MAY 15 1998

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

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

DOT-E 12055
(FIRST REVISION)

EXPIRATION DATE: ***April 30, 2000***

(FOR RENEWAL, SEE 49 CFR 107.109)

1. GRANTEE: M.D. Cryogenics, Inc.
Pearland, Texas

2. PURPOSE AND LIMITATIONS:

a. This exemption authorizes the manufacture, marking, sale and use of a non-DOT specification vacuum insulated portable tank, conforming with all regulations applicable to a DOT Specification MC 338 cargo tank, except as specified herein, to be used for the transportation in commerce of nitrogen, refrigerated liquid. This exemption provides no relief from any regulation 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 173.318 and 176.76(g)(1) in that a non-DOT specification packaging is authorized; and 178.338 as specified herein.

5. BASIS: This exemption is based on the application of M.D. Cryogenics, Inc. dated March 30, 1998, and supplemental information dated April 7 and April 8, 1998, submitted in accordance with 49 CFR 107.105 and the public proceeding thereon.

6. HAZARDOUS MATERIALS (49 CFR 172.101):

| Hazardous materials description -- proper shipping name | Hazard Class/ Division | Identification Number |
|---|---|---|
| Nitrogen, refrigerated liquid | 2.2 | UN1977 |

7. PACKAGING(S) and SAFETY CONTROL MEASURES:

a. PACKAGING - (1) Packaging authorized is an insulated non-DOT specification portable tank designed and constructed in accordance with DOT Specification MC-338 cargo tank motor vehicle, except as modified herein. The portable tank is enclosed in an ISO type frame and is vacuum-insulated. Design pressure is 40 PSIG for the internal tank. Design temperature is -320°F for the inner tank and any part, valve or fitting that may come in contact with the lading. Water capacity is 2000 gallons, nominal. Tank material is SA 240 Type 304 for the inner tank and A572 Grade 50 and A36 carbon steel for the outer jacket.

(2) Tanks must conform with M.D. Cryogenics Drawing No. 9401-03 dated 5/11/95, 1019-41-2 Rev 0 dated 2/1/96, and Stewart & Stevenson Dwg 1019-41-1 Rev 0 dated 2/1/96. All tanks must conform with calculations, specifications and drawings on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA) and with 49 CFR 178.338, except as follows.

(i) §178.338-10 does not apply.

(ii) The portable tank need not conform with §178.338-13(b) or (c). Lifting lugs, framework and any anchoring to the inner tank or the tank jacket must conform with §178.338-13(a).

(iii) Portable tanks that meet the definition of "container" must meet the requirements of 49 CFR parts 450 thru 453, and each design must be qualified in accordance with 49 CFR 178.270-13(c).

b. TESTING - Each portable tank must be reinspected and retested once every five years in accordance with the procedure prescribed in 49 CFR 173.32(e) for DOT Specification 51 portable tanks. The test pressure for the inner tank shall be determined from the following formulas:

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

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

If vacuum exists in the outer jacket during test:

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

Where:

$P_T$ = Test pressure, psig

$P_d$ = Design pressure (the sum of the maximum allowable working pressure, liquid head and 14.7 psi)

$H_s$ = Static head of liquid in inner tank, psi

c. OPERATIONAL CONTROLS -

(1) Each portable tank must be prepared and shipped as required in 49 CFR 173.318, as applicable for the lading.

(2) Shipments by cargo vessel must conform with the following:

(i) The package must conform with 49 CFR 176.76(g). The portable tank must not be overstowed with other containers or freight.

(ii) 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:

OWTT = MRHT - 24 hours.

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

(A) At the start of each trip;

(B) Immediately before and after any manual venting;

(C) At least every 24 hours; and

(D) At the destination point.

(iv) 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 unless the holding time was determined based on the setting of the pressure control valve.

(3) 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 (MRHT) and the OWTT is equal to or greater than the elapsed time between the start and termination of travel.

(4) 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 re-marked with the reduced holding time determined by this examination.

(5) The holding time and the MRHT of the first portable tank must be determined and results thereof must be submitted to OHMEA prior to initial shipment.

8. SPECIAL PROVISIONS:

a. Offerors for transportation of the hazardous materials specified in this exemption may use the packaging described in this exemption for the transportation of such hazardous materials provided no modifications or changes are made to the packages, all terms of this exemption are complied with, and a copy of the current exemption is maintained at each facility from which such offering occurs.

b. 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.

c. A copy of this exemption, in its current status, must be maintained at each manufacturing facility at which this packaging is manufactured and must be made available to a DOT representative upon request.

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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. (49 CFR 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 at Washington, D.C.

Ann Mazzullo 5/15/98

for Alan I. Roberts (DATE)
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.

The original of this exemption is on file at the above office. Photo reproductions and legible reductions of this exemption are permitted. Any alteration of this exemption is prohibited.

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