



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

October 26, 2021

1200 New Jersey Avenue, SE
Washington, DC 20590

DOT-SP 10970
(THIRTEENTH REVISION)

EXPIRATION DATE: 2025-08-31

(FOR RENEWAL, SEE 49 CFR 107.109)

1. GRANTEE: Luxfer Gas Cylinders
Riverside, CA
2. PURPOSE AND LIMITATION:
 - a. This special permit authorizes the manufacture, marking, sale and use of non-DOT specification fiber reinforced plastic (FRP) full composite (FC) cylinders for the transportation in commerce of certain compressed gases, and 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 § 107.107(a) party status may not be granted to a manufacturing permit. These packagings may be used in accordance with § 173.22a.
3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.
4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 173.302a(a)(1), 173.304a(a) and (d) in that a non-DOT specification cylinder is not authorized, except as specified herein.
5. BASIS: This special permit is based on the application of Luxfer Gas Cylinders dated September 30, 2021, submitted in accordance with § 107.123.

6. HAZARDOUS MATERIALS (49 CFR 172.101):

Hazardous Materials Description			
Proper Shipping Name	Hazard Class/ Division	Identification Number	Packing Group
Air compressed (containing up to 39% by volume oxygen)	2.2	UN 1002	N/A
Argon, compressed	2.2	UN1006	N/A
Bromotrifluoromethane, R13B1	2.2	UN1009	N/A
Carbon dioxide	2.2	UN 1013	N/A
Compressed gas, n.o.s.	2.2	UN1956	N/A
Helium, compressed	2.2	UN 1046	N/A
Methane, compressed <i>or</i> Natural gas, compressed (<i>with high methane content</i>)	2.1	UN 1971	N/A
Nitrogen, compressed	2.2	UN 1066	N/A
Oxygen, compressed	2.2	UN 1072	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING: Prescribed packaging is a non-DOT specification fiber reinforced plastic (FRP) full composite (FC) aluminum cylinder made in conformance with the following:

(1) Luxfer USA's design drawing C-1060-30T69-A4A dated 6-33-92, and the report of Design Qualification Tests contained on file with the Office of Hazardous Materials Special Permits and Approvals (OHMSPA), and

(2) DOT FRP-1 Standard, Revision 2, dated February 15, 1987, (§ 178.AA), except as follows:

§ 178.AA-2 Type, size and service pressure.

Type 3FC cylinder consisting of resin impregnated continuous filament windings in helical and circumferential directions over a seamless aluminum liner made in compliance with § 178.AA-6; not over 200 pounds

water capacity; and a service pressure of at least 900 psi but not greater than 5000 psi.

§ 178.AA-4 Duties of the Inspector.

(a) Verify conformance to the requirements in this special permit and to DOT FRP-1 Standard Revision 2, dated February 15, 1987.

(b) Verify conformance of aluminum liner with § 178.AA-6. Verify conformance of the filament and resin system components with the requirements specified in § 178.AA-5 of this special permit.

(c) thru (g) * * *.

§ 178.AA-5 Authorized Materials and Identification of materials.

(a) Aluminum liner must be 6061 alloy of T6 temper made from seamless drawn tubing.

(b) Filament material must be Kevlar 49TM-8520 Denier, and glass hybrid construction. The filaments must be tested in accordance with ASTM-D2343-67(85) for strand strength and must have strand strength of 400,000 psi minimum.

For roving denier determination, the filament material must be tested in accordance with ASTM D3317-74 and must be of at least 90% of the specified nominal value for the rovings. A manufacturer's certified test results for the rovings used in production may be used in lieu of testing.

(c) thru (e) * * *

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 minutesor;
- 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.

(2) Visual Inspection: Each cylinder must be visually 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. Retesters 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) The requalification date (month/year) must be permanently marked on the cylinder. Retest dates must be stamped on the exposed metallic surface of the cylinder neck or marked on a label securely affixed to the cylinder and overcoated with epoxy near the original test date. Reheat treatment or repair of rejected cylinders is not authorized. The marking of the RIN symbol on the cylinder certifies compliance with all of the terms and conditions of this special permit.

c. MARKING: Each cylinder must be marked as prescribed in § 178.AA-15

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 modification or change is 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. Each packaging manufactured under the authority of this special permit must be marked with the registration symbol designated by the Office of Hazardous Materials Special Permits and Approvals for a specific manufacturing facility.

e. A current copy of this special permit must be maintained at each facility where the package is manufactured under this special permit. It must be made available to a DOT representative upon request.

f. Cylinders may not be used for underwater breathing purposes.

g. Cylinders used in oxygen service must conform with § 173.302(b)(1) through (4).

h. Cylinder service life may not exceed 15 years from the date of manufacture as marked on the cylinder.

i. No person may perform inspection and testing of cylinders subject to this special permit unless that person (1) holds a current copy of this special permit at the location of such inspection and testing, and (2) complies with all the terms and conditions of this

special permit. The marking of the retester's symbol on the cylinders certifies compliance with all of the terms and conditions of this special permit.

- j. A cylinder that has been subjected to fire may not be returned to service.
 - k. Transportation of flammable gases is not authorized aboard cargo vessel or aircraft.
 - l. Transportation of oxygen is only authorized when in accordance with § 175.501.
 - m. Cylinders must be packaged in accordance with § 173.301(a)(9).
 - n. A current copy of this special permit, in its current status, must be maintained at each manufacturing facility at which this packaging is manufactured and must be made available to a DOT representative upon request.
 - o. 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.
 - p. Filling requirements are subject to all terms contained in § 173.302a for DOT Specification 3AL cylinders.
9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel, passenger-carrying aircraft, and cargo-aircraft only. (See paragraphs 8.(k) and 8.(l) of this special permit).
10. MODAL REQUIREMENTS: A current copy of this special permit must be carried aboard each cargo vessel or aircraft used to transport packages covered by this special permit. The shipper must furnish a current copy of this special permit to the air carrier before or at the time the shipment is tendered.
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, 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 the special permit has expired or it 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, Department of Transportation, Washington, D.C. 20590. Attention: PHH-31.

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: MT/TG