U.S. Department
of Transportation

**Research and
Special Programs
Administration**

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

DEC 1 2004

DOT-E 13580

EXPIRATION DATE: October 31, 2006

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Carleton Technologies, Inc.
Orchard Park, NY

2. PURPOSE AND LIMITATIONS:

a. This exemption authorizes the manufacture, marking, sale and use of non-DOT specification cylinders conforming with all regulations applicable to a DOT specification 39 cylinder, except as specified herein, for the transportation in commerce of the materials authorized by this exemption. 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) and 175.3 in that a non-DOT specification cylinder is not an authorized packaging, except as specified herein.

5. BASIS: This exemption is based on the application of Carleton Technologies, Inc. dated May 6, 2004, submitted in accordance with § 107.105 and the public proceeding thereon.

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6. HAZARDOUS MATERIALS (49 CFR § 172.101):

| Hazardous Material Description | | | |
|---|---|---|---|
| **Proper Shipping Name** | **Hazard Class/ Division** | **Identi-fication Number** | **Packing Group** |
| Nitrogen, compressed | 2.2 | UN1066 | N/A |

7. SAFETY CONTROL MEASURES:

a. PACKAGING - The packaging is described as a pneumatic power module (PPM) used to provide energy to the bomb ejection system of the Joint Strike Fighter and consists of two non-DOT specification, refillable welded titanium bottle halves welded to a titanium manifold. The PPM shall conform to Carleton Technologies Inc. drawings B45774-1 and B45774-3, technical specifications, and performance data on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA), and must be fabricated in accordance with DOT Specification 39 cylinder (§ 178.35 and 178.65) except as follows:

§ 178.35(e) *Safety devices.* Each pressure vessel must be equipped with a pressure relief device designed and prototype tested to vent at a pressure between 5,650 and 6,000 psig and reseat at a minimum pressure of 5,085 psig.

§ 178.65(a) *Type, size, service pressure, and test pressure.*

(a) The Pneumatic Power Module (PPM) is refillable, and has an design operational life of 30 years or 8,000 flight hours, whichever occurs first.

(1) Maximum size is 40.0 cubic inches and maximum service pressure is 5,150 psig.

(2) Minimum test pressure is 12,500 psig

§ 178.65(b) *Material.*

The cylinder must be constructed of 6AL-4V titanium.

§ 178.65(c) *Manufacture.*

* * *

(4) Welding procedures and operation must be qualified in accordance with MIL-STD-2219 and MIL-STD-1595.

(5) Every PPM weldment shall be subjected to die penetrant inspection of the weld joints in accordance with ASTM-E 1417.

(6) Every PPM weldment shall be subjected to radiographic inspection of the weld joints in accordance with ASTM-E 1742

§ 178.65(f) *Pressure tests.*

(1) Each pressure vessel must be tested to an internal pressure of at least 12,500 psig and held for at least one minute and sufficiently longer to assure complete expansion. Evidence of leakage, visible distortion or other defect shall be cause for rejection.

(2) One pressure vessel out of each lot must be hydrostatically tested to destruction. The entire lot must be rejected if:

(i) A failure occurs at a gauge pressure less than 17,500 psig;

(ii) A failure initiates in a weld or heat affected zone thereof.

(3) A "lot" is defined as the quantity of PPM weldments fabricated from the same material, manufactured by the same process and heat treated in the same equipment under the same conditions of time, temperature and atmosphere, and may not exceed a quantity of 36 units.

(4) Each lot will have one PPM weldment destructively tested as follows: a PPM weldment will be hydrostatically cycled for 30,000 cycles.

A cycle consists of charging to 5,000 psig, dwelling, discharging to 1,000 psig and recharging to 5,000 psig. Every 500th cycle shall require complete discharge to approximately 0 psig and recharging to 5,000 psig.

§ 178.65(g) *Flattening test.*

(1) One cylinder or an alternative sample ring representative from the cylinders in each lot, must be flatend. The sample ring must be from the same material and be subjected to the same heat treatment as the lot of cylinders.

(2) The sample ring representative of the cylinder may be flattened. The sample ring may not include the heat affected zone or any weld.

(3) Flattening between flat plates is authorized.

(4) Sample ring may not crack when flattened so that outer surfaces are not more than nine times wall thickness apart.

(5) If the sample ring cracks when subjected to specified flattening test, the lot of cylinders represented by the test must be rejected (see § 178.65(h)).

Add: The PPM shall be heat treated (annealed) in accordance with AMS2801. One heat treat coupon shall accompany each lot of PPM weldments. The coupons shall be subsequently tested for the "alpha case". No "alpha case" shall be present.

Coupons of AMS 4901 composition, nominally .020 inch ().51 mm) thick by 1 inch (25.0 mm) wide shall be used to confirm conformance with heating media requirements. Hydrogen pick-up by coupons heated in air and other non-inert atmosphere shall not exceed 25 ppm when analyzed in accordance with ASTM-E 1447. Coupons heat treated in vacuum or inert gas atmosphere furnaces shall be free from surface contamination determined in accordance with either the microhardness test of AMS 4901 or a metallographic technique approved by the cognizant quality assurance organization.

If a coupon exhibits the "alpha case" then the entire lot of PPM's shall be rejected.

§ 178.65(i) *Markings.*

(1) * * *

(2)(i) "DOT-E 13580" must replace the mark "DOT 39".

(2)(ii) In lieu of "NRC", Refill authorized only by Department of Defense or its contractors must be marked. (See paragraph 7.c.(2))

* * *

(2)(vi) Serial number (in lieu of lot number).

* * *

(2)(viii) Not required.

c. OPERATIONAL CONTROLS -

(1) A copy of the inspector's report required by § 178.35(g) for the first lot of cylinders must be submitted to the OHMEA prior to first shipment.

(2) Cylinders must be shipped enclosed in the Joint Strike Fighter BRU 14/30 bomb ejector rack or in a strong outside packaging in accordance with § 173.301(a)(9).

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.

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

10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each 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, 49 CFR Parts 171-180.
- Persons operating under the terms of this exemption must comply with the security plan requirement in Subpart I of Part 172 of the HMR, when applicable.
- 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.:

DEC 1 2004
Date

Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety

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: DB