

August 26, 2020



U.S. Department
of Transportation

East Building, PHH-30
1200 New Jersey Avenue S.E.
Washington, D.C. 20590

**Pipeline and Hazardous
Materials Safety Administration**

DOT-SP 15136
(FIFTH REVISION)

EXPIRATION DATE: 2024-07-31

(FOR RENEWAL, SEE 49 CFR 107.109)

1. GRANTEE: Luxfer Inc.
dba Luxfer Gas Cylinders
Riverside, CA
2. PURPOSE AND LIMITATIONS:
 - a. This special permit authorizes the manufacture, mark, sale, and use of non-DOT specification fully-wrapped carbon fiber composite gas cylinder with a seamless aluminum liner that meets all requirements of ISO 11119 part 2, except as specified in paragraph 7.a. 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. The safety analyses did not consider the hazards and risks associated with consumer use, use as a component of a transport vehicle or other device, or other uses not 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.

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4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 173.302(a)(1) and 173.304(a) in that the use of non-DOT specification or UN cylinders is not authorized, except as specified herein.
5. BASIS: This special permit is based on the application of Luxfer Inc. dba Luxfer Gas Cylinders dated August 6, 2020, submitted in accordance with § 107.109.
6. HAZARDOUS MATERIALS (49 CFR 172.101):

Hazardous Material Description			
Proper Shipping Name	Hazard Class/ Division	Identification Number	Packing Group
Air compressed (containing up to 39% by volume oxygen)	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, flammable, n.o.s.	2.1	UN1954	N/A
Compressed gas, oxidizing, n.o.s.	2.2	UN3156	N/A
Helium, compressed	2.2	UN1046	N/A
Hydrocarbon gas mixture, compressed, n.o.s.	2.1	UN1964	N/A
Hydrogen, compressed	2.1	UN1049	N/A
Krypton, compressed	2.2	UN1056	N/A
Methane, compressed or Natural gas, compressed (<i>with high methane content</i>)	2.1	UN1971	N/A
Neon, compressed	2.2	UN1065	N/A

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Hazardous Material Description			
Proper Shipping Name	Hazard Class/ Division	Identification Number	Packing Group
Nitrogen, compressed	2.2	UN1066	N/A
Nitrous oxide, compressed	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 non-DOT specification fully wrapped fiber reinforced composite gas cylinder with aluminum alloy 6061-T6 liner as described in the grantee's application on file with the Office of Hazardous Materials Safety Approvals and Special Permits Division (OHMSASPD). Each cylinder must meet the design and construction requirements for UN composite cylinders specified in § 178.71(1)(ii) and of ISO Standard 11119-2 (Gas Cylinders of Composite Construction-Specification and Test Methods - Part 2: (Fully wrapped fiber reinforced composite gas cylinders with load-sharing metal liners), except as follows:

(1) Cylinders manufactured under this special permit are limited to:

(i) Maximum service pressure of 379 bar (5,500 psig), if the water volume is less than or equal to 10 liters; or

(ii) Maximum service pressure of 248 bar (3,600 psig), if the water volume is greater than 10 liters and less than or equal to 325 liters.

(2) All design qualification and batch inspection and testing must be performed in accordance with the ISO 11119-2 standard. The ambient hydraulic cycle test must withstand the pressurization cycles required for at least 15-year service life. That is the cylinder must withstand, without failure by burst or leakage, 3,750 pressure reversal cycles at the hydraulic test

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pressure or 7,500 cycles corresponding to the maximum developed pressure at 65 °C for the intended gas service.

b. MARKING:

(1) Each cylinder must be permanently marked (other than by stamping) in the composite on the sidewall. The marking must be easily visible and must be protected from external damage due to the environment and handling.

(2) The marking must contain the following:

(i) DOT special permit number (DOT-SP 15136) followed by service pressure expressed in bar (psi).

(ii) A serial number and the manufacturer's identification number or a symbol issued by the Associate Administrator for Hazardous Materials Safety located just below or immediately following the special permit marking above.

(iii) The DOT inspector's official marking must be placed near the serial number. The marking must contain the date (month and year) of the initial hydraulic proof pressure test for that cylinder.

(iv) The size of the letters and numbers used must be at least 0.64 cm (1/4 inch) high if space permits.

(v) The following are examples of an authorized format for marking:

DOT-SP 15136-379 bar (5,500psi)

1234-MMI (or symbol)

II-MM/YY

(vi) Additional markings are permitted in the composite provided the additional markings do not obscure the required marking and are not detrimental to the integrity of the cylinder.

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(vii) Provisions for marking of the required requalification dates and RIN information must be made near the cylinder markings.

c. REQUALIFICATION:

(1) Each cylinder must be requalified once every 5 years by a qualified person holding a valid DOT RIN using a hydraulic proof pressure test equal to 1.5 times the marked service pressure. The pressure must be held for a minimum of 3 minutes without a loss of pressure. The test equipment must conform to the accuracy requirement of § 180.205(g). The hydraulic proof pressure test may be substituted by a pneumatic proof pressure test subject to the following conditions:

(i) The testing facility is prepared and approved for proof pressure test based on a documented risk assessment and failure mode and effects analysis.

(ii) Each cylinder is pressurized to 1.25 times the marked service pressure. The pressure must be held for 10 consecutive minutes. The loss of pressure during the hold time must not exceed 5% of the original test pressure.

(iii) In case of equipment failure during the test which results in loss of pressure prior to the completion of the 10-minute hold time, the test may only be repeated one time at a pressure of 1.27 times the marked service pressure.

(iv) A cylinder that fails to maintain the test pressure must be evaluated to determine the cause. A cylinder that shows evidence of damage (surface distortion, unraveled fibers, or other evidence of weakness) must be evaluated in accordance with the visual inspection procedure described in this special permit.

(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:

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(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 if 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.

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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.

(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 permanently marked on the cylinder as specified in paragraph § 180.213. The marking of the RIN symbol on the cylinder certifies compliance with all the terms and conditions of this special permit.

d. OPERATIONAL CONTROLS:

(1) Cylinders manufactured under this special permit are authorized for a maximum service use of 15 years from the date of manufacture.

(2) Cylinders may not be used for underwater breathing purposes.

(3) Cylinders used in oxygen service must conform with § 173.302(b).

(4) Cylinders used in nitrous oxide service must conform with § 173.304a(a).

(5) A cylinder that has been subjected to fire may not be returned to service.

(6) Manifolding of cylinders must be in accordance with the requirements of §173.301(g).

(7) Transportation of Division 2.1 (flammable gas) hazardous materials is not authorized aboard cargo vessel and aircraft unless specifically authorized in the Hazardous Materials Table (§ 172.101).

(8) Transportation of oxygen is only authorized aboard aircraft when in accordance with § 175.501.

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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 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 by the Office of Hazardous Materials Safety Approvals and Permits Division for a specific manufacturing facility.

e. 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.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel, passenger-carrying aircraft, and cargo-only aircraft.

10. MODAL REQUIREMENTS: A current copy of this special permit must be carried aboard each cargo vessel, aircraft, and motor vehicle used to transport packages covered by this special permit. The shipper must furnish a copy of this special permit to the air carrier before or at the time the shipment is tendered.

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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

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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 http://hazmat.dot.gov/sp_app/special_permits/spec_perm_index.htm
Photo reproductions and legible reductions of this special permit are permitted. Any alteration of this special permit is prohibited.

PO: RS/NICKS