U.S. Department
of Transportation

**Research and
Special Programs
Administration**

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

FEB 1 6 2005

DOT-E 13560
(FIRST REVISION)

EXPIRATION DATE: December 31, 2006

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Texaco Ovonic Hydrogen Systems, L.L.C.
Rochester Hills, MI

2. PURPOSE AND LIMITATION:

a. This exemption authorizes the manufacture, marking, sale and use of hydrogen storage and dispensing systems used to power fuel cells. The hydrogen storage and dispensing systems utilize non-DOT specification seamless cylinders containing hydrogen absorbed in metal hydride. 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. 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 § 173.301(f) in that the non-DOT specification cylinder is fitted with pressure relief devices that do not meet the requirements of CGA S-1.1; § 173.301(d) in that the material within the cylinder has the potential to endanger the cylinder's service ability; and § 173.302a in that the non-DOT specification cylinder is not authorized for the materials in paragraph 6 except as specified herein.

5. BASIS: This exemption is based on the applications of Texaco Ovonic Hydrogen Systems dated April 2, 2004 and May 26, 2004, and additional information dated April 29, May 10, August 26, September 10, October 11, November 5, November 23, 2004 and February 9, 2005, submitted in accordance with § 107.105 and the public proceeding thereon.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Hazardous Materials Description			
Proper Shipping Name	**Hazard Class/ Division**	**Identi-fication Number**	**Packing Group**
Hydrogen absorbed in metal hydride	2.1	NA9279	N/A
Hydrogen in a metal hydride storage system	2.1	UN3468	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Prescribed packaging is a hydrogen storage and dispensing system incorporating non-DOT specification seamless cylinders containing hydrogen absorbed in metal hydride. The cylinders must be designed, constructed, tested and "U" stamped in accordance with Section VIII, Division 1, of the ASME Boiler and Pressure Vessel Code with a design margin of at least 3.5 to 1. Each cylinder must be equipped with an internal geometric configuration or other means that prevents the metal hydride from exerting detrimental forces on the cylinder. Each cylinder must be equipped with a rupture disk type pressure relief device in accordance with Section VIII, Division 1, of the ASME Code. The rupture disc must be rated at the maximum allowable working pressure of the cylinder.

(1) Aluminum cylinders must be in conformance with the following:

(i) Texaco Ovonic Hydrogen Storage System's L.L.C. (TOHS) drawing number DOT DOC 2, dated 11/10/03, TOHS drawing package TACOM-210-000, and other drawings and technical information on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA).

(ii) Material of construction: 6061-T6 aluminum alloy;

(iii) Maximum allowable working pressure of at least 2,500 psig at 70°F;

(iv) Maximum charged pressure while in transit of 750 psig; and

(v) Maximum water capacity of 50 pounds.

(2) Steel cylinders must be in conformance with the following:

(i) Texaco Ovonic Hydrogen Storage System's L.L.C. (TOHS) drawing number DOT DOC 1, dated 2/18/04, TOHS drawing package TACOM-205-000, and other drawings and technical information on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA).

(ii) Material of construction: SA-106B carbon steel;

(iii) Maximum allowable working pressure of at least 3,240 psig at 70°F;

(iv) Maximum charged pressure while in transit of 1,500 psig; and

(v) Maximum water capacity of 250 pounds.

b. TESTING - Each cylinder must be inspected by TOHS at least every three months in accordance with the procedure in TOHS Document #550004-2004 Vessel Wall Strain Monitoring of TACOM-100-100. The test records for this inspection performed on each cylinder every three months, must be maintained by TOHS and be made available to a DOT representative upon request.

c. MARKING

(1) Each cylinder must be marked as follows:

(i) "DOT-E 13560" as specified in §172.301(c);

(ii) "Aluminum" or "Steel" as applicable after the exemption number;

(iii) "Maximum charge pressure" followed by the pressure in psig; and

(iv) "Remove from service after MM/YY" (Where MM/YY is the month and year. The date must be 5 years after the manufacture date.)

(2) Each structural framework must be marked "DOT-E 13560" as specified in § 172.302(b) and (c).

d. OPERATIONAL CONTROLS

(1) Refilling must be performed by TOHS or by trained authorized personnel of the National Automotive Center of the Department of Defense.

(2) Up to six (6) aluminum cylinders may be manifolded together with up to two (2) steel cylinders per framework. Each cylinder must be equipped with a manual shut-off valve that must be closed during transit.

(3) Cylinders shall be permanently mounted within a high strength structural framework (frame) that safely secures the cylinders, components, and manifolding. The frame must be designed in accordance with the requirements specified in § 173.301(i). Additionally, the frame must be designed to withstand: a static force of eight times the weight of the assembly in three principal axes, applied individually; and a static force of seven times longitudinally, three times laterally, and three times vertically, the weight of the structure applied simultaneously.

(4) The mounted cylinders and entire hydrogen storage/dispensing system must be securely mounted on a truck and protected by side and roof panels.

(5) Any structural framework that will be used to transport the cylinders must have a Finite Element Analysis (FEA) on file with the Office of Hazardous Materials Exemptions and Approvals. The FEA must demonstrate the framework's ability to protect the cylinders from damage due to the loading conditions specified in paragraph 7.d.(3) of this exemption.

(6) No more than twelve (12) aluminum cylinders and four (4) steel cylinders authorized by this exemption may be transported per vehicle.

(7) Cylinders are authorized for use for five years from the date of manufacture. At the end of the authorized service life, cylinders must be removed from hazardous materials service, and the DOT markings moved or obliterated.

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 modification or change is made to the package or its contents 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. 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.

e. 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.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle.

10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each motor vehicle used to transport packages covered 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. 5101 et seq:

- All terms and conditions prescribed in this exemption and the Hazardous Materials Regulations, 49 CFR Parts 171-180.

- 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.

- 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 this exemption has expired or is otherwise no longer in effect.

12. REPORTING REQUIREMENTS: Shipments or operations conducted under this exemption are subject to the Hazardous Materials Incident Reporting requirements specified in 49 CFR §§ 171.15 - Immediate notice of certain hazardous materials incidents, and 171.16 - Detailed hazardous materials incident reports. In addition, the grantee(s) of this exemption must notify the Associate Administrator for Hazardous Materials Safety -- OHMEA, in writing, of any incident involving a package, shipment or operation conducted under terms of this exemption.

Issued in Washington, D.C.:

for Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety

FEB 16 2005
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: CWF/alb