



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

400 Seventh St., S.W.
Washington, D.C. 20590
OCT 17 2003

DOT-E 8162
(FOURTEENTH REVISION)

EXPIRATION DATE: September 30, 2005

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Structural Composites Industries
Pomona, California
2. PURPOSE AND LIMITATIONS:
 - a. This exemption authorizes the manufacture, mark, sale and use of non-DOT specification fiber reinforced plastic cylinders conforming with all regulations applicable to the DOT specification FRP-1 Standard, except as specified herein, for use as an equipment component aboard aircraft and marine craft. 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), 173.304a(a)(1) and 175.3 that non-specification cylinders are not authorized, except as specified herein.
5. BASIS: This exemption is based on the application of Structural Composites Industries, dated September 30, 2003 submitted in accordance with § 107.109.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Hazardous Materials Description			
Proper Shipping Name	Hazard Class/ Division	Identification Number	Packing Group
Air, compressed	2.2	UN1002	N/A
Argon, compressed	2.2	UN1006	N/A
Bromotrifluoromethane, R13B1	2.2	UN1009	N/A
Carbon dioxide	2.2	UN1013	N/A
Compressed gas, n.o.s.	2.2	UN1956	N/A
Helium, compressed	2.2	UN1046	N/A
Nitrogen, compressed	2.2	UN1066	N/A
Oxygen, compressed	2.2	UN1072	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Packaging prescribed is a non-DOT specification fiber reinforced plastic (FRP) full composite (FC) cylinder in full compliance with SCI Report 76188 on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA) and with DOT FRP-1 Standard Revision 2 (178.AA) dated February 15, 1987, except as follows:

§ 178.AA-4 Duties of Inspector.

* * *

(b) Add an additional sentence which reads: In lieu of testing for filament material properties by the exemption holder, a certificate by the filament manufacturer is acceptable provided that the procurement document specifies strength and quality requirements and that the supplied material is certified to those requirements.

§ 178.AA-5 Authorized material and identification of material.

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

(b) Filament material must be Kevlar 49 in compliance

with proposed aerospace materials specification (AMS) 3901. Filament must be tested in accordance with ASTM D 2343 for strand strength, and ASTM D 3317 for Denier.

(1) Strand strength must be 450,000 psig minimum.

(2) Denier must be at least 90 percent of the nominal value specified in AMS 3901. Denier of roving may be certified by the filament manufacturer.

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

(a) Pressure relief devices and protection for valves and other connections must be in compliance with §§ 180.205, 173.301(g), and 178.AA-18(g) of this exemption. However, only § 178.AA-18(g) may be used as the measure of relief device adequacy.

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§ 178.AA-12 Destructive tests.

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(b) Applies except that the rate of cycling may not exceed 10 cycles per minute.

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§ 178.AA-13 Acceptable results of tests.

(a) thru (c) * * *

(d) Burst test.

(1) Burst pressure shall be at least 3 times the service pressure and in no case less than the value necessary to meet the stress criteria of 178.AA-7(b). Failure must initiate in the cylinder sidewall. Cylinders with marked service pressure not exceeding 2200 psi containing liquefied gas must remain in one piece. Actual burst pressure must be recorded.

§ 178.AA-18 Design qualification tests.

(a) thru (c) * * *

(d) Applies except that the rate of cycling may not exceed 10 cycles per minute.

(e) * * *

(1) * * *

(2) Burst pressure must be at least 3 times the service pressure and in no case less than the value necessary to meet the stress criteria of 178.AA-7(b). Failure must initiate in the sidewall. Cylinders with marked service pressure not exceeding 2200 psi containing liquefied gas must remain in one piece. Actual burst pressure must be recorded.

(f) Gunfire test. One representative cylinder charged with air or nitrogen to service pressure shall be impacted by a 0.30 caliber armor piercing projectile having a velocity of approximately 2800 feet per second. Cylinders shall be so positioned that projectile impact point is in the bottom cylinder wall aimed to exit at cylinder sidewall, or impact point is on the cylinder sidewall at a 90° angle to the cylinder sidewall axis. Distance from firing location to test cylinder not to exceed 50 yards. Tested cylinder shall reveal no evidence of fragmentation failure. Any tear beyond 3 inches from the entrance or exit hole is cause for rejection. Approximate size of entrance and exit openings must be recorded.

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b. TESTING - Each cylinder must be reinspected and hydrostatically retested every three years in accordance with § 180.205 as prescribed for DOT 3HT cylinders, except that the rejection elastic expansion criterion does not apply, and permanent volumetric expansion must not exceed 5 percent of total volumetric expansion at test pressure. Retest dates must be steel stamped on the outer exposed metallic surface of the cylinder neck, or marked on a label securely affixed to the cylinder and overcoated with epoxy. Reheat treatment or repair of rejected cylinders not authorized.

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 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.

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. No cylinder is authorized 15 years after the date of manufacture.

g. Cylinders are authorized only for use as equipment components aboard aircraft or marine craft specifically identified to the OHMEA.

h. Cylinder must be packaged in accordance with § 173.301(a)(9).

i. Cylinders subjected to action of fire may not be placed in service.

j. Cylinders used in oxygen service must be in compliance with §§ 173.302a(a)(5)(i) thru (a)(5)(iv).

k. Transportation of oxygen is only authorized by aircraft 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 8.k. for restrictions).
10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each cargo vessel or 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:
- 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 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.



ra Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety

OCT 17 2003

(DATE)

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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: KFW/AM