



U.S. Department
of Transportation

Research and
Special Programs
Administration

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

MAY 25 2004

DOT-E 6349
(SIXTH REVISION)

EXPIRATION DATE: April 30, 2006

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Praxair, Inc.
Danbury, CT
2. PURPOSE AND LIMITATION:
 - a. This exemption authorizes the transportation in commerce of refrigerated, liquefied gases listed in paragraph 6, below, in a non-DOT specification portable tank. 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 § 173.315 in that a non-DOT specification portable tank is not authorized, except as specified herein.
5. BASIS: This exemption is based on the application of Praxair Inc. dated February 26, 2004, submitted in accordance with § 107.109.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Proper Shipping Name/ Hazardous Materials 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 an insulated, non-DOT specification portable tank designed and constructed in accordance with Section VIII of the ASME Code, and with subparagraphs (1) or (2), as appropriate, of this paragraph. The portable tank has a maximum gross weight of 49,000 pounds, and is skid mounted, or enclosed in an ISO-type frame. The portable tank is vacuum insulated with a supplemental liquid nitrogen shield. Design pressure is 68 psig for the internal tank, and 10 psig for the liquid nitrogen tank. Design temperature is -452°F for the inner tank and any part, valve or fitting that may come in contact with the lading; and -320°F for the liquid nitrogen tank and any part, valve or fitting that may come in contact with liquid nitrogen. Water capacity for the inner tank is 8,500 gallons, nominal. Tank material is SA-240 Type 304 or 304L stainless steel for the inner tank and the nitrogen tank; ASTM A 283, SA 36 or equivalent steel for the outer jacket.

(1) Each portable tank constructed on or before July 31, 1988, must conform to the portable tank described by drawings and calculations for Crynco model D20630 submitted with Crynco's letters dated September 22, 1970, December 9, 1970, May 24, 1972 and September 10, 1973 on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA). Portable tanks used for hydrogen service must further conform with Crynco Drawings A6489, Rev. A; D20317, Rev. E; D20318, Rev. E; D21013, Rev. D; D21640, Rev. G; A21813 and D 24889 on file with OHMEA. No new construction is authorized after July 31, 1988.

(2) Each portable tank constructed after July 31, 1988 must conform with § 178.338, except as provided in this subparagraph. Corresponding drawings and calculations must be submitted to the OHMEA prior to first shipment.

(i) Impact testing is not required for inner tank material of cargo tanks with a design temperature warmer than -420°F .

(ii) § 178.338-10 does not apply.

(iii) The portable tank need not comply with § 178.338-13(a) and (b). Lifting lugs, framework and any anchoring to the inner tank, the nitrogen tank or the tank jacket must conform with § 178.338-13(a). A portable tank that meets the definition of "container" in § 450.3(a)(2) must meet the requirements of 49 CFR Parts 450 through 453, and each design must be qualified in accordance with § 178.270-13(c).

(iv) The marking "DOT-E 6349" must replace the mark "MC 338" on the required specification plate.

b. TESTING - Each portable tank must be reinspected and retested once every five years in accordance with § 173.32(e) as prescribed for DOT Specification 51 portable tanks. The test pressure of the inner tank must be determined from the following formulas--

(1) If there is no vacuum in the outer jacket during the test:

$$P_T = 1.25 \times [P_d + H_s + 14.7]; \text{ or}$$

(2) If vacuum exists in the outer jacket during the test:

$$P_T = 1.25 \times [P_d + H_s + 14.7] - 14.7$$

where--

P_T = Test pressure (psig)

P_d = Design pressure (maximum allowable working pressure) (psig)

H_s = Static head of liquid in inner tank (psig).

8. SPECIAL PROVISIONS:

a. Each portable tank must be plainly marked "DOT-E 6349" on both sides near the middle, in letters at least two (2) inches high on a contrasting background. Each portable tank used in hydrogen service must be marked "One-way travel time (OWTT) _____ Hours" or "OWTT _____ Hours" in letters at least two (2) inches high near the "DOT-E 6349" marking. The proper OWTT must be determined using the formulas in subparagraph 10.b.(1) or 10.d.(2), as appropriate.

b. Each portable tank must be prepared and shipped as required in § 173.315, as applicable to the lading.

c. No person may transport 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.

d. 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 marked rated holding time (MRHT) of the tank, the tank may not be refilled until it is restored to its MRHT or the tank is emarked with the reduced holding time determined by this examination.

e. Continued use of tanks fabricated before November 30, 1978 is authorized.

f. The loss of helium contents is not a reportable incident if the release is through a pressure controlling device set at 25 psig or less during shipments by motor vehicle and rail freight.

g. 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.

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

- i. Each portable tank must be plainly and durably marked on both sides near the middle in letters and numbers at least two inches high, on contrasting background, "DOT-E 6349".
9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, and cargo vessel, except that transport of hydrogen is limited to transportation by motor vehicle only.
10. MODAL REQUIREMENTS:
- a. A current copy of this exemption must be carried aboard each cargo vessel or motor vehicle used to transport packages covered by this exemption.
- b. Shipments by motor vehicle must conform with the following:
- (1) The OWTT must be determined and marked on each portable tank used in hydrogen service by the formula:
- $$\text{OWTT} = 0.5 (\text{MRHT} - 24), \text{ for MRHT less than 72 hours, or}$$
- $$\text{OWTT} = \text{MRHT} - 48, \text{ for MRHT of 72 or more hours.}$$
- (2) The provisions of § 177.840 apply to each portable tank used in hydrogen service.
- c. Shipments by rail are authorized in trailer-on-flat car service only when the portable tank is mounted and secured on a GINDY Trailer chassis model CH-240-GSP-1, as witnessed by a Federal Railroad Administration representative.
- d. Shipments by cargo vessel must conform with the following:
- (1) The package must conform to § 176.76(g). Portable tanks may be overstowed only if enclosed in an ISO-type frame and otherwise suitably protected. Portable tanks must be stowed such that they are readily accessible and can be monitored in accordance with the provisions of this exemption.
- (2) The legend "One-Way Travel Time _____ Hours" (or "OWTT _____ Hours") must be included on the shipping paper and on the dangerous cargo manifest immediately after the entry otherwise required for the shipment. The OWTT is determined by the formula:

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OWTT = MRHT - 24 hours.

(3) For each shipment, a written record must be prepared of the portable tank's pressure and the ambient (outside) temperature at the following times:

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

(4) Any lading road relief (pressure control) valve (PCV) set at a pressure lower than that prescribed for the (safety) pressure relief valve must be closed during transportation by cargo vessel, unless the OWTT is determined based on the setting of the PCV.

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, 49 CFR Parts 171-180.
- o 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.
- 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 the 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.:



fa Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety

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(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: sdc