U.S. Department
of Transportation

**Research and
Special Programs
Administration**

JAN 30 1998

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

DOT-E 1479
(EIGHTH REVISION)

EXPIRATION DATE: **December 31, 1999**

(FOR RENEWAL, SEE 49 CFR SECTION 107.109)

1. GRANTEE: The Department of Defense
Washington, DC

2. PURPOSE AND LIMITATION: This exemption authorizes the transportation in commerce of a poisonous cryogenic liquid and a nonflammable cryogenic liquid in non-DOT specification cargo tanks. This exemption provides no relief from any regulation other than as specifically stated herein.

3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR Sections 172.101, 173.318, 178.338.

5. BASIS: This exemption is based on the application of the Department of Defense dated February 28, 1997, submitted in accordance with 49 CFR 107.109.

6. HAZARDOUS MATERIALS (49 CFR 172.101):

Hazardous materials description -- proper shipping name	**Hazard Class/ Division**	**Identi-fication Number**	**Packing Group**
Fluorine, **refrigerated liquid (cryogenic liquid)**	2.3	NA9192	N/A

7. PACKAGING AND SAFETY CONTROL MEASURES: Packaging prescribed is a vacuum insulated, liquid nitrogen cooled, non-DOT specification cargo tank motor vehicle designed and fabricated in accordance with Section VIII of the ASME Code and subparagraph a. or b. of this paragraph. Each cargo tank assembly must consist of a three (3) shell, horizontally mounted tank on a flat bed trailer. The outer and intermediate tank shells must be concentric and the inner shell must be displaced downward below the line of concentricity about 2 ½-inches. Each cargo tank must conform with the requirements of subparagraphs c. through k. of this paragraph.

a. Each cargo tank must conform with one of the following drawings on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA).

(1) Allied Chemical Corporation's drawing 55540D, dated November 5, 1956, 55541D, dated November 7, 1956, 55543E, dated November 21, 1956, and 56693D dated November 26, 1956. No new construction is authorized after December 31, 1986.

(2) Allied Chemical Corporation's drawings 401141 through 401148. No new construction is authorized after December 31, 1986.

(3) National Advisory Committee for Aeronautics, Lewis Flight Propulsion Laboratory drawings CF 53982, CF 53983, CF 53985, CF 53986, CF 53987 Rev. 1, CC 53984, CD 53989 and NASA, Lewis Research Center drawing CF 53988. No new construction is authorized after December 31, 1986.

(4) These trailers are identified by Allied's serial numbers T 129, T 169, T 185, T 197, T 571, and KAFB's serial numbers KAFB R/N 58X001 and 57X01957.

b. Cargo tank motor vehicles made after December 31, 1986 must be designed and fabricated in accordance with 49 CFR 178.338, except that impact testing is not required on stainless steels, and the marking "DOT-E 1479" must replace the mark "MC 338".

c. The inner (product) tank of each cargo tank must be made from monel (SB 127-400) or type 304 ELC stainless steel material and must conform with the following:

(1) The tank must be designed for a pressure of at least 70 psi internal, and an external pressure of 30 psi. The design temperature must be -320 degrees F.

(2) The water capacity may not exceed 468 gallons, nominal.

d. The intermediate (nitrogen) tank of each cargo tank must be made from SA 240 Type 304 or 304 ELC stainless steel and must conform with the following:

(1) The design pressure must be at least 30 psig, internal, and 10 psig, external. The design temperature must be -320 degrees F. The tank must be equipped with a venting system that operates at atmospheric pressure. The tank must be protected with a pressure relief system described in subparagraph g.(3).(I). of this paragraph.

(2) The water capacity of the nitrogen tank must be at least 230 gallons, nominal.

e. The insulation tank (outer jacket) must conform with the following:

(1) The outer jacket must be made from SA 285 Gr. C or equivalent carbon steel with a design pressure of 15 psig external and at least 30 psig internal. The design temperature must be 200°F.

(2) Insulating material must be perlite or equivalent essentially non-combustible material having low conductivity. The insulation tank must be evacuated to a vacuum of at least one millimeter mercury then sealed.

(3) The insulation system must be designed to have a holding time of at least 15 days without replenishing liquid nitrogen coolant at which time the low liquid nitrogen level alarm system is activated.

(4) A portable Stokes vacuum gauge or an electronic vacuum gauge must be provided to check the vacuum of the annular insulation space when the consumption of liquid nitrogen exceeds normal demand. The absolute pressure range must be 1 to 1000 microns.

f. The mounting of the cargo tank assembly must conform with 49 CFR 178.338-13.

g. Each cargo tank must be equipped with the following:

(1) The inner tank must be provided with the following:

(I) Tanks made after December 31, 1986, must be equipped with a pressure relief system conforming with 49 CFR 173.318 consisting of one or more spring loaded pressure relief valves outboard of and in series with a monel rupture disk. A pressure relief valve made of monel need not have a monel rupture disk. The pressure relief valve must be set to function at not over tank design pressure. The rupture disk must be designed to function at not less that 120 percent and not more than 150 percent of pressure relief valve setting.

(ii) A pressure sensor made of monel having a single contact switch, adjustable in the range 15 to 20 psig, which must energize a high pressure alarm when contact is made. The pressure sensor must be isolated from (fluorine) lading by double valves.

(iii) A helicoid bourdon tube pressure/vacuum instrument with a range of 30 inches Hg vacuum to 100 psi in the gas phase. All parts in contact with the lading must be monel and must be cleaned and degreased as for oxygen service. Electrically fused joints shall be used in assembling and sealing the bourdon tube.

(2) The outer tank must be equipped with a pressure relief system to prevent pressure buildup in excess of three-fourths of the tank's internal design pressure. The outer shell must be equipped with a spring loaded pressure relief valve set to function at 3 psig.

(3) The intermediate tank must be provided with the following:

(I) One spring-loaded pressure relief valve in parallel with a rupture disk in the gas phase and another in the liquid phase. The spring-loaded relief valve must be set to discharge at 30 psig. The rupture disk must be designed to function at 40 psig.

(ii) For the tank described in paragraph 7.a.(1), a liquid nitrogen contents gauge calibrated in gallons from 0 to 340, and equipped with a single contact switch, adjustable on the range of 40 to 55 percent of nitrogen tank capacity, which must energize a low level alarm when contact is made.

(iii) For the tank described in paragraph 7.a.(2), a liquid nitrogen contents gauge calibrated in gallons, equipped with a single contact switch adjustable on the range of 40 to 55 percent of nitrogen tank capacity, which must energize a low level alarm when contact is made.

(iv) The gas and the liquid phases must be equipped with a nitrogen pressure gauge calibrated from zero to 100 psig.

h. The primary product lines on each cargo tank must be double valved in accordance with one of the following:

(1) The fluorine gas feed/discharge valves must be of the Bell-O-Seal line manufactured by William Powell Company described in Catalog No. 253, or Annin Company's models 1610 and 1611 or equivalent. The material must be monel or equivalent. The bellows must be welded to the body and be backed up by a packing gland in which the bottom packing ring must be copper braid hydraulic packing. The balance of the packing must consist of teflon "V-rings." The valves must be suitable for service between 30 inches of mercury, vacuum and 150 psig. The liquid discharge valve must be identical to the gas feed/discharge valves except that the stem and bonnet must be extended so that the distance from the seat to the packing will be 8 ½ inches. All other valves in contact with fluorine, except vacuum and instrument valves, must consist of monel or forged brass bodies with stainless steel or nickel alloy seats.

(2) The liquid nitrogen product discharge valve must have the packing gland at least 8 inches from the valve seat and must be standard for low temperature service. The vacuum valves must be one inch, packless, Hollis McCanna or equivalent. All other valves, except vacuum and instrument valves, must consist of monel or forged brass bodies with stainless steel or nickel alloy seats.

I. The gauges, valves, fittings and piping having access to product lading must be under lock cover or otherwise protected against possible tampering during transit.

j. Maximum filling density determined from the weight ratio of the lading over tank water capacity must be 128.3 percent at a pressure relief valve setting of 70 psig.

k. Prior to and after each loading and unloading operation, each cargo tank must be subjected to an inspection conforming with the checklist contained in "SA-ALC/SFSP LIQUID FLUORINE TRAILER DRIVERS' INSTRUCTION" booklet or "ALLIED'S LIQUID FLUORINE TRAILER DRIVERS MANUAL." The checklists must be retained by the performing facility at least 2 years.

l. The motor carrier must equip each unit with a fire retardant blanket, which must be readily available for use in protecting the cargo tank from heat in event of a tire fire.

m. Outage and filling must be in accordance with 49 CFR 173.24b.

n. Cargo tank vehicles while loaded, and where feasible, must not be parked, even though attended, on any public roadway, or within 500 feet of any bridge, tunnel, dwelling, building, or place where persons work, congregate, or assemble.

o. Two drivers, meeting the qualifications described below, must be assigned to each cargo tank motor vehicle. Shipments must be transported from origin to destination without lay-over enroute, except for necessary rest stops of short duration. The vehicle must be attended at all times by a driver, or other responsible and qualified representative of the motor carrier, shipper, or of the Department of Defense. Drivers and other attendants accompanying each shipment must be informed of the characteristics of the material being transported and of its inherent dangers, and must be fully instructed in the measures and procedures to be followed to protect the public from these dangers in the event of accident or emergency, using the training manual "Liquid Fluorine Trailer Drivers Instructions", published and maintained by the SA-ALC/SFSP, Transportation Section. Additionally, drivers must meet and are subject to all requirements of 49 CFR 383, 391 and 392. Further, they must meet the following requirements:

(1) Age - Not less than 25 years old.

(2) Experience

(a) Three years driving experience in the transport of hazardous materials classified Poisonous or Poison Inhalation Hazard; this experience may be obtained with one company, or with several companies.

(b) Five years experience driving semi-trailer vehicles.

(c) Two years experience driving semi-trailer cargo tank motor vehicles.

(d) Driver must permit the release of and carriers must submit driver's name, social security number, date of birth, license number(s) and other necessary information to an agency (including state license bureau's) or driver's license registry service.

p. Carrier must maintain a safety rating, as assigned by the Office of Motor Carrier Field Operations (OMCFO), Federal Highway Administration, of "Satisfactory", this must be pursuant to the procedures specified in 49 CFR Part 385.

q. The motor carrier must furnish to drivers of each cargo tank motor vehicle written instructions, showing the route to be taken from point of origin to destination, which must be planned insofar as practicable so as to avoid congested thoroughfares, street car tracks, tunnels, viaducts, dangerous crossings and places where crowds assemble. Such instructions must designate the places where stops are to be made for fuel and meals, as well as the procedure to be followed to assure that the cargo tank motor vehicle is attended at all times until delivery to the consignee is accomplished.

r. The designated routes must be reviewed periodically. The renewal application must contain a certification that the designated routes have been reviewed and remain the safest practicable route, taking into account as a minimum the criteria specified in 49 CFR 397.9.

8. SPECIAL PROVISIONS:

a. Each tank must be plainly placarded "POISON GAS" and "OXIDIZER" and marked "INHALATION HAZARD" in letters at least 3-1/2 inches in height on each side of the tank near the placards. In addition, each tank must be marked on the right side near the front, in letters at least two inches high on a contrasting background "DOT-E 1479."

b. Each tank must be reinspected and retested in accordance with 49 CFR 180.407 as required for DOT Specification MC-338 cargo tanks. Test pressure must be one and one-quarter times the maximum allowable working pressure (MAWP). Pneumatic retesting using nonflammable gas (e.g. nitrogen or helium) is authorized.

c. Prior to and after each loading and unloading operation, each cargo tank must be subjected to the inspection checklists HQ-SA-ALC SFRM Numbers 3 and 4. The inspection checklist must be retained at the inspection facility for at least 2 years.

d. The Department of Defense must have an operational emergency response plan for fluorine and nitrogen, refrigerated liquid highway transportation routes. This emergency response plan shall be fully in accordance with the "Multi-Product Emergency Response Plan for Inhalation Hazards" (MPERP) dated March 7, 1994, promulgated by the San Antonio Air Logistics Center, Directorate of Aerospace Fuels Management, Kelly Air Force Base, Texas 78241-5603. This plan must include orientation training, mitigation demonstration and static display, tabletop exercises and notification tests as set forth in Section F. of the MPERP. A copy of the exercise results and evaluation must be submitted to the OHMS within 45 days of exercise completion and prior to the next renewal of the exemption.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle.

10. MODAL REQUIREMENTS:

A copy of this exemption must be carried aboard each motor vehicle used to transport the materials authorized 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. Section 5101 et seq:

- All terms and conditions prescribed in this exemption and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
- Registration required by 49 CFR 107.601 et seq., when applicable.

Each "hazmat employee", as defined in 49 CFR 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 49 CFR 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. (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 inform the AAHMS, in writing, of any incidents involving the package and shipments made under the terms of this exemption.

Issued at Washington, D.C.:

for Ann Mazzullo

Alan I. Roberts
Associate Administrator
for Hazardous Materials Safety

JAN 30 1998
(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.

JAN 30 1998

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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