



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

October 25, 2021

1200 New Jersey Avenue, SE
Washington, DC 20590

DOT-SP 10915
(TWENTY-FOURTH REVISION)

EXPIRATION DATE: 2025-08-31

(FOR RENEWAL, SEE 49 CFR 107.109)

1. GRANTEE: Luxfer Gas Cylinders
Riverside, CA
2. PURPOSE AND LIMITATIONS:
 - a. This special permit authorizes the manufacture, mark, sale and use of a non-DOT specification fully wrapped carbon-fiber reinforced aluminum lined cylinder for the transportation in commerce of the materials authorized by this special permit. This special permit provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein. The most recent revision supersedes all previous revisions.
 - b. The safety analyses performed in development of this special permit only considered the hazards and risks associated with transportation in commerce.
 - c. In accordance with 49 CFR 107.107(a) party status may not be granted to a manufacturing permit. These packagings may be used in accordance with 49 CFR 173.22a.
3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171- 180.
4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 172.203(a) and 172.301(c) in that the marking requirements are waived and §§ 173.302a(a)(1), 173.304a(a)(1), and 180.205 in that non-specification cylinders are not authorized, except as specified herein.
5. BASIS: This special permit is based on the application of Luxfer Gas Cylinders dated February 23, 2021, submitted in accordance with § 107.105 and the public preceding thereon.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Hazardous Materials Description			
Proper Shipping Name	Hazard Class/ Division	Identification Number	Packing Group
Air, compressed (<i>containing up to 39% by volume oxygen content</i>)	2.2	UN1002	N/A
Argon, compressed	2.2	UN1006	N/A
Carbon Dioxide	2.2	UN1013	N/A
Carbon monoxide, compressed	2.3	UN1016	N/A
Compressed gas, n.o.s.	2.2	UN1956	N/A
Compressed gas, oxidizing, and n.o.s.	2.2	UN3156	N/A
Helium, compressed	2.2	UN1046	N/A
Hydrogen and carbon monoxide mixture, compressed	2.3	UN2600	N/A
Hydrogen, compressed	2.1	UN1049	N/A
Krypton, compressed	2.2	UN1056	N/A
Liquefied gas, n.o.s.	2.2	UN3163	N/A
Methane, compressed <i>or</i> Natural gas, compressed (<i>with high methane content</i>)	2.1	UN1971	N/A
Neon, compressed	2.2	UN1065	N/A
Nitrogen, compressed	2.2	UN1066	N/A
Nitrous Oxide	2.2	UN1070	N/A
Oxygen, compressed	2.2	UN1072	N/A
Xenon, compressed	2.2	UN2036	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING: Packaging prescribed is a fully wrapped carbon-fiber reinforced aluminum lined cylinder manufactured and marked in conformance with Basic Requirements for Fully Wrapped Carbon-Fiber Reinforced Aluminum Lined Cylinders (DOT-CFFC Fifth Revision), dated March 2007, except as follows:

CFFC-2 – Type, Size and Service Pressure

* * *

The marked service pressure may not exceed 37,921kPa (5,500 psi) at a reference temperature of 21.1°C (70°F).

* * *

CFFC -6 – Authorized Material and Identification of Material

(b) Filament Materials

(i) Carbon fibers: * * *

The tensile strength may not exceed 6,205,282 kPa (900,000 psi), the modulus of elasticity may not exceed 300 million kPa (43.5 million psi), and the strain to failure may not be less than 1 percent.

* * *

CFFC-8(a) (iv) Threaded openings need not extend completely through the neck and may be designed to allow full engagement of mating threads.

b. REQUALIFICATION:

(1) Each cylinder must be requalified once every 5 years by a qualified person holding a valid DOT RIN using either:

- a. Hydraulic proof pressure test equal to 5/3 times the marked service pressure as defined in CGA Pamphlet C-1 Section 7 except the pressure shall be maintained for a minimum of 3 minutes or;
- b. Volumetrically tested to 5/3 times the marked service pressure by the water jacket method as defined in CGA Pamphlet C-1 Section 5, except that pressure shall be maintained for one minute and Permanent to Total Expansion ratio does not apply. Elastic expansion result shall not exceed the marked REE on the cylinder label.

(2) Each cylinder must visually be inspected in accordance with CGA Pamphlet C-6.2 Guidelines for Visual Inspection and Re-qualification of Fiber Reinforced High Pressure Cylinders, except as specifically noted herein:

- (i) Cylinders with fiber damage (cuts, abrasions, etc.) that exceeds Level 1 type damage as defined in CGA Pamphlet C-6.2 and meet the following depth and length criteria are considered to have Level 2

damage:

(A) Depth - Damage that upon visual inspection is seen to penetrate the outer fiberglass layer but does not expose the carbon layer beneath, or that has a measured depth of greater than 0.005 inch and less than 0.045 inch for cylinders with an outside diameter greater than 7.5 inches or less than 0.035 inch for cylinders 7.5 inches or less in outside diameter;

(B) Length - Damage that has a maximum allowable length of:

Region	Direction of fiber damage	Maximum length of damage
Cylinder sidewall and domes	Transverse to fiber direction (longitudinal direction)	20% of the straight sidewall section length
Cylinder sidewall and domes	In fiber direction (circumferential direction)	20% of the straight sidewall section length

(ii) Cylinders with damage that meet the Level 2 criteria must be rejected. Requalifiers must contact the cylinder manufacturer in the event that the damage cannot be clearly interpreted based on these criteria. Repair of rejected cylinders is authorized for Level 2 type damage. Repairs must be made in accordance with CGA Pamphlet C-6.2, prior to the hydrostatic pressure test. Repairs must be evaluated after the hydrostatic test.

(iii) Cylinders that have direct fiber damage that penetrates through the outer fiberglass layer and into the carbon layer, or that have a measured damage depth of greater than the Level 2 maximum are considered to have Level 3 type damage. Cylinders that have damage with depth meeting Level 2, but length exceeding the Level 2 maximum are considered to have Level 3 type damage. Cylinders with Level 3 type damage are not authorized to be repaired, and must be condemned.

(iv) A hydrostatic requalification may be repeated as provided in § 180.205(g); only two such tests are permitted. Pressurization prior to the official hydrostatic test for the purpose of a systems check may not exceed 85% of the minimum required test pressure.

(3) Persons who perform inspection and testing of cylinders subject to this special permit must comply with § 180.205(b) and with all the terms and conditions of this special permit.

(4) Requalification date (month/year) must be applied on a label securely affixed to the cylinder and over coated with epoxy, near the original test date. Metal stamping of the composite surface is prohibited. The marking of the RIN symbol on the cylinder certifies compliance with all of the terms and conditions of this special permit.

c. OPERATIONAL CONTROLS:

- (1) Cylinders manufactured under this special permit are not authorized for use fifteen (15) years after the date of manufacture.
- (2) Cylinders may not be used for underwater breathing purposes.
- (3) Cylinders used in oxygen service or in nitrous oxide service must conform with § 173.302(b)(1)-(3).
- (4) Cylinders used in Division 2.3 gas service such as carbon monoxide must be in dedicated service for dry gases and meet all requirements of §180.209(b)(ii).
- (5) Requalification of cylinders by hydraulic proof pressure in Division 2.3 gas service such as carbon monoxide must meet the following requirements:
 - (i) Water exposure and duration of the water in the cylinder must meet the requirement of CGA pamphlet C-22 to prevent liner pitting corrosion;
 - (ii) In addition to the visual inspection described in par 7.b of this special permit, a comprehensive internal visual in accordance with CGA pamphlet C6-2 must be performed to inspect for liner pitting. A cylinder with any indication of liner pitting corrosion must be rejected.
- (6) A cylinder that has been subjected to fire may not be returned to service.
- (7) Transportation of flammable gases is not authorized aboard passenger-carrying aircraft or cargo vessel.
- (8) Transportation of oxygen is only authorized when in accordance with § 175.501.
- (9) Cylinders must be packaged in accordance with § 173.301(a)(9).

8. SPECIAL PROVISIONS:

- a. In accordance with the provisions of Paragraph (b) of § 173.22a, persons may use the packaging authorized by this special permit for the transportation of the hazardous

materials specified in paragraph 6, only in conformance with the terms of this special permit.

- b. A person who is not a holder of this special permit, but receives a package covered by this special permit, may reoffer it for transportation provided no modifications or changes are made to the package and it is offered for transportation in conformance with this special permit and the HMR.
 - c. A current copy of this special permit must be maintained at each facility where the package is offered or reoffered for transportation.
 - d. A current copy of this special permit must be maintained at each facility where the packaging is manufactured under this special permit. It must be made available to a DOT representative upon request.
 - e. Each packaging manufactured under the authority of this special permit must be either (1) marked with the name of the manufacturer and location (city and state) of the facility at which it is manufactured or (2) marked with a registration symbol designated for a specific manufacturing facility.
 - f. The cylinders described in this special permit are authorized only for normal transportation as an article of commerce i.e., the movement of hazardous materials packages from consignor to consignee.
 - g. The requirements to mark shipping papers and packages with the special permit number in accordance with §§ 172.203(a) and 172.301(c), respectively, are waived.
9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel, cargo-only aircraft, and passenger-carrying aircraft (see paragraphs 7.c.(7) and 7.c.(8) for restrictions).
 10. MODAL REQUIREMENTS: None required by this special permit.
 11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this special permit and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:
 - o All terms and conditions prescribed in this special permit and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
 - o Persons operating under the terms of this special permit must comply with the security plan requirement in Subpart I of Part 172 of the HMR, when applicable.
 - o Registration required by § 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this

special permit must receive training on the requirements and conditions of this special permit in addition to the training required by §§ 172.700 through 172.704.

No person may use or apply this special permit, including display of its number, when this special permit has expired or is otherwise no longer in effect.

Under Title VII of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)—“The Hazardous Materials Safety and Security Reauthorization Act of 2005” (Pub. L. 109-59), 119 Stat. 1144 (August 10, 2005), amended the Federal hazardous materials transportation law by changing the term “exemption” to “special permit” and authorizes a special permit to be granted up to two years for new special permits and up to four years for renewals.

12. **REPORTING REQUIREMENTS:** Shipments or operations conducted under this special permit are subject to the Hazardous Materials Incident Reporting requirements specified in 49 CFR §§ 171.15 Immediate notice of certain hazardous materials incidents, and 171.16 Detailed hazardous materials incident reports. In addition, the grantee(s) of this special permit must notify the Associate Administrator for Hazardous Materials Safety, in writing, of any incident involving a package, shipment or operation conducted under terms of this special permit.

Issued in Washington, D.C.:



for William Schoonover
Associate Administrator for Hazardous Materials Safety

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, East Building PHH-30, 1200 New Jersey Avenue, Southeast, Washington, D.C. 20590.

Copies of this special permit may be obtained by accessing the Hazardous Materials Safety Homepage at <https://www.phmsa.dot.gov/approvals-and-permits/hazmat/special-permits-search>. Photo reproductions and legible reductions of this special permit are permitted. Any alteration of this special permit is prohibited.

PO: Mark Toughiry/AE