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

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

FEB 7 2005

Ms. Nancy Fischer
Pacific Scientific Company
1800 Highland Avenue
Duarte, CA 91010

Dear Ms. Fischer:

Attached is the 13th revision of DOT-E 8299. Please note that an editorial change was made to paragraph 8.c by adding "for up to" between the words "use" and "twenty-four"; and "from" replaces "after" preceding "the date of manufacture". These changes were initiated by this office in order to clarify the exemption. If you have questions concerning the changed language, please feel free to contact Ryan Posten of this office at (202) 366-4535.

Sincerely,

Delmer F. Billings
Director
Office of Hazardous Materials
Exemptions and Approvals

U.S. Department
of Transportation

**Research and
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400 Seventh Street, S.W.
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DOT-E 8299
(THIRTEENTH REVISION)

EXPIRATION DATE: July 31, 2006

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Pacific Scientific Company
HTL/Kin-Tech Division
Duarte, California

2. PURPOSE AND LIMITATIONS:

a. This exemption authorizes the manufacture, mark, sale and use of a non-DOT specification cylinder conforming with all regulations applicable to a DOT specification 3HT, 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.

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

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR § 173.304a(a)(1) and § 175.3 in that a non-DOT specification cylinder is not authorized except as specified herein.

5. BASIS: This exemption is based on the application of Pacific Scientific dated July 19, 2004 submitted in accordance with § 107.109.

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6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Hazardous Material Description			
Proper Shipping Name	**Hazard Class/ Division**	**Identi-fication Number**	**Packing Group**
Helium, compressed	2.2	UN1046	N/A
Nitrogen, compressed	2.2	UN1066	N/A

7. SAFETY CONTROL MEASURES: Packaging prescribed is a non-DOT specification welded stainless steel cylinder manufactured in compliance with HTL drawings on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA), and with DOT Specification 3HT (§ 178.44) except as follows:

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

Welded spheres (two seamless hemispheres) or circumferentially welded cylinders (2 seamless drawn shells) with a water capacity (nominal) of not over 400 cubic inches and a maximum service pressure of 3,300 pounds per square inch.

§ 178.44(b) *Authorized steel.*

Type ARMCO Nitronic 40 (21-6-9) stainless steel with the following analysis is authorized with proper welding procedure.

CHEMICAL ANALYSIS

	PERCENT
Carbon	0.040 max.
Manganese	8.00/10.00
Phosphorus	0.060 max.
Sulfur	0.030 max.
Silicon	1.00 Max.
Chromium	19.00/21.50
Nickel	5.50/7.50
Nitrogen	0.15/0.40

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§ 178.44(d) *Manufacture.*

* * *

Each cylinder must be subjected to a process treatment after welding and before stress relieving. Process treatment must consist of hydrostatic pressurization at a pressure (maintained for at least 3 minutes) of at least 100% but not more than 110% of prescribed test pressure. The process treatment must be witnessed by the independent inspector.

§ 178.44(e) *Welding or Brazing.*

Welding, as prescribed in § 178.44(a) of this exemption, is authorized. All pressure welds must be 100 percent radiographed after the hydrostatic test.

§ 178.44(f) *Wall thickness.*

(1) Applies except that 112,500 psi is substituted for 105,000 psi at the end of the section.

(2) and (3) * * *

(4) Calculations for spheres must be made by the formula:

$$S = PD/4tE$$

where

E = 0.85 which must be applied to the girth weld area and heat zones. The zones must extend a distance of 6 times the wall thickness from the center of the weld.

E = 1.0 (for all other areas).

§ 178.44(g) *Heat treatment.*

The hemispheres and half cylinders may be stress relieved or annealed for forming. Welded cylinders must be stress relieved at a temperature of 900°F±25°F for one hour. Stress relieving is to be done after process treatment and before the hydrostatic test.

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§ 178.44(j) *Cycling tests.*

Applies except that cycle test on each lot is not required.

§ 178.44(l) *Flattening test.*

A flattening test must be performed on one sphere, taken at random out of each lot of 200 or less after the hydrostatic test, by placing the sphere between parallel plates on a press with the welded seam at right angles to the plate.

§ 178.44(m) *Physical tests.*

* * *

(Add) Physical test is not required on spheres or cylinders having a water capacity of 60 cubic inches or less.

(1) * * *

(2) * * *

(i) Applies except for substituting a gauge length of 2 inches.

* * * *

§ 178.44(n) *Magnetic particle inspection.*

Not required. Instead, each cylinder must be inspected using apparatus and procedures for liquid penetrant examination in accordance with ASTM E-165-95. Inspection must be performed externally on the finished cylinder after the hydrostatic test. Evidence of discontinuities, which in the opinion of the independent inspector may appreciably weaken or decrease the durability of the cylinder will be cause of rejection.

§ 178.44(p) *Acceptable results of tests.*

* * *

(1) Flattening required without cracking to ten times the wall thickness of the cylinder or to 50 percent of the original outside diameter for a sphere.

(2) Physical tests:

(i) Elongation at least 6 percent in gauge length of 24 times wall thickness, and at least 10 percent in gauge length of 2 inches.

(ii) Tensile strength must be at least 150,000 psi.

(3) Burst pressure must be at least 4/3 times the test pressure. Actual burst pressure must be recorded.

(4) Cycling: The design must be qualified by cycling three cylinders from zero to service pressure at a rate not to exceed ten cycles per minute to at least 50,000 pressurizations without evidence of distortion or failure. Each design change must be qualified by cycling at least one cylinder at the above rate and acceptance criteria.

§ 178.44(q) *Rejected cylinders.*

Repair of welded seams by welding prior to process treatment authorized; subsequent thereto cylinders must be heat treated and pass all prescribed tests.

§ 178.44(r) *Marking.*

Applies except that instead of DOT-3HT, cylinders must be marked DOT-E 8299 followed by the service pressure. Rejection elastic expansion is not required for cylinders having a water capacity of 60 cubic inches or less.

8. SPECIAL PROVISIONS:

a. Cylinders are subject to the use restrictions prescribed in § 173.302a(a)(2), except they may also be used in military weapons systems.

b. Cylinders must be shipped in strong outside packagings in conformance with § 173.301(a)(1).

c. Cylinders manufactured under this exemption are not authorized for use fifteen (15) years after the date of manufacture except cylinders which were manufactured under P/N 36200021-2 are authorized for use for up to twenty-four (24) years from the date of manufacture.

(1) Three cylinders from the first lot to reach a service life of 22 years from the date of manufacture must be subjected to and successfully pass the cycling and burst tests:

Each cylinder must be cycled from zero to service pressure at a rate not to exceed ten cycles per minute for at least 50,000 pressurizations without evidence of distortion or failure. Each cylinder must then be burst tested. The burst pressure must be at least 4/3 times the test pressure.

(2) A report must be submitted to the Office of Hazardous Materials Exemptions and Approvals and must contain the actual burst pressure and failure mode for each cylinder.

d. Each cylinder must be reinspected and hydrostatically retested every 5 years in accordance with § 180.209 as prescribed for DOT-3HT cylinders.

e. 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.

f. 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.

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

h. Each cylinder manufactured under the authority of this exemption must be marked with the registration symbol designated by the Office of Hazardous Materials Exemptions and Approvals for a specific manufacturing facility.

i. A current 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.

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 with furnish a current 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.
- 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 the 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.:

Robert A. McGuire
Associate Administrator for
Hazardous Materials Safety

FEB 7 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: SS/AM