

January 23, 2004



U.S. Department  
of Transportation

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

**Research and  
Special Programs  
Administration**

DOT-E 9832  
(FIFTH REVISION)

EXPIRATION DATE: December 31, 2005

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: L'Air Liquide, Sassenage, France  
(U.S. Agent: Air Liquide America L.P.)  
Houston, TX
2. PURPOSE AND LIMITATIONS:
  - a. This exemption authorizes the manufacture, mark, sale and use of a vacuum insulated, non-DOT specification portable tank 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 §§ 172.203(a), 173.315, 173.318 and 176.76(g)(1) in that non-DOT specification portable tanks are not authorized for cryogenic liquids, except as specified herein.
5. BASIS: This exemption is based on the application of L'Air Liquide dated December 18, 2003, submitted in accordance with § 107.109.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Proper Shipping Name/ Hazardous Material Description	Hazard Class/ Division	Identi- fication Number	Packing Group
Helium, refrigerated liquid ( <i>cryogenic liquid</i> )	2.2	UN1963	N/A
Hydrogen, refrigerated liquid ( <i>cryogenic liquid</i> )	2.1	UN1966	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Prescribed packaging is a vacuum insulated non-DOT specification portable tank for the transportation of liquid hydrogen and helium. The portable tank, designed and constructed in accordance with Section VIII of the ASME Code and subparagraphs a and b of this paragraph, is enclosed in an ISO type frame. Design pressure for the internal tank is 65 PSIG for model 40 000 CNT or 79 PSIG for model 40 000 CNTR. The portable tank is vacuum insulated with a supplemental nitrogen shield. Design temperature is -453°F for the inner tank, and -325°F for the nitrogen shield. The inner tank has a nominal water capacity of 1,050 gallons. The volume of the nitrogen shield is 338 gallons. Inner tank and nitrogen tank material is SA 240 Type 304L stainless steel for the inner tank, and carbon steel for the jacket and ISO frame.

(1) Each portable tank must conform to L'Air Liquide drawings nos. 649 3587 EA0 0001 Rev c (dated 10/13/86); 649 3587 F A0 01 Rev b (dated 10/14/86); 649 3587 I A00 01 Rev c (dated 10/14/86); 649 3587 L A0 001 Rev a (dated 3/18/87); 649 13587 L A1 001 Rev a (dated 3/18/87) and referenced drawings and calculations on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA) and with § 178.338 except as follows:

(2) Each portable tank must also conform with § 178.338 except as follows:

(i) Impact testing is required for stainless steel tanks with a design temperature colder than -425°F.

(ii) Section 178.338-10 does not apply.

(iii) The portable tank need not conform with § 178.338-13(b) or (c). Lifting lugs, framework and any anchoring to the inner tank, the helium shield tank or the tank jacket must conform with § 178.338-13(a). Each portable tank design must be qualified in accordance with § 178.270-13(c).

(iv) "DOT-E 9832" must replace the mark "MC 338".

(3) Each portable tank in hydrogen service must be equipped with a special fire abatement system and other safety equipment in accordance with L'Air Liquide Safety Instruction DTA/GCP1/PS/SG/88.0149 (enclosed with Liquid Air Corporation's letter of July 5, 1988) on file with the OHMEA.

b. TESTING - Each portable tank must be re-inspected and retested once every 5 years at a pressure of one and one-fourth times the sum of the design pressure plus the static head plus 14.7 psig in accordance with § 173.32(e) as prescribed for DOT 51 Specification portable tanks. The test pressure must be reduced by 14.7 psig if the inner tank is under vacuum while under test.

c. OPERATIONAL CONTROLS -

(1) Each portable tank must be plainly marked "DOT-E 9832" on both sides near the middle, in letters at least two (2) inches high on a contrasting background.

(2) Each portable tank must be prepared and shipped as required in § 173.318, as applicable for the lading.

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. Each packaging manufactured under the authority of this exemption 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 Exemptions and Approvals for a specific manufacturing facility.

d. 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.

e. Shipments by cargo vessel must conform with the following:

(1) The package must conform with the requirements of § 176.76(g). The portable tank may not be overstowed with other containers or freight.

(2) The legend "One-Way Travel Time \_\_\_\_\_ Hours" or "OWTT \_\_\_\_\_ Hours" must be marked on the shipping paper and on the dangerous cargo manifest immediately after the container description.

The OWTT is determined by the formula:

$$\text{OWTT} = \text{MRHT} - 24 \text{ hours.}$$

(3) A written record of the portable tank's pressure and ambient (outside) temperature at the following times must be prepared for each shipment.

- (i) At the start of each trip;
- (ii) Immediately before and after any manual venting;
- (iii) At least every 24 hours; and
- (iv) At the destination point.

(4) Any lading road relief valve set at a pressure lower than that prescribed for the (safety) pressure relief valve must be closed during transportation by cargo vessel.

(5) Portable tanks in hydrogen service must be stowed on deck, in the open, and located so as to prevent any accumulation of hydrogen.

(6) The Coast Guard Captain of the Port must be notified of a hydrogen shipment as least 24 hours in advance of its arrival in the port.

f. Shipments by motor vehicle must conform with the following:

(1) The OWTT must be determined for each portable tank used in hydrogen service by the formula:

$$\text{OWTT} = 0.5(\text{MRHT} - 24) \text{ for MRHT less than 72 hours.}$$

$$\text{OWTT} = \text{MRHT} - 48 \text{ for MRHT of 72 or more hours.}$$

(2) The provisions of § 177.840 apply to each portable tank used in hydrogen service.

(3) The portable tank must be secured to the motor vehicle in accordance with the requirements of §§ 393.100 through 393.106.

Additionally, the motor vehicle's bumper must be located at least 6 inches to the rear of any portable tank component used for loading or unloading or any component that may contain lading.

(4) Each portable tank used in hydrogen service must be marked "One-way travel time \_\_\_\_\_ Hours" or "OWTT \_\_\_\_\_ Hours" in letters at least 2 inches high near the "DOT-E 9832" marking. The proper OWTT must be determined using the formulas found in subparagraph f(1) described above.

g. No person may transport or offer for transportation a charged portable tank unless the pressure of the lading is equal to or less than that used to determine the marked rated holding time and the OWTT is equal to or greater than the elapsed time between the start and termination of travel.

- h. The actual holding time for each tank must be determined after each shipment. If it is determined that the actual holding time is less than 90 percent of the MRHT of the tank, the tank may not be refilled until it is restored to its MRHT or the tank is remarked with the holding time determined by this examination.
- i. The portable tank must be secured to the motor vehicle in accordance with the requirements of §§ 393.100 through 393.106. Additionally, the motor vehicle's bumper must be located at least 6 inches to the rear of any tank component used for loading or unloading that may contain lading during transit.
- j. Transportation of Division 2.1 materials (flammable gases) are not authorized aboard cargo vessel unless specifically authorized in the Hazardous Materials Table (§ 172.101).
9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, cargo vessel.
10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each cargo vessel or motor vehicle used to transport packages covered by this exemption.
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.

A handwritten signature in blue ink that reads "R. Ryan Torler". The signature is stylized with a large, sweeping initial "R" and a long, horizontal flourish extending to the right.

for 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: KFW/alb