U.S. Department
of Transportation
**Research and
Special Programs
Administration**

400 Seventh St., S.W.
Washington, D.C. 20590

DEC 2 0 2002

DOT-E 12479
(FIRST REVISION)

| EXPIRATION DATE: November 30, 2004 |
|---|

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Luxfer Gas Cylinders
Riverside, CA

2. PURPOSE AND LIMITATIONS:

a. This exemption authorizes the manufacture, mark, sale and use of non-DOT specification fiberglass hoop wrapped cylinders for the transportation in commerce of the materials authorized by this exemption. The cylinders are authorized for self contained underwater breathing apparatus (SCUBA) use. This exemption provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein.

b. The safety analyses performed in development of this exemption 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.

3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 173.302a(a)(1) and 175.3 in that a non-DOT specification cylinder is not authorized, except as specified herein.

5. BASIS: This exemption is based on the application of Luxfer Gas Cylinders dated November 26, 2002 submitted in accordance with § 107.109.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

| Proper Shipping Name/ Hazardous Material Description | Hazard Class/ Division | Identi-fication Number | Packing Group |
|---|---|---|---|
| Air, compressed * | 2.2 | UN1002 | N/A |
| Compressed gas, n.o.s. * | 2.2 | UN1956 | N/A |

* Only gases used exclusively for SCUBA service are authorized.

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Prescribed packaging is a non-DOT specification hoop wrapped (HW) fiber reinforced plastic (FRP) cylinder made in accordance with the following:

(1) Luxfer Gas Cylinder's technical data related to their design models S106W and S85W and Luxfer drawings on file with the Office of Hazardous Materials Exemption and Approvals (OHMEA),

(2) DOT FRP-2 Standard (§ 178.BB) Revision 1 dated January 4, 1987, except as follows:

§ 178.BB-5 Material.

(a) Aluminum liner must be 6061 alloy and T6 temper.

(b) * * *

(c) Resin type must be Shell Epon 826.

* * * * *

§ 178.BB-6 Manufacture.

(a) Liner. Aluminum liner without over-wrap must be designed for a service pressure of at least 67% of the service pressure marked on the completed composite cylinder.

§ 178.BB-7 Wall thickness.

* * * * *

(b) The maximum filament stress at service pressure may not exceed 30 percent of the filament stress at the virgin burst pressure of the lot test cylinder.

* * * * *

§ 178.BB-10 Pressure relief devices and protection for valves, relief devices, and other connections.

Pressure relief devices and protection for valves and other connections must conform with §§ 173.301(f) and 173.301(h), except that the adequacy of the pressure relief devices for each design may be verified in accordance with § 178.BB-18(g). The pressure relief device must be set at the cylinder test pressure with a tolerance of plus 0% and minus 10%.

§ 178.BB-15 Marking.

(a) * * *

(b) Required markings are as follows:

(1) "DOT-E 12479" followed by the service pressure in psig.

* * * * *

<u>Add</u> (6)Rejection elastic expansion (REE) marking in cubic centimeters. The REE for each design type cylinder is obtained as follows:

(i) Perform hydrostatic testing on a lot of cylinders and record elastic expansion (EE) of each cylinder.

(ii) Find the mean value of the EE for all cylinders tested in item 1.

(iii) Mark each cylinder with REE which is equal to 10% above the mean value obtained in item ii. The REE marking must follow the date of test.

Add (7) "AUTHORIZED FOR SCUBA USE"; and "END OF SERVICE LIFE MM YY" where MM YY is the month and year 15 years after the manufacture date.

(c) through (e) * * *

b. REQUALIFICATION -

(1) Each cylinder must be given an annual visual inspection by properly trained, Professional Scuba Inspectors, Inc. (PSI) certified personnel. Cylinders that do not pass the annual visual inspection must be rejected and returned to Luxfer. Luxfer must annually submit a report of all failed cylinders to the OHMEA. The report must include the cylinder serial number and date of manufacture. The report must include a description of cuts, abrasions, and other damage detected during visual inspection.

(2) Each cylinder must be reinspected and hydrostatically retested at least every three years in a water jacket suitable for the determination of the expansion of the cylinder. The hydrostatic test must be conducted in accordance with the procedures in § 180.205(g) except that the test pressure must be maintained for a minimum of 60 seconds and as much longer as may be necessary to ensure stable volumetric expansion. The elastic and total volumetric expansions must be determined. Reheat treatment or repair of rejected cylinders is not authorized. A cylinder must be condemned if the elastic expansion exceeds the marked rejection elastic expansion.

(3) Each time a cylinder is retested, it must be visually inspected internally and externally in accordance with the terms of CGA Pamphlet C-6.1 and C-6.2. The cylinder must be approved, rejected, or condemned according to the criteria set forth in the applicable CGA pamphlet.

(4) When a hydrostatic retest is repeated as authorized by § 180.205(g)(5), only two such retests are permitted.

(5) 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.

(6) Persons who perform inspection and testing of cylinders subject to this exemption must comply with § 180.205(b) and with all the terms and conditions of this exemption. The marking of the retester's symbol on the cylinders certifies compliance with all of the terms and conditions of this exemption.

c. OPERATIONAL CONTROLS -

(1) Cylinders are authorized for underwater use only.

(2) Annual production is limited to three thousand (3000) of each of the two authorized cylinder designs, S106W and S85W. Complete identification and serial number of these cylinders must be submitted to the OHMEA.

(3) Cylinders charged with oxygen must be transported in accordance with §§ 173.302a(b)(5)(1) through (b)(5)(4).

(4) Filling requirements are subject to all terms contained in § 173.302a for 3AL Specification cylinders.

(5) Cylinders must be packaged in accordance with § 173.301(a)(9).

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

(7) A cylinder is not authorized for use 15 years after the date of manufacture. After 15 years of service, the cylinder must be rendered incapable of holding pressure.

(8) Luxfer must carry out an in-service test and evaluation plan as follows:

(i) Luxfer must sample cylinders from those manufactured during the first two years of production. Sampling and testing must be as summarized in the table below. Cylinders must be given a requalification in accordance with paragraph 7(b)(2) thru (6) of this exemption. Each cylinder must then be given a hydrostatic burst test in accordance with the requirements of DOT FRP-2 § 178.BB-12(b).

| FROM PRODUCTION YEAR | SAMPLE GROUP NUMBER | YEARS IN SERVICE | TEST YEAR | MINIMUM SAMPLE SIZE PER DESIGN |
|---|---|---|---|---|
| 1 | 1 | 6 | 6 | 15 |
| 2 | 2 | 6 | 7 | 15 |
| 1 | 3 | 9 | 9 | 15 |
| 2 | 4 | 9 | 10 | 15 |
| 1 | 5 | 12 | 12 | 15 |
| 2 | 6 | 12 | 13 | 15 |

(ii) Luxfer must submit a report of the inspection and test results from sample group number one to the OHMEA upon completion. Reports of subsequent sample group testing must be submitted every three years. Each report must include the cylinder serial number and date of manufacture. The report must include a description of cuts, abrasions, and other damage detected during visual examination. The report must include notation of total and elastic expansion measured during the hydrostatic test. The report must include the failure mode, and burst pressure of the cylinder.

8. SPECIAL PROVISIONS:

a. Transportation of oxygen is only authorized when in accordance with § 172.102(c)(2) Special Provision A52 and §§ 175.85(h) and (i).

b. In accordance with the provisions of Paragraph (b) of § 173.22a, persons may use the packaging authorized by this exemption for the transportation of the hazardous materials specified in paragraph 6, only in conformance with the terms of this exemption.

c. A person who is not a holder of this exemption, but receives a package covered by this exemption, may reoffer it for transportation provided no modification or change is made to the package or its contents and it is offered for transportation in conformance with this exemption and the HMR.

d. A current copy of this exemption must be maintained at each facility where the package is offered or reoffered for transportation.

e. Each packaging manufactured under the authority of this exemption 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 Exemptions and Approvals for a specific manufacturing facility.

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

g. The cylinders described in this exemption are authorized only for normal transportation as an article of commerce; i.e., the movement of hazardous materials packages from consignor to consignee.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel, cargo aircraft only, and passenger-carrying aircraft (see paragraph 8.a for restrictions).

10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each cargo vessel and aircraft used to transport packages covered by this exemption. The shipper must furnish a copy of this exemption 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 exemption and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:

- All terms and conditions prescribed in this exemption and the Hazardous Materials Regulations, Parts 171-180.
- Registration required by § 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this exemption must receive training on the requirements and conditions of this exemption in addition to the training required by §§ 172.700 through 172.704.

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

12. REPORTING REQUIREMENTS: The carrier is required to report any incident involving loss of packaging contents or packaging failure to the Associate Administrator for Hazardous Materials Safety (AAHMS) as soon as practicable. (Sections 171.15 and 171.16 apply to any activity undertaken under the authority of this exemption.) In addition, the holder(s) of this exemption must also inform the AAHMS, in writing, as soon as practicable of any incidents involving the package and shipments made under this exemption.

Issued in Washington, D.C.

for Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety

DEC 20 2002
(DATE)

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Research and Special Programs Administration, Department of Transportation, Washington, D.C. 20590. Attention: DHM-31.

Copies of this exemption may be obtained by accessing the Hazardous Materials Safety Homepage at http://hazmat.dot.gov/exemptions Photo reproductions and legible reductions of this exemption are permitted. Any alteration of this exemption is prohibited.

PO: CWFREEMAN/alb