U.S. Department
of Transportation

**Research and
Special Programs
Administration**

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

AUG 30 2001

DOT-E 11382
(FOURTH REVISION)

EXPIRATION DATE: July 31, 2003

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Structural Composites Industries
Pomona, CA

2. PURPOSE AND LIMITATIONS:

a. This exemption authorizes the manufacture, mark, sale and use of non-DOT specification fiber reinforced plastic (FRP) hoop wrapped cylinders to be used for the transportation in commerce of the materials listed in paragraph 6 below. 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.

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

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 173.34(e), 173.302(a)(1), 173.304(a)(1) and 175.3 in that non-DOT specification cylinders are not authorized, except as specified herein.

5. BASIS: This exemption is based on the application of Structural Composite Industries dated July 30, 2001, submitted in accordance with § 107.109.

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6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Proper Shipping Name/ Hazardous Materials Description	**Hazard Class/ Division**	**Identi-fication 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, compressed	2.2	UN1013	N/A
Helium, compressed	2.2	UN1046	N/A
Methane, compressed *or* Natural gas, compressed (*with high Methane content*)	2.1	UN1971	N/A
Nitrogen, compressed	2.2	UN1066	N/A
Oxygen, compressed	2.2	UN1072	N/A

7. SAFETY CONTROL MEASURES:

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

(1) Structural Composite Industries' drawing number 1272582, dated December 16, 1994; the information provided in the Report of Design Qualification Testing, dated October 26, 1994, on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA), and

(2) DOT FRP-2 Standard (§ 178.BB), Revision 1 dated January 4, 1987, contained in Appendix A of this exemption, except as follows:

§ 178.BB-1 Compliance.

Cylinders authorized under this exemption must be in compliance with the basic and specific requirements prescribed in this exemption. Design qualification test results must be on file with the OHMEA at least 30 days prior to shipment of the first lot for each cylinder design meeting the definition of design change in § 178.BB-18.

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

Type 3HW composite cylinder consisting of resin impregnated continuous filament windings in circumferential or near circumferential directions over a seamless aluminum liner made in compliance with § 178.BB-6(a), not over 100 pounds water capacity, and a service pressure not less than 900 psi and not greater than 2220 psi.

§ 178.BB-4 Duties of the Inspector.

(a) Verify conformance with the requirements of this exemption and with DOT FRP-2 Standard dated January 15, 1982.

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

(c) thru (g) * * *

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

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

(b) thru (e) * * *

§ 178.BB-6 Manufacture:

(a) * * *

(1) and (2) * * *

(3) Starting material is sheet, or plate traceable to cast stock by cast code number, and manufacturer, or seamless tubing formed by the die and mandrel method from cut billets as described in SCI's letter dated May 25, 1983 (enclosure 3) on file with the OHMEA.

(4) Ultrasonic inspection of sheet or plate stock is not required. Inspection of cast hollow ingot must be as described in the application (enclosure 3).

(5) Cylinder shells must be manufactured by deep drawing or by drawing and ironing the sheet or plate without external heating of the material or by extrusion of cut billets in accordance with the methods described in the application. Spun closures are not authorized. Cylinders may be designed with plugged spun base. Plugging to correct manufacturing defects is not permitted. End contour must be hemispherical or ellipsoidal with ratio of major to minor axis not exceeding two to one with concave side to pressure.

(b) thru (e) * * *

§ 178.BB-12 Destructive tests:

(a) Cycling tests:

(1) One cylinder taken at random out of each lot of 200 cylinders must be subjected to cycling pressurization test by hydrostatically pressurizing the cylinder between approximately zero psig and the designated pressure at a rate not to exceed 10 cycles per minute. Adequate recording instrumentation must be provided if equipment is to be left unattended for period of time. All cylinders used in the cycling test must be destroyed.

(c) * * *

§178.BB-18 Design qualification tests.

(a) thru (c) * * *

(d) Pressure cycling test. All pressure cycling tests will be performed by hydrostatically pressurizing the test cylinder between approximately zero psig and the designated pressure at a rate not exceeding 10 cycles per minute. All cylinders used in cycle tests must be destroyed. Adequate recording instrumentation must be provided if equipment is to be left unattended for periods of time.

(d)(1) thru (d)(3) * * *

(e) thru (h) * * *

b. SAFETY CONTROL MEASURES -

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

(2) Cylinders used in oxygen service must conform with § 173.302(a)(5)(i) through (a)(5)(iv).

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

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

(5) Transportation of methane by cargo aircraft only is limited to 150 kilograms (330 pounds net quantity limitation per cylinder).

(6) Cylinders must be packaged in accordance with § 173.301(k).

(7) 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. No cylinder may be transported in a partially filled condition other than full or empty per § 173.29, unless it is equipped with a pressure relief device designed, manufactured and tested for partially filled cylinders.

(8) Filling requirements are subject to all terms contained in § 173.302 for 3AL specification cylinders.

c. MARKING - Compliance with § 178.BB-15 is required.

d. TESTING - Each cylinder must be reinspected and hydrostatically retested every three years in accordance with § 173.34(e)(13), as prescribed for DOT 3HT specification cylinders, except that the rejection elastic expansion does not apply and the permanent volumetric expansion may not exceed 5 percent of the total volumetric expansion at test pressure. 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. When a hydrostatic retest is repeated as provided for in § 173.34(e)(3), only two such retests are permitted.

8. SPECIAL PROVISIONS:

a. 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.

b. 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 modifications or changes are made to the package and it is offered for transportation in conformance with this exemption and the HMR.

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

d. Each packaging manufactured under the authority of this exemption must be marked with a registration symbol designated by the Office of Hazardous Materials Exemptions and Approvals for a specific manufacturing facility.

e. 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.

f. Transportation of flammable gases is not authorized aboard passenger-carrying aircraft or cargo vessel.

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

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel, cargo aircraft only, and passenger-carrying aircraft. (See paragraph 7.b.(5), 8.f. and g. of this exemption.)

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 current 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:

- o All terms and conditions prescribed in this exemption and the Hazardous Materials Regulations, Parts 171-180.

- 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 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 the 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.

R. Ryan Fisher

for Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety

AUG 30 2001
(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.

The original of this exemption is on file at the above office. Photo reproductions and legible reductions of this exemption are permitted. Any alteration of this exemption is prohibited.

PO: CWF/alb