapter); C–8 for DOT 3HT cylinders (IBR, see §171.7 of this subchapter); and C–13 for DOT 8 series cylinders (IBR, see §171.7 of this subchapter).

(2) For each cylinder with a coating or attachments that would inhibit inspection of the cylinder, the coating or attachments must be removed before performing the visual inspection.

(3) Each cylinder subject to visual inspection must be approved, rejected, or condemned according to the criteria in the applicable CGA pamphlet.

(4) In addition to other requirements prescribed in this paragraph (f), each specification cylinder manufactured of aluminum alloy 6351–T6 and used in self-contained underwater breathing apparatus (SCUBA), self-contained breathing apparatus (SCBA), or oxygen service must be inspected for sustained load cracking in accordance with Appendix C of this part at the first scheduled 5-year requalification period after January 1, 2007, and every five years thereafter.

(g) *Pressure test.* (1) Unless otherwise provided, each cylinder required to be retested under this subpart must be retested by means suitable for measuring the expansion of the cylinder under pressure. Bands and other removable attachments must be loosened or removed before testing so that the cylinder is free to expand in all directions.

(2) The pressure indicating device of the testing apparatus must permit reading of pressures to within 1% of the minimum prescribed test pressure of each cylinder tested, except that for an analog device, interpolation to1/2of the marked gauge divisions is acceptable. The expansion-indicating device of the testing apparatus must also permit incremental reading of the cylinder expansion to 1% of the total expansion of each cylinder tested or 0.1 cc, whichever is larger. Midpoint visual interpolation is permitted.

(3) Each day before retesting, the retester shall confirm, by using a calibrated cylinder or other method authorized in writing by the Associate Administrator, that:

(i) The pressure-indicating device, as part of the retest apparatus, is accurate within ±1.0% of the prescribed test pressure of any cylinder tested that day. The pressure indicating device, itself, must be certified as having an accuracy of ±0.5%, or better, of its full range, and must permit readings of pressure from 90%-110% of the minimum prescribed test pressure of the cylinder to be tested. The accuracy of the pressure indicating device within the test system can be demonstrated at any point within 500 psig of the actual test pressure for test pressures at or above 3000 psig, or 10% of the actual test pressure for test pressures below 3000 psig.

(ii) The expansion-indicating device, as part of the retest apparatus, gives a stable reading of expansion and is accurate to ±1.0% of the total expansion of any cylinder tested or 0.1 cc, whichever is larger. The expansion-indicating device itself must have an accuracy of ±0.5%, or better, of its full scale.

(4) The test equipment must be verified to be accurate within ±1.0% of the calibrated cylinder's pressure and corresponding expansion values. This may be accomplished by bringing the pressure to a value shown on the calibration certificate for the calibrated cylinder used and verifying that the resulting total expansion is within ±1.0% of the total expansion shown on the calibration certificate. Alternatively, calibration may be demonstrated by bringing the total expansion to a known value on the calibration certificate for the calibrated cylinder used and verifying that the resulting pressure is within ±1.0% of the pressure shown on the calibration certificate. The calibrated cylinder must show no permanent expansion. The retester must demonstrate calibration in conformance with this paragraph (g) to an authorized inspector on any day that it retests cylinders. A retester must maintain calibrated cylinder certificates in conformance with §180.215(b)(4).

(5) Minimum test pressure must be maintained for at least 30 seconds, and as long as necessary for complete expansion of the cylinder. A system check may be performed at or below 90% of test pressure prior to the retest. In the case of a malfunction of the test equipment, the test may be repeated at a pressure increased by 10% or 100 psig, whichever is less. This paragraph (g) does not authorize retest of a cylinder otherwise required to be condemned under paragraph (i) of this section.

(h) *Cylinder rejection.* A cylinder must be rejected when, after a visual inspection, it meets a condition for rejection under the visual inspection requirements of paragraph (f) of this section.

(1) Except as provided in paragraphs (h)(3) and (h)(4) of this section, a cylinder that is rejected may not be marked as meeting the requirements of this section.

(2) The requalifier must notify the cylinder owner, in writing, that the cylinder has been rejected.

(3) Unless the cylinder is requalified in conformance with requirements in §180.211, it may not be filled with a hazardous material and offered for transportation in commerce where use of a specification packaging is required.

(4) A rejected cylinder with a service pressure of less than 900 psig may be requalified and marked if the cylinder is repaired or rebuilt and subsequently inspected and tested in conformance with—

(i) The visual inspection requirements of paragraph (f) of this section;

(ii) Part 178 of this subchapter and this part;

(iii) Any special permit covering the manufacture, requalification, and/or use of that cylinder; and

(iv) Any approval required under §180.211.

(i) *Cylinder condemnation.* (1) A cylinder must be condemned when—

(i) The cylinder meets a condition for condemnation under the visual inspection requirements of paragraph (f) of this section.

(ii) The cylinder leaks through its wall.

(iii) Evidence of cracking exists to the extent that the cylinder is likely to be weakened appreciably.

(iv) For a DOT specification cylinder, other than a DOT 4E aluminum cylinder or a special permit cylinder, permanent expansion exceeds 10 percent of total expansion.

(v) For a DOT 3HT cylinder—

(A) The pressure test yields an elastic expansion exceeding the marked rejection elastic expansion (REE) value.

(B) The cylinder shows evidence of denting or bulging.

(C) The cylinder bears a manufacture or an original test date older than twenty-four years or after 4380 pressurizations, whichever occurs first. If a cylinder is refilled, on average, more than once every other day, an accurate record of the number of rechargings must be maintained by the cylinder owner or the owner's agent.

(vi) For a DOT 4E aluminum cylinder, permanent expansion exceeds 12 percent of total expansion.

(vii) For a DOT special permit cylinder, permanent expansion exceeds the limit in the applicable special permit, or the cylinder meets another criterion for condemnation in the applicable special permit.

(viii) For an aluminum or an aluminum-lined composite special permit cylinder, the cylinder is known to have been or shows evidence of having been over-heated.

(2) When a cylinder must be condemned, the requalifier must—

(i) Stamp a series of X's over the DOT specification number and the marked pressure or stamp “CONDEMNED” on the shoulder, top head, or neck using a steel stamp;

(ii) For composite cylinders, securely affix to the cylinder a label with the word “CONDEMNED” overcoated with epoxy near, but not obscuring, the original cylinder manufacturer's label; or

(iii) As an alternative to the stamping or labeling as described in this paragraph (i)(2), at the direction of the owner, the requalifier may render the cylinder incapable of holding pressure.

(3) No person may remove or obliterate the “CONDEMNED” marking. In addition, the requalifier must notify the cylinder owner, in writing, that the cylinder is condemned and may not be filled with hazardous material and offered for transportation in commerce where use of a specification packaging is required.

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§ 180.207 Requirements for requalification of UN pressure receptacles.

(a) *General.* (1) Each UN pressure receptacle used for the transportation of hazardous materials must conform to the requirements prescribed in paragraphs (a), (b) and (d) in §180.205.

(2) No pressure receptacle due for requalification may be filled with a hazardous material and offered for transportation in commerce unless that pressure receptacle has been successfully requalified and marked in accordance with this subpart. A pressure receptacle may be requalified at any time during or before the month and year that the requalification is due. However, a pressure receptacle filled before the requalification becomes due may remain in service until it is emptied.

(3) No person may requalify a UN composite pressure receptacle for continued use beyond its 15-years authorized service life. A pressure receptacle with a specified service life may not be refilled and offered for transportation after its authorized service life has expired unless approval has been obtained in writing from the Associate Administrator.

(b) *Periodic requalification of UN pressure receptacles.* (1) Each pressure receptacle that is successfully requalified in accordance with the requirements specified in this section must be marked in accordance with §180.213. The requalification results must be recorded in accordance §180.215.

(2) Each pressure receptacle that fails requalification must be rejected or condemned in accordance with the applicable ISO requalification standard.

(c) *Requalification interval.* Each UN pressure receptacle that becomes due for periodic requalification must be requalified at the interval specified in the following table:

Table 1—Requalification Intervals of UN Pressure Receptacles

Interval (years)	**UN pressure receptacles/hazardous materials**
10	Pressure receptacles for all hazardous materials except as noted below (also for dissolved acetylene, see paragraph (d)(3) of this section):
5	Composite pressure receptacles.
5	Pressure receptacles used for: All Division 2.3 materials. UN1013, Carbon dioxide.
	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.

(d) *Requalification procedures.* Each UN pressure receptacle that becomes due for requalification must be requalified at the interval prescribed in paragraph (c) of this section and in accordance with the procedures contained in the following standard, as applicable. 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 MEGC's pressure receptacles, must be requalified in accordance with ISO 6406 (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.

(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 (IBR, see §171.7 of this subchapter). 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 (IBR, see §171.7 of this subchapter).

[71 FR 33894, June 12, 2006, as amended at 71 FR 54397, Sept. 14, 2006]

§ 180.209 Requirements for requalification of specification cylinders.

(a) *Periodic qualification of cylinders.* (1) 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—Requalification of Cylinders[1]

Specification under which cylinder was made	Minimum test pressure (psig)[2]	Requalification period (years)
DOT 3	3000 psig	5
DOT 3A, 3AA	5/3 times service pressure, except noncorrosive service (*see* §180.209 (g))	5, 10, or 12 (*see* §180.209(b), (f), (h), and (j)
DOT 3AL	5/3 times service pressure	5 or 12 (see §180.209(j) and §180.209(m)[3]).
DOT 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, 10, or 12 (*see* §180.209(e), (f), and (j))
4D, 4DA, 4DS	2 times service	5
DOT 4E	2 times service pressure, except non-corrosive (*see* §180.209(g))	5
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.

(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) Before each refill, the cylinder is removed from any cluster, bank, group, rack or vehicle and passes the hammer test specified in CGA Pamphlet C–6 (IBR, see §171.7 of this subchapter).

(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 or of internal or external corrosion, denting, bulging or rough usage to the extent that it is likely to be weakened appreciably, or that has lost five percent or more of its official tare weight must be requalified before being refilled and offered for transportation. (Refer to CGA Pamphlet C–6 or C–6.3, as applicable, regarding cylinder weakening.) After testing, the actual tare weight must be recorded as the new tare weight.

(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) *Proof pressure test* A cylinder made in conformance with specifications DOT 4B, 4BA, 4BW, or 4E used exclusively for: liquefied petroleum gas that meets the detail requirement limits in Table I of ASTM D 1835, “Standard Specification for Liquefied Petroleum (LP) Gases” (IBR see §171.7 of this subchapter) or an equivalent standard containing the same limits; anhydrous dimethylamine; anhydrous methylamine; anhydrous trimethylamine; methyl chloride; methylacetylene-propadiene stabilized; or dichlorodifluoromethane, difluoroethane, difluorochloroethane, chlorodifluoromethane, chlorotetrafluoroethane, trifluorochloroethylene, or mixture thereof, or mixtures of one or more with trichlorofluoromethane; and commercially free from

corroding components and protected externally by a suitable corrosion-resistant coating (such as galvanizing or painting) may be requalified by volumetric expansion testing every 12 years instead of every five 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 seven years after expiration of the first 12-year period. When subjected to a proof pressure test, 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 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 accordance with CGA Pamphlet C–6 or C–6.3, as applicable (IBR, see §171.7 of this subchapter). When this inspection is used instead of hydrostatic pressure testing, subsequent inspections are required at five-year intervals after the first inspection. After May 31, 2004, inspections must be made only by persons holding a current RIN and the results recorded and maintained in accordance 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); 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 accordance with §180.213. Specification cylinders must be in exclusive service as shown in the following table:

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 3A480X, DOT 3AA, 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 from 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	Anhydrous mono, di,trimethylamines that are commercially free from corroding components.
DOT 4B240, DOT 4BW240	Ethyleneimine, stabilized.

(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 and meeting Special Provision 18 in §172.102(c)(1) of this subchapter may be requalified in accordance with this paragraph (j).

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

(i) For a cylinder with a water capacity of 5.44 kg (12 lb) or less, by volumetric expansion test using the water jacket method or by proof pressure test. A requalification must be performed by the end of 12 years after the original test date and at 12-year intervals thereafter.

(ii) For a cylinder having a water capacity over 5.44 kg (12 lb)—

(A) *By proof pressure test.* A requalification must be performed by the end of 12 years after the original test date and at 7-year intervals; or

(B) *By volumetric expansion test using the water jacket method.* A requalification must be performed 12 years after the original test date and at 12-year intervals thereafter.

(2) A DOT 3A, 3AA, or 3AL cylinder must be requalified by volumetric expansion test using the water jacket method. A requalification must be performed 12 years after the original test date and at 12-year intervals thereafter.

(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

§171.12a 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 (with only the month and year of test) 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 §173.301(l) 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]

Editorial Note: The following amendment could not be incorporated into §180.209 because of the inaccurate amendatory instruction. For the convenience of the user the amendatory instruction and text is set forth as follows:

At 71 FR 54397, Sept. 14, 2006, §180.209 was amended in paragraph (a)(1), the first and third entries in Table 1 were revised to read as follows:

§ 180.209 Requirements for requalification of specification cylinders.

(a) * * *

(1) * * *

Table 1—Requalification of Cylinders

Specification under which cylinder was made	Minimum test pressure (psig)[2]	Requalification period (years)
* * * * * * *		
4B, 4BA, 4BW, 4B240ET	2 times service pressure, except non-corrosive (*see* §180.209(g))	5, 7, 10, or 12 (*see* §180.209(e), (f), and (j)).
* * * * * * *		
DOT 4E	2 times service pressure, except non-corrosive (*see* §180.209(g))	5 or 7 (see §180.209(e)).

§ 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. A person performing a rebuild function is considered a manufacturer subject to the requirements of §178.2(a)(2) and subpart C of part 178 of this subchapter. The person performing a repair, rebuild, or reheat treatment must record the test results as specified in §180.215. Each cylinder that is successfully repaired or rebuilt must be marked in accordance with §180.213.

(b) *General repair requirements.* Each repair of a DOT 4-series cylinder must be made in accordance with the following conditions:

(1) The repair and the inspection of the work performed must be made in accordance with the requirements of the cylinder specification.

(2) The person performing the repair must use the procedure, equipment, and filler metal or brazing material as authorized by the approval issued under §107.805 of this chapter.

(3) Welding and brazing must be performed on an area free from contaminants.

(4) A weld defect, such as porosity in a pressure retaining seam, must be completely removed before re-welding. Puddling may be used to remove a weld defect only by the tungsten inert gas shielded arc process.

(5) After removal of a non-pressure attachment and before its replacement, the cylinder must be given a visual inspection in accordance with §180.205(f).

(6) Reheat treatment of DOT 4B, 4BA or 4BW specification cylinders after replacement of non-pressure attachments is not required when the total weld material does not exceed 20.3 cm (8 inches). Individual welds must be at least 7.6 cm (3 inches) apart.

(7) After repair of a DOT 4B, 4BA or 4BW cylinder, the weld area must be leak tested at the service pressure of the cylinder.

(8) Repair of weld defects must be free of cracks.

(9) When a non-pressure attachment with the original cylinder specification markings is replaced, all markings must be transferred to the attachment on the repaired cylinder.

(10) Walls, heads or bottoms of cylinders with defects or leaks in base metal may not be repaired, but may be replaced as provided for in paragraph (d) of this section.

(c) *Additional repair requirements for 4L cylinders.* (1) Repairs to a DOT 4L cylinder must be performed in accordance with paragraphs (a) and (b) of this section and are limited to the following:

(i) The removal of either end of the insulation jacket to permit access to the cylinder, piping system, or neck tube.

(ii) The replacement of the neck tube. At least a 13 mm (0.51 inch) piece of the original neck tube must be protruding above the cylinder's top end. The original weld attaching the neck tube to the cylinder must be sound and the replacement neck tube must be welded to this remaining piece of the original neck tube.

(iii) The replacement of material such as, but not limited to, the insulating material and the piping system within the insulation space is authorized. The replacement material must be equivalent to that used at the time of original manufacture.

(iv) Other welding procedures that are permitted by CGA Pamphlet C–3 (IBR, see §171.7 of this subchapter), and not excluded by the definition of “rebuild,” are authorized.

(2) After repair, the cylinder must be—

(i) Pressure tested in accordance with the specifications under which the cylinder was originally manufactured;

(ii) Leak tested before and after assembly of the insulation jacket using a mass spectrometer detection system; and

(iii) Tested for heat conductivity requirements.

(d) *General rebuilding requirements.* (1) The rebuilding of a DOT 4-series cylinder must be made in accordance with the following requirements:

(i) The person rebuilding the cylinder must use the procedures and equipment as authorized by the approval issued under §107.805 of this chapter.

(ii) After removal of a non-pressure component and before replacement of any non-pressure component, the cylinder must be visually inspected in accordance with CGA Pamphlet C–6 (IBR, see §171.7 of this subchapter).

(iii) The rebuilder may rebuild a DOT 4B, 4BA or 4BW cylinder having a water capacity of 9.07 kg (20 lb) or greater by replacing a head of the cylinder using a circumferential joint. When this weld joint is located at other than an original welded joint, a notation of this modification must be shown on the Manufacturer's Report of Rebuilding in §180.215(c)(2). The weld joint must be on the cylindrical section of the cylinder.

(iv) Any welding and the inspection of the rebuilt cylinder must be in accordance with the requirements of the applicable cylinder specification and the following requirements:

(A) Rebuilding of any cylinder involving a joint subject to internal pressure may only be performed by fusion welding;

(B) Welding must be performed on an area free from contaminants; and

(C) A weld defect, such as porosity in a pressure retaining seam, must be completely removed before re-welding. Puddling may be used to remove a weld defect only by using the tungsten inert gas shielded arc process.

(2) Any rebuilt cylinder must be—

(i) Heat treated in accordance with paragraph (f) of this section;

(ii) Subjected to a volumetric expansion test on each cylinder. The results of the tests must conform to the applicable cylinder specification;

(iii) Inspected and have test data reviewed to determine conformance with the applicable cylinder specification; and

(iv) Made of material conforming to the specification. Determination of conformance shall include chemical analysis, verification, inspection and tensile testing of the replaced part. Tensile tests must be performed on the replaced part after heat treatment by lots defined in the applicable specification.

(3) For each rebuilt cylinder, an inspector's report must be prepared to include the information listed in §180.215(c).

(4) Rebuilding a cylinder with brazed seams is prohibited.

(5) When an end with the original cylinder specification markings is replaced, all markings must be transferred to the rebuilt cylinder.

(e) *Additional rebuilding requirements for DOT 4L cylinders.* (1) The rebuilding of a DOT 4L cylinder must be performed in accordance with paragraph (d) of this section. Rebuilding of a DOT 4L cylinder is:

(i) Substituting or adding material in the insulation space not identical to that used in the original manufacture of that cylinder;

(ii) Making a weld repair not to exceed 150 mm (5.9 inches) in length on the longitudinal seam of the cylinder or 300 mm (11.8 inches) in length on a circumferential weld joint of the cylinder; or

(iii) Replacing the outer jacket.

(2) Reheat treatment of cylinders is prohibited.

(3) After rebuilding, each inner containment vessel must be proof pressure tested at 2 times its service pressure. Each completed assembly must be leak-tested using a mass spectrometer detection system.

(f) *Reheat treatment.* (1) Prior to reheat treatment, each cylinder must be given a visual inspection, internally and externally, in accordance with §180.205(f).

(2) Cylinders must be segregated in lots for reheat treatment. The reheat treatment and visual inspection must be performed in accordance with the specification for the cylinders except as provided in paragraph (f)(4) of this section.

(3) After reheat treatment, each cylinder in the lot must be subjected to a volumetric expansion test and meet the acceptance criteria in the applicable specification or be scrapped.

(4) After all welding and heat treatment, a test of the new weld must be performed as required by the original specification. The test results must be recorded in accordance with §180.215.

[67 FR 51660, Aug. 8, 2002, as amended at 68 FR 24664, May 8, 2003; 68 FR 75764, Dec. 31, 2003; 71 FR 54398, Sept. 14, 2006]

§ 180.212 Repair of seamless DOT 3-series specification cylinders and seamless UN pressure receptacles.

(a) *General requirements for repair of DOT 3-series cylinders and UN pressure receptacles.* (1) No person may repair a DOT 3-series cylinder or a seamless UN pressure receptacle unless—

(i) The repair facility holds an approval issued under the provisions in §107.805 of this chapter; and

(ii) Except as provided in paragraph (b) of this section, the repair and the inspection is performed under the provisions of an approval issued under subpart H of Part 107 of this chapter and conform to the applicable cylinder specification or ISO standard contained in part 178 of this chapter.

(2) The person performing the repair must prepare a report containing, at a minimum, the results prescribed in §180.215.

(b) *Repairs not requiring prior approval.* Approval is not required for the following specific repairs:

(1) The removal and replacement of a neck ring or foot ring on a DOT 3A, 3AA or 3B cylinder or a UN pressure receptacle that does not affect a pressure part of the cylinder when the repair is performed by a repair facility or a cylinder manufacturer of these types of cylinders. The repair may be made by welding or brazing in conformance with the original specification. After removal and before replacement, the cylinder must be visually inspected and any defective cylinder must be rejected. The heat treatment, testing and inspection of the repair must be performed under the supervision of an inspector and must be performed in accordance with the original specification.

(2) External re-threading of DOT 3AX, 3AAX or 3T specification cylinders or a UN pressure receptacle mounted in a MEGC; or the internal re-threading of a DOT–3 series cylinder or a seamless UN pressure receptacle when performed by a cylinder manufacturer of these types of cylinders. The repair work must be performed under the supervision of an independent inspection agency. Upon completion of the re-threading, the threads must be gauged in accordance with Federal Standard H–28 or an equivalent standard containing the same specification limits. The re-threaded cylinder must be stamped clearly and legibly with the words “RETHREAD” on the shoulder, top head, or neck. No DOT specification cylinder or UN cylinder may be re-threaded more than one time without approval of the Associate Administrator.

[71 FR 33895, June 12, 2006, as amended at 71 FR 54398, Sept. 14, 2006; 72 FR 55697, Oct. 1, 2007]

§ 180.213 Requalification markings.

(a) *General.* Each cylinder or UN pressure receptacle requalified in accordance with this subpart with acceptable results must be marked as specified in this section. Required specification markings may not be altered or removed.

(b) *Placement of markings.* Each cylinder must be plainly and permanently marked on the metal of the cylinder as permitted by the applicable specification. Unless authorized by the cylinder specification, marking on the cylinder sidewall is prohibited.

(1) Requalification and required specification markings must be legible so as to be readily visible at all times. Illegible specification markings may be remarked on the cylinder as provided by the original specification. Requalification markings may be placed on any portion of the upper end of the cylinder excluding the sidewall, as provided in this section. Requalification and required specification markings that are illegible may be reproduced on a metal plate and attached as provided by the original specification.

(2) Previous requalification markings may not be obliterated, except that, when the space originally provided for requalification dates becomes filled, additional dates may be added as follows:

(i) All preceding requalification dates may be removed by peening provided that—

(A) Permission is obtained from the cylinder owner;

(B) The minimum wall thickness is maintained in accordance with manufacturing specifications for the cylinder; and

(C) The original manufacturing test date is not removed.

(ii) When the cylinder is fitted with a footring, additional dates may be marked on the external surface of the footring.

(c) *Requalification marking method.* The depth of requalification markings may not be greater than specified in the applicable specification. The markings must be made by stamping, engraving, scribing or other method that produces a legible, durable mark.

(1) A cylinder used as a fire extinguisher (§180.209(j)) may be marked by using a pressure sensitive label.

(2) For a DOT 3HT cylinder, the test date and RIN must be applied by low-stress steel stamps to a depth no greater than that prescribed at the time of manufacture. Stamping on the sidewall is not authorized.

(3) For a composite cylinder, the requalification markings must be applied on a pressure sensitive label, securely affixed in a manner prescribed by the cylinder manufacturer, near the original manufacturer's label. Stamping of the composite surface is not authorized.

(d) *Requalification markings.* Each cylinder successfully passing requalification must be marked with the RIN set in a square pattern, between the month and year of the requalification date. The first character of the RIN must appear in the upper left corner of the square pattern; the second in the upper right; the third in the lower right; and the fourth in the lower left. Example: A cylinder requalified in September 2006, and approved by a person who has been issued RIN “A123”, would be marked plainly and permanently into the metal of the cylinder in accordance with location requirements of the cylinder specification or on a metal plate permanently secured to the cylinder in accordance with paragraph (b) of this section. An example of the markings prescribed in this paragraph (d) is as follows:

A1

9 06 X

32

Where:

“9” is the month of requalification

“A123” is the RIN

“06” is the year of requalification, and

“X” represents the symbols described in paragraphs (f)(2) through (f)(8) of this section.

(1) Upon written request, variation from the marking requirement may be approved by the Associate Administrator.

(2) Exception. A cylinder subject to the requirements of §173.301(l) of this subchapter may not be marked with a RIN.

(e) *Size of markings.* The size of the markings must be at least 6.35 mm (1/4in.) high, except RIN characters must be at least 3.18 mm (1/8in.) high.

(f) *Marking illustrations.* Examples of required requalification markings for DOT specification and special permit cylinders are illustrated as follows:

(1) For designation of the 5-year volumetric expansion test, 10-year volumetric expansion test for UN cylinders and cylinders conforming to §180.209(f) and (h), or 12-year volumetric expansion test for fire extinguishers conforming to §173.309(b) of this subchapter and cylinders conforming to §180.209(e) and 180.209(g), the marking is as illustrated in paragraph (d) of this section.

(2) For designation of the 10-year volumetric expansion test for cylinders conforming to §180.209(b), the marking is as illustrated in paragraph (d) of this section, except that the “X” is replaced with a five-point star.

(3) For designation of special filling limits up to 10% in excess of the marked service pressure for cylinders conforming to §173.302a (b) of this subchapter, the marking is as illustrated in paragraph (d) of this section, except that the “X” is replaced with a plus sign “+”.

(4) For designation of the proof pressure test, the marking is as illustrated in paragraph (d) of this section, except that the “X” is replaced with the letter “S”.

(5) For designation of the 5-year external visual inspection for cylinders conforming to §180.209(g), the marking is as illustrated in

paragraph (d) of this section, except that the “X” is replaced with the letter “E”.

(6) For designation of DOT 8 series cylinder shell requalification only, the marking is as illustrated in paragraph (d) of this section, except that the “X” is replaced with the letter “S”.

(7) For designation of DOT 8 series and UN cylinder shell and porous filler requalification, the marking is as illustrated in paragraph (d) of this section, except that the “X” is replaced with the letters “FS.”

(8) For designation of a nondestructive examination combined with a visual inspection, the marking is as illustrated in paragraph (d) of this section, except that the “X” is replaced with the type of test performed, for example the letters “AE” for acoustic emission or “UE” for ultrasonic examination.

(9) For designation of the eddy current examination combined with a visual inspection, the marking is as illustrated in paragraph (d) of this section, except the “X” is replaced with the letters “VE.”

[67 FR 51660, Aug. 8, 2002, as amended at 70 FR 73166, Dec. 9, 2005; 71 FR 33896, June 12, 2006; 71 FR 51128, Aug. 29, 2006; 71 FR 78635, Dec. 29, 2006]

§ 180.215 Reporting and record retention requirements.

(a) *Facility records.* A person who requalifies, repairs or rebuilds cylinders must maintain the following records where the requalification is performed:

(1) Current RIN issuance letter;

(2) If the RIN has expired and renewal is pending, a copy of the renewal request;

(3) Copies of notifications to Associate Administrator required under §107.805 of this chapter;

(4) Current copies of those portions of this subchapter applicable to its cylinder requalification and marking activities at that location;

(5) Current copies of all special permits governing exemption cylinders requalified or marked by the requalifier at that location; and

(6) The information contained in each applicable CGA or ASTM standard incorporated by reference in §171.7 of this subchapter applicable to the requalifier's activities. This information must be the same as contained in the edition incorporated by reference in §171.7 of this subchapter.

(b) *Requalification records.* Daily records of visual inspection, pressure test, and ultrasonic examination if permitted under a special permit, as applicable, must be maintained by the person who performs the requalification until either the expiration of the requalification period or until the cylinder is again requalified, whichever occurs first. A single date may be used for each test sheet, provided each test on the sheet was conducted on that date. Ditto marks or a solid vertical line may be used to indicate repetition of the preceding entry for the following entries only: date; actual dimensions; manufacturer's name or symbol, if present; owner's name or symbol, if present; and test operator. Blank spaces may not be used to indicate repetition of a prior entry. The records must include the following information:

(1) *Calibration test records.* For each test to demonstrate calibration, the date; serial number of the calibrated cylinder; calibration test pressure; total, elastic and permanent expansions; and legible identification of test operator. The test operator must be able to demonstrate that the results of the daily calibration verification correspond to the hydrostatic tests performed on that day. The daily verification of calibration(s) may be recorded on the same sheets as, and with, test records for that date.

(2) *Pressure test and visual inspection records.* The date of requalification; serial number; DOT specification or special permit number; marked pressure; actual dimensions; manufacturer's name or symbol; owner's name or symbol, if present; result of visual inspection; actual test pressure; total, elastic and permanent expansions; percent permanent expansion; disposition, with reason for any repeated test, rejection or condemnation; and legible identification of test operator. For each cylinder marked pursuant to

§173.302a(b)(5) of this subchapter, the test sheet must indicate the method by which any average or maximum wall stress was computed. Records must be kept for all completed, as well as unsuccessful tests. The entry for a second test after a failure to hold test pressure must indicate the date of the earlier test.

(3) *Wall stress.* Calculations of average and maximum wall stress pursuant to §173.302a(b)(3) of this subchapter, if performed.

(4) *Calibration certificates.* The most recent certificate of calibration must be maintained for each calibrated cylinder.

(c) *Repair, rebuilding or reheat treatment records.* (1) Records covering welding or brazing repairs, rebuilding or reheat treating shall be retained for a minimum of fifteen years by the approved facility.

(2) A record of rebuilding, in accordance with §180.211(d), must be completed for each cylinder rebuilt. The record must be clear, legible, and contain the following information:

(i) Name and address of test facility, date of test report, and name of original manufacturer;

(ii) Marks stamped on cylinder to include specification number, service pressure, serial number, symbol of manufacturer, inspector's mark, and other marks, if any;

(iii) Cylinder outside diameter and length in inches;

(iv) Rebuild process (welded, brazed, type seams, etc.);

(v) Description of assembly and any attachments replaced (*e.g.,* neckrings, footrings);

(vi) Chemical analysis of material for the cylinder, including seat and Code No., type of analysis (ladle, check), chemical components (Carbon (C), Phosphorous (P), Sulfur (S), Silicon (Si), Manganese (Mn), Nickel (Ni), Chromium (Cr), Molybdenum (Mo), Copper (Cu), Aluminum (Al), Zinc (Zn)), material manufacturer, name of person performing the analysis, results of physical tests of material for cylinder (yield strength (psi), tensile strength (psi), elongation percentage (inches), reduction in area percentage, weld bend, tensile bend, name of inspector);

(vii) Results of proof pressure test on cylinder, including test method, test pressure, total expansion, permanent expansion, elastic expansion, percent permanent expansion (permanent expansion may not exceed ten percent (10%) of total expansion), and volumetric capacity (volumetric capacity of a rebuilt cylinder must be within ±3% of the calculated capacity);

(viii) Each report must include the following certification statement: “I certify that this rebuilt cylinder is accurately represented by the data above and conforms to all of the requirements in Subchapter C of Chapter I of Title 49 of the Code of Federal Regulations.”. The certification must be signed by the rebuild technician and principal, officer, or partner of the rebuild facility.

[67 FR 51660, Aug. 8, 2002, as amended at 68 FR 24664, May 8, 2003; 70 FR 73166, Dec. 9, 2005; 71 FR 54398, Sept. 14, 2006; 72 FR 55697, Oct. 1, 2007]

§ 180.217 Requalification requirements for MEGCs.

(a) *Periodic inspections.* Each MEGC must be given an initial visual inspection and test in accordance with §178.75(i) of this subchapter before being put into service for the first time. After the initial inspection, a MEGC must be inspected at least once every five years.

(1) The 5-year periodic inspection must include an external examination of the structure, the pressure receptacles and the service equipment, as follows:

(i) The pressure receptacles are inspected externally for pitting, corrosion, abrasions, dents, distortions, defects in welds or any other conditions, including leakage, that might render the MEGC unsafe for transport.

(ii) The piping, valves, and gaskets are inspected for corroded areas, defects, and other conditions, including leakage, that might render the MEGC unsafe for filling, discharge or transport.

(iii) Missing or loose bolts or nuts on any flanged connection or blank flange are replaced or tightened.

(iv) All emergency devices and valves are free from corrosion, distortion and any damage or defect that could prevent their normal operation. Remote closure devices and self-closing stop valves must be operated to demonstrate proper operation.

(v) Required markings on the MEGC are legible in accordance with the applicable requirements.

(vi) The framework, the supports and the arrangements for lifting the MEGC are in satisfactory condition.

(2) The MEGC's pressure receptacles and piping must be periodically requalified as prescribed in §180.207(c), at the interval specified in Table 1 in §180.207.

(b) *Exceptional inspection and test.* If a MEGC shows evidence of damaged or corroded areas, leakage, or other conditions that indicate a deficiency that could affect the integrity of the MEGC, an exceptional inspection and test must be performed, regardless of the last periodic inspection and test. The extent of the exceptional inspection and test will depend on the amount of damage or deterioration of the MEGC. As a minimum, an exceptional inspection of a MEGC must include inspection as specified in paragraph (a)(1) of this section.

(c) *Correction of unsafe condition.* When evidence of any unsafe condition is discovered, the MEGC may not be returned to service until the unsafe condition has been corrected and the MEGC has been requalified in accordance with the applicable tests and inspection.

(d) *Repairs and modifications to MEGCs.* No person may perform a modification to an approved MEGC that may affect conformance to the applicable ISO standard or safe use, and that involve a change to the design type or affect its ability to retain the hazardous material in transportation. Before making any modification changes to an approved MEGC, the owner must obtain approval from the Associate Administrator as prescribed in §178.74 of this subchapter. The repair of a MEGC's structural equipment is authorized provided such repairs are made in accordance with the requirements prescribed for its approved design and construction. Any repair to the pressure receptacles of a MEGC must meet the requirements of §180.212.

(e) *Requalification markings.* Each MEGC must be durably and legibly marked in English, with the year and month, and the type of the most recent periodic requalification performed (*e.g.* , 2004–05 AE/UE, where “AE” represents acoustic emission and “UE” represents ultrasonic examination) followed by the stamp of the approval agency who performed or witnessed the most recent test.

(f) *Records.* The owner of each MEGC or the owner's authorized agent must retain a written record of the date and results of all repairs and required inspections and tests. The report must contain the name and address of the person performing the inspection or test. The periodic test and inspection records must be retained until the next inspection or test is completed. Repair records and the initial exceptional inspection and test records must be retained during the period the MEGC is in service and for one year thereafter. These records must be made available for inspection by a representative of the Department on request.

[71 FR 33896, June 12, 2006]