U.S. Department
of Transportation

**Research and
Special Programs
Administration**

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

DOT-E 8767 (EXTENSION)
ORIGINAL May 5, 1982
CORRECTED COPY

In accordance with 49 CFR 107.105 of the Department of Transportation (DOT) Hazardous Materials Regulations DOT-E 8767 is hereby extended for the party(ies) listed below by changing the expiration date in paragraph 10 to July 31, 1993. This change is effective from the issue date of this extension. All other terms of the exemption remain unchanged.

This extension applies only to party(ies) listed below based on the application(s) received in accordance with 49 CFR 107.105. This extension constitutes a necessary part of this exemption and must be attached to it.

J. Suzanne Hedgepeth
Alan I. Roberts
Associate Administrator
for Hazardous Materials Safety

OCT 29 1991
(DATE)

Dist: FHWA FRA FAA

EXEMPTION HOLDER	APPLICATION DATE
HR Textron, Inc. Pacoima, CA	August 23, 1991

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DOT-E 8767
(CORRECTED COPY)

1. Hydraulic Research, Textron, Pacoima, California is hereby granted an exemption from those provisions of this Department's Hazardous Materials Regulations specified in paragraph 5 below to manufacture, mark, and sell the packaging described in paragraph 7 for use in the transportation of the nonflammable, nonliquefied gases described in paragraph 3 below in commerce subject to the requirements specified herein. This exemption authorizes the use of a non DOT specification welded high pressure non-refillable cylinder in military weapons systems only, and provides no relief from any regulation other than as specifically stated.

2. BASIS. This exemption is based on the Hydraulic Research's application dated February 4, 1982, submitted in accordance with 49 CFR 107.103 and the public proceeding thereon; and its supplemental letter dated April 6, 1982.

3. HAZARDOUS MATERIALS (Descriptor and class). Helium, classed as nonflammable gas.

4. PROPER SHIPPING NAME (49 CFR 172.101). Helium.

5. REGULATION AFFECTED. 49 CFR 173.302(a), 175.3.

6. MODES OF TRANSPORTATION AUTHORIZED. Motor vehicle, rail freight, cargo-only aircraft.

7. SAFETY CONTROL MEASURES. Packaging prescribed is a non-DOT specification non-reusable (nonrefillable) cylinder having a 75 cubic inches maximum water capacity, made of AISI 4130 steel, in compliance with P/N 834600 dated 12/3/81. Design qualification tests as outlined in the February 4, 1982 application must have been performed prior to initial production. In addition, the cylinder must also comply with the following.

1. Service pressure and test pressure.

   The cylinder must have a marked service pressure of 7450 psi. The minimum test pressure is the maximum pressure of the contents at 130°F. The maximum test pressure must be as required in the paragraph on wall thickness.

2. Inspection.

   (a) Inspections and verifications must be performed by an independent inspection agency approved in writing by the Associate Director for Hazardous Materials Regulation (HMR) in accordance with 49 CFR 173.300a. Chemical analyses and tests as specified must be made within the United States unless otherwise approved in writing by the Associate Director for HMR in accordance with 49 CFR 173.300b.

   (b) The inspector must determine that all material used complies with the requirements of this exemption.

(c) The inspector must verify chemical analysis by making a chemical analysis or obtaining a certified chemical analysis from the material manufacturer for each heat of material (ladle analysis acceptable). If an analysis is not provided by the material manufacturer, a sample from each coil, sheet, or tube must be analyzed.

(d) The inspector must determine that each cylinder is made and marked in compliance with this exemption by:

(1) Making complete internal and external inspection.

(2) Verifying heat treatment as proper.

(3) Selecting of samples to be tested; and

(4) Witnessing all tests.

(e) The inspector must verify that the prescribed qualification tests have been performed with acceptable results prior to initial production.

3. Wall thickness.

(a) Minimum wall thickness shall be such that the wall stress at the minimum specified test pressure does not exceed the yield strength nor 75 percent of the minimum tensile strength of the steel, and shall not be over 105,000 psi.

(b) Calculations must be made by the formula:

$$S= [P(1.3D^2+0.4d^2)] /[D^2-d^2)$$

where
S=Wall stress in pounds per square inch;
P=Minimum test pressure prescribed
D=Outside diameter in inches
d=Inside diameter in inches

4. Safety devices.

Safety devices must meet the requirements of 49 CFR 173.34(d).

5. Heat treatment

(a) The completed cylinders must be uniformly and properly heated prior to tests. All cylinders must be inspected by the magnetic particle or dye penetrant method to detect the presence of quenching cracks. Any cylinder found to have a quenching crack must be rejected and may not be requalified.

6. Pressure tests.

(a) Each cylinder must be tested at an internal pressure of at least the test pressure and must be held at that pressure for at least 60 seconds.

(1) The leakage test must be conducted by submersion under water or by some other method that will be equally sensitive.

(2) If the cylinder leaks, or evidences visible distortion or any other defect, while under test, it must be rejected.

(b) One cylinder taken from each lot must be hydrostatically tested to destruction. The entire lot must be rejected if:

(1) A failure occurs at a gage pressure less than 16,556 psi.

(2) A failure initiates in a weld or the heat affected zone thereof; or

(3) A failure is other than in the sidewall of a cylinder longitudinal with its long axis.

(c) A "lot" is defined as the quantity of cylinders not exceeding 1000 cylinders successively produced per production shift (not exceeding 10 hours) having identical size, design, construction, material, heat treatment, finish, and quality.

7. Flattening test.

(a) One cylinder must be taken from each lot as defined above and subjected to a flattening test.

(1) The flattening test must be made on a cylinder that has been tested at test pressure.

(2) A ring taken from a cylinder may be flattened as an alternative to a test on a complete cylinder. The test ring must not include the heat affected zone or any weld.

(3) The flattening must be between 60 degrees included-angle, wedge shaped knife edges, rounded to a 0.5 inch radius.

(4) Cylinders and test rings must not crack when flattened so that their outer surfaces are not more than ten times wall thickness apart.

(b) If any cylinder or ring cracks when subjected to the specified flattening test, the lot of cylinders represented by the test must be rejected.

8. Rejected cylinders.

(a) If the cause for rejection of a lot is determinable, and if by test or inspection, defective cylinders are eliminated from the lot, the remaining cylinders may be qualified as a new lot.

(b) Repairs to welds are permitted. Following repair, a cylinder must pass the pressure test specified.

(c) If a cylinder made from seamless steel tubing fails the flattening test suitable uniform heat treatment must be used on each cylinder in the lot. All prescribed test must be performed subsequent to this heat treatment.

9. Markings.

(a) The markings required by this section must be durable and waterproof.

(b) Required markings are as follows:

(1) DOT-E 8767
(2) NRC.
(3) The service pressure
(4) The test pressure
(5) The registration number (M****) of the manufacturer.
(6) The lot number.
(7) The date of manufacture if the lot number does not establish the date of manufacture.
(8) The following statement: Federal law forbids transportation if refilled penalty up to $25,000 fine and 5 years imprisonment (49 U.S.C. 1809).

(c) The markings required by paragraph (b)(1) through (5) of this section must be in numbers and letters at least 1/8 inch high and displayed sequentially. For example:
DOT-E 8767 NRC 250/500 M1001.

8. SPECIAL PROVISIONS.

a. Shippers may use the packaging covered by this exemption pursuant to 49 CFR 173.22a.

b. A copy of this exemption must be carried aboard each aircraft used to transport packages covered by this exemption.

c. These cylinders must be used in military weapons systems only.

d. These cylinders must be shipped in strong outside packagings in accordance with 49 CFR 173.301(k).

9. REPORTING REQUIREMENTS. Any incident involving loss of contents of the package must be reported to the OHMR as soon as practicable.

10. EXPIRATION DATE. February 28, 1984.

Issued at Washington, D.C.:

MAY 5 1982

Alan I. Roberts
Associate Director for
Hazardous Materials Regulation
Materials Transportation Bureau

(DATE)

Address all inquiries to: Associate Director for Hazardous Materials Regulation, Materials Transportation Bureau, Research and Special Programs Administration, U.S. Department of Transportation, Washington, D.C. 20590. Attention: Exemptions Branch.

Dist: FAA, FHWA, FRA