

September 14, 2006



U.S. Department
of Transportation

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

**Pipeline and Hazardous
Materials Safety Administration**

DOT-SP 12671
(THIRD REVISION)

EXPIRATION DATE: August 31, 2010

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Carleton Technologies, Inc.
Orchard Park, NY
2. PURPOSE AND LIMITATIONS:
 - a. This special permit authorizes the manufacture, mark, sale and use of non-DOT specification, refillable, toroidal shaped pressure vessels conforming with all regulations applicable to a DOT specification 39 cylinder, except as specified herein, for the transportation in commerce of Helium. This special permit provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein.
 - b. The safety analyses performed in development of this special permit 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 §§ 173.302a and 175.3 in that the use of a non-DOT specification packaging is not authorized except as specified herein.
5. BASIS: This special permit is based on the application of Carleton Technologies, Inc. dated September 7, 2006, submitted in accordance with § 107.109.

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6. HAZARDOUS MATERIALS (49 CFR § 172.101):

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

Note: A missile gas storage system or component which contains a quantity of pyrotechnic materials must be classed and approved as provided for in § 173.56. If the pyrotechnic material augments the volume of the gas in the cylinder, or in any way enhances the performance of the compressed gas, the device must be tested in the same configuration as when shipped.

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Packaging prescribed is a non-DOT specification, toroidal shaped, welded pressure vessel equipped with a pyrotechnic pressure relief device. Each pressure vessel must conform with Carleton Technologies application for special permit and with Carleton Technologies drawing B15140 dated September 30, 1991, on file with the Office of Hazardous Materials Special Permits and Approvals (OHMSPA). Each pressure vessel must conform with the DOT Specification 39 (§§ 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 of 15,000 (+/- 2,000) psig.

§ 178.65(a) *Type, size, service pressure and test pressure.* Each pressure vessel must be a toroid of welded construction.

(1) Maximum water capacity is 23 cubic inches nominal.

(2) Maximum service pressure is 10,000 psig.

(3) Minimum test pressure is 17,000 psig.

§ 178.65(b) *Material.*

(1) Steel. Material must be aircraft quality, Carpenter Custom 455 steel.

(2) Does not apply.

§ 178.65(c) *Manufacture.*

(1) * * *

(2), (3) N/A

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

ADD: (5) Heat treatment. Each completed pressure vessel must be heat treated to provide the mechanical properties required in this special permit.

ADD: (6) The exterior of each finished pressure vessel must be subjected to a penetrant or magnetic particle inspection after heat treatment and application of test pressure. Evidence of discontinuities that may appreciably decrease the integrity of the pressure vessel shall be cause for rejection.

ADD: (7) All welds shall be subjected to 100 percent radiographic inspection and 100 percent magnetic particle inspection per MIL-I-6868. Evidence of discontinuities that may appreciably decrease the integrity of the pressure vessel shall be cause for rejection.

§ 178.65(d) *Wall thickness.* * * *

(1), (2) N/A

ADD: (3) Calculation of the stress for toroids must be made in accordance with acceptable stress and strain formulas for pressure vessels.

§ 178.65(e) *Openings and Attachments.* Any openings on the pressure vessel must be of a design that will not reduce the integrity of the pressure vessel.

§ 178.65(f) *Pressure tests.*

(1) Each pressure vessel must be tested to an internal pressure of at least 17,000 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 25,000 psig;

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

(3) A lot is defined as the quantity of pressure vessels fabricated from the same heat of steel, 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 200.

§ 178.65(g) *Flattening test.* One pressure vessel out of each lot must be subjected to a flattening test.

(1) Not applicable.

(2) A ring taken from a completed vessel or a coupon of the same material and shape and subjected to the same heat treatment as the pressure vessels may be flattened as an alternative to a test on the completed pressure vessel.

(3) (ADD) Flattening between flat plates is authorized.

(4) The pressure vessel or test ring may not crack when flattened so that their outer surfaces are not more than 10 times wall thickness apart.

(5) * * *

§ 178.65(i) *Markings.*

(1) * * *

(2)(i) "DOT-SP 12671" must replace the mark "DOT 39".

(2)(ii) The statement: Refill authorized only by Carleton Technologies. (See paragraph 7.c.(2))

* * *

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

* * *

(2)(viii) Not applicable.

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b. DESIGN QUALIFICATION TESTING - Each design must be qualified by subjecting a representative pressure vessel to a cycle test from zero to service pressure at a rate not to exceed 6 cycles per minute. The pressure vessel must withstand at least 1,000 cycles without distortion or defect.

c. OPERATIONAL CONTROLS -

(1) Pressure vessels must be shipped in strong outside packagings in accordance with § 173.301(a)(9).

(2) Each pressure vessel may be refilled a maximum of five times. The pressure vessel must only be refilled by Carleton Technologies. Topping off is considered a refill. Carleton Technologies must maintain a record of refills by serial number.

8. SPECIAL PROVISIONS:

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

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- b. A person who is not a holder of this special permit, but receives a package covered by this special permit, may reoffer it for transportation provided no modification or change is made to the package and it is offered for transportation in conformance with this special permit and the HMR.
- c. A current copy of this special permit must be maintained at each facility where the package is offered or reoffered for transportation.
- d. Each packaging manufactured under the authority of this special permit 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 Special Permits and Approvals for a specific manufacturing facility.
- e. A current copy of this special permit must be maintained at each facility where the package is manufactured under this special permit. It must be made available to a DOT representative upon request.
- f. Packagings permanently marked 'DOT-E 12671', prior to October 1, 2007 may continue to be used under this special permit for the remaining service life of the packaging or until the special permit is no longer valid. Packagings marked on or after October 1, 2007 must be marked 'DOT-SP 12671'.
- g. Shipping papers displaying 'DOT-E 12671' may continue to be used until October 1, 2007, provided the special permit remains valid.
9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, and cargo aircraft only.
10. MODAL REQUIREMENTS: A current copy of this special permit must be carried aboard each aircraft used to transport packages covered by this special permit. The shipper must furnish a current copy of this special permit to the air carrier before or at the time the shipment is tendered.

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11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this special permit 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 special permit and the Hazardous Materials Regulations, Parts 171-180.
- o Persons operating under the terms of this special permit must comply with the security plan requirement in Subpart I of Part 172 of the HMR, when applicable.
- 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 special permit must receive training on the requirements and conditions of this special permit in addition to the training required by §§ 172.700 through 172.704.

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

Under Title VII of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)- 'The Hazardous Materials Safety and Security Reauthorization Act of 2005' (Pub. L. 109-59), 119 Stat. 1144 (August 10, 2005), amended the Federal hazardous materials transportation law by changing the term 'exemption' to 'special permit' and authorizes a special permit to be granted up to two years for new special permits and up to four years for renewals.

12. REPORTING REQUIREMENTS: Shipments or operations conducted under this special permit are subject to the Hazardous Materials Incident Reporting requirements specified in 49 CFR §§ 171.15 - Immediate notice of certain hazardous materials incidents, and 171.16 - Detailed hazardous materials incident reports. In addition, the grantee(s) of this special permit must notify the Associate Administrator

for Hazardous Materials Safety, in writing, of any incident involving a package, shipment or operation conducted under terms of this special permit.

Issued in Washington, D.C.:

A handwritten signature in blue ink, appearing to read "R. Ryan Taylor".

for Robert A. McGuire
Associate Administrator
for Hazardous Materials Safety

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

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

PO: CWF/sln