U.S. Department
of Transportation

**Research and
Special Programs
Administration**

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

MAR 23 1999

DOT-E 6531
(THIRD REVISION)

EXPIRATION DATE: February 28, 2001

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: TAVCO, Inc.
Chatsowrth, CA

2. PURPOSE AND LIMITATIONS:

a. This exemption authorizes the manufacture, mark, sale and use of a welded, nonrefillable, non-DOT specification pressure vessel conforming with all regulations applicable to a DOT specification 39, except as specified herein, for the transportation in commerce of the materials authorized by this exemption. This exemption provides no relief from any Hazardous Materials Regulation (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. 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 §§ 173.302(a)(1) and 175.3 in so far as non-DOT specification packagings are authorized and portions of § 178.65 as specified herein.

5. BASIS: This exemption is based on the application of TAVCO, Inc. dated January 4, 1999, 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
Air, compressed	2.2	UN1002	n/a
Nitrogen, compressed	2.2	UN1066	n/a

7. SAFETY CONTROL MEASURES:

PACKAGING - Packaging prescribed is a non-DOT Specification nonrefillable, welded steel inside cylinder consisting of 2 hemispherical heads welded to a seamless or welded body having an outside diameter not in excess of 2.0 inches. Maximum charging pressure may not exceed 1600 psi at 701/4F. Each container must be as described in Tavco, Incorporated's Drawing No. 23711298, Revision R, dated November 24, 1970 on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA); and must be in accordance with the DOT Specification 39 (§ 178.65) cylinder except as follows:

§ 178.65(a) *Type, size, service pressure and test pressure.*

Each cylinder must be constructed by welding two hemispherical heads to a seamless or welded body. Marked service pressure must be 1,600 psia.

(1) *Size limitation*: Maximum water capacity may not exceed 25 cubic inches. Maximum diameter may not exceed 2.0 inches.

(2) *Test pressure*: At least two times the marked service pressure.

(3) * * *

§ 178.65(b) *Material.*

(1) Steel.

(i) SAE 4130.

(ii) Not applicable.

(iii) Completed cylinder must be heat treated and then quenched and tempered to provide the following mechanical properties. After heat treatment, the elongation and the tensile and yield strengths of the steel on one cylinder out of each lot (as defined in § 178.65(f)(3)) must be determined as prescribed in § 178.36(k)(2) and (3). Test specimens may be taken from sample pieces made of same material that are heat treated in the same manner as the production cylinders, if a full size specimen cannot be taken from a finished cylinder.

Ultimate tensile strength = 180 KSI to 200 KSI.
Yield Strength = 155 KSI to 175 KSI.
Elongation = 5%, minimum.

(iv) Longitudinal welds are authorized.

(2) Not applicable.

(3) and (4) * * *

§ 178.65(c) *Manufacture.*

(4) (added) After hydrostatic test, each cylinder must be subjected to magnetic particle or dye penetrant examination for defects.

§ 178.65(d) *Wall thickness.*

* * *

(1) Calculation of the stress for the cylinder must be made by the formula:

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

where

D is the outside diameter
E is 0.85 weld joint efficiency for longitudinal seams
P is burst pressure
S is the wall stress at burst and is 180 ksi maximum
d is the inside diameter

(2) Not applicable

(3) (added) The cylinder head must have at least the same thickness as the cylinder shell.

§ 178.65(f) *Pressure tests.*

(1) * * *

(2) * * *

(i) A failure occurs at a gage pressure less than 3 times the marked service pressure.

* * * * *

§ 178.65(f) *Flattening test.*

Not applicable.

§ 178.65(i) *Markings.*

Applies except that "DOT-39" is replaced by "DOT-E 6531". Paragraph (v) is not applicable and (viii) is replaced by the following statement: "Illegal to refill and transport".

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 modifications or changes are made to the package and it is offered for transportation in conformance with this exemption and the HMR.

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

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. Containers must be packed in strong outside wooden or fiberboard boxes conforming with § 173.301(k).

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo aircraft only, and passenger-carrying aircraft.

10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each aircraft used to transport packages covered by this exemption. The shipper shall furnish a copy of this exemption to the air carrier before or at the time the shipment is tendered.

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:

- All terms and conditions prescribed in this exemption and the Hazardous Materials Regulations, Parts 171-180.
- 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 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 Mazzulla

for Alan I. Roberts
Associate Administrator for
Hazardous Materials Safety

MAR 23 1999
(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.

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.

Copies of exemptions may be obtained from the AAHMS, U.S. Department of Transportation, 400 7th Street, S.W., Washington, DC 20590-0001, Attention: Records Center, 202-366-5046.

Dist: FAA, FRA, FHWA
PO: KFW