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

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

FEB 1 4 2003

DOT-E 13172

EXPIRATION DATE: January 31, 2005

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Raytheon Integrated Defense Systems
Tewksbury, MA

2. PURPOSE AND LIMITATION:

a. This exemption authorizes the transportation in commerce of Helium, compressed in certain non-DOT specification fully wrapped carbon-fiber reinforced aluminum lined cylinders which are manifolded and permanently mounted in a protective frame. The cylinders are for use in support of the Airborne Command Element (ACE) First Responder Homeland Defense System. 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 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 § 172.101 Table, Column (9B) in that the quantity limitation for cargo aircraft only is exceeded; and §§ 173.302(a), 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 Raytheon dated October 31, 2002 and additional information dated February 10 and 12, 2003 submitted in accordance with § 107.105 and the public proceeding thereon.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

| Hazardous Materials Description | | | |
|---|---|---|---|
| **Proper Shipping Name** | **Hazard Class/ Division** | **Identi-fication Number** | **Packing Group** |
| Helium, compressed | 2.2 | UN1046 | N/A |

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Packaging prescribed is a fully wrapped carbon-fiber reinforced aluminum lined cylinder manufactured in accordance with Dynetek Industries, Ltd Drawings V260TDG223G5N, V260TDG223G5N-01 and -02, V260L223G5N-01, V260C223G5N-01 and -02 on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA). Cylinders have a maximum service pressure of 3240 psig and a maximum water capacity of 260L (9.18 $ft^3$). Cylinders must be designed, manufactured and marked in conformance with Basic Requirements for Fully Wrapped Carbon-Fiber Reinforced Aluminum Lined Cylinders (DOT-CFFC)(Fourth Revision), dated November 2000 except as follows:

(1) CFFC-2 - Cylinders must be wrapped entirely with an epoxy/carbon fiber laminate in lieu of the outer glass filament and epoxy layer. The cylinder maximum water capacity is 260 L in lieu of the maximum 91L capacity.

(2) CFFC-6(a)(vi) - The minimum elongation for a 2 inch tensile specimen of the aluminum liner is 12% in lieu of the specified 10%.

(3) CFFC-10(c) - At a minimum, one cylinder complete with valve must be subjected to a drop test in accordance with ISO 11119-2 in lieu of the CFFC Standard requirements.

(4) CFFC-10(h) - Two cylinders must be tested in accordance with the specified bonfire test, except that the position of the cylinder must be horizontal instead of vertical.

b. TESTING: Cylinders must be reinspected and hydrostatically retested at least once every five years. Testing must be performed in accordance with § 180.209(a) at 5/3 of the marked service pressure, and the latest edition of CGA pamphlet C-6.2 "Guidelines for Visual Inspection and Re-qualification of Fiber Reinforced High Pressure Cylinders", except as specifically noted herein:

(1) Cylinders must be volumetrically tested by the water jacket method suitable for the determination of the cylinder expansion for a minimum test time of one minute.

(2) A maximum permanent expansion to total expansion ratio does not apply. The cylinder must be condemned if the elastic expansion exceeds the rejection elastic expansion (REE) as marked on the cylinder.

(3) Retest markings must be applied on a label securely affixed to the cylinder and overcoated with epoxy, near the original test date. Metal stamping of the composite surface is prohibited. Reheat treatment of rejected cylinders is not authorized.

(4) Cylinders with fiber damage (cuts, abrasions, etc.) that exceed 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:

(i) 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 and less than 0.045 inch for cylinders with an outside diameter greater than 7.5 inches or less than 0.035 inches for cylinders 7.5 inches or less in outside diameter;

(ii) 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 length of the straight sidewall section of the cylinder |
| Cylinder sidewall and domes | In the direction of the fiber (circumferential direction) | 20% of the length of the straight sidewall section of the cylinder |

(5) Cylinders with damage that meet the Level 2 criteria must be rejected. Retesters must contact the cylinder manufacturer in the event that damage is questionable based on this 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.

(6) 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 stated in (5)(a) above 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.

(7) A hydrostatic retest may be repeated as provided for in § 180.205(g)(5), however, only two such retests are permitted. Pressurization prior to the official hydrostatic test for the purpose of a systems check must not exceed 85% of the required test pressure.

c. OPERATIONAL CONTROLS -

(1) Cylinders manufactured under this exemption are not authorized for use fifteen (15) years after the date of manufacture.

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

(3) Cylinders must be manifolded in accordance with the requirements of §173.301(g). A maximum of 10 cylinders may be manifolded.

(4) Cylinders must be transported protected by aluminum frames that are designed and manufactured in accordance with § 173.301(i). The frame must be designed to withstand a static force of eight times the weight of the entire skid structure, including trailer, in three principal axes, applied individually. In addition, the frame must be designed to withstand a static force of seven times longitudinally, three times laterally, and three times vertically, the weight of the structure, applied simultaneously.

(i) For transportation distances under 500 miles, the cylinder/frame assembly must be mounted on a modified M1101 HMMWV trailer. The trailer must be in conformance with Trailer Specification ATPD 2171 on file with the OHMEA.

(ii) For transportation distances of 500 miles or more, the cylinder/frame assembly (either as an independent assembly or while mounted on a modified M1101 HMMWV trailer) must be transported in a truck or tractor-trailer.

8. SPECIAL PROVISIONS:

a. A person who is not a holder of this exemption who 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 reoffered for transportation in conformance with this exemption and the HMR.

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

c. Transportation of cylinders is only authorized as part of a military weapons or defense initiative system.

d. Each cylinder must be marked "DOT-E 13172". In addition, each frame must be marked "DOT-E 13172".

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

10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each cargo vessel, aircraft or motor vehicle 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, 49 CFR 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 inform the AAHMS, in writing, of any incident involving the package and shipments made under the terms of this exemption.

Issued in Washington, D.C.:

Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety

FEB 14 2003
(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