



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

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

OCT 26 2004

DOT-E 12196
(FIFTH REVISION)

EXPIRATION DATE: September 30, 2006

1. GRANTEE: HR Textron Inc.
Pacoima, CA
2. PURPOSE AND LIMITATIONS:
 - a. This exemption authorizes the manufacture, marking, sale and use of a non-DOT specification stainless steel alloy cylinder conforming with all regulations applicable to a DOT specification 3AA cylinder, except as specified herein, for the transportation in commerce of the materials authorized by this exemption. This exemption provides no relief from the Hazardous Material 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 use as a component of a transport vehicle or other device, or other uses not associated with transportation in commerce.
 - c. Party status will not be granted to this exemption.
3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.
4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 173.302a(a)(1) and 175.3 in that a non-DOT specification cylinder is not authorized except as specified herein; and § 180.205 in that an alternative maintenance/inspection program is authorized.

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5. BASIS: This exemption is based on the application of HR Textron Inc., dated September 30, 2004 submitted in accordance with § 107.109.
6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Hazardous Materials Description			
Proper Shipping Name	Hazard Class/ Division	Identification Number	Packing Group
Nitrogen, compressed	2.2	UN1066	N/A
Rare gases and nitrogen mixtures, compressed	2.2	UN1981	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Packaging prescribed is a welded non-DOT specification cylinder having a maximum capacity of 50 cubic inches, constructed of 15-5 precipitation hardened (PH) stainless steel. The cylinder must be in conformance with HR Textron Drawing 803360, Rev. A, on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA). The cylinder must conform to the requirements of DOT Specification 3AA (§§ 178.35, and 178.37) except as follows:

§ 178.35(a) Compliance. Required in all details except as amended herein.

§ 178.35(e) Safety Devices. Each cylinder must be equipped with a valve containing a frangible disc type safety device. Each frangible disc must have a rated bursting pressure which does not exceed 90 percent of the minimum required test pressure of the cylinder. Discs with fusible metal backing are not permitted.

§ 178.35(f) Marking.

(1) * * *

(i) Instead of DOT-3AA, each cylinder must be marked "DOT E 12196" followed by the service pressure.

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§ 178.35(g) Inspectors Report. Inspector's report must be appropriately modified to reflect identification, and conformance with this exemption. A copy of the inspector's report on the first lot of cylinders produced must be submitted to OHMEA prior to initial shipment.

§ 178.37(a) Type, Size and Service Pressure.

(1) Welded stainless steel cylinders not over 1.8 pounds water capacity, and maximum service pressure is 3,000 psig at 70°F.

(2) Deleted

§ 178.37(b) Authorized Steel. Authorized material must be 15-5 PH stainless steel alloy. Material must conform to SAE Aerospace Material Specification (AMS) 5659H, with the following chemical composition:

<u>Element</u>	<u>min.</u>	<u>max.</u>
Carbon	--	0.07
Manganese	--	1.00
Silicon	--	1.00
Phosphorous	--	0.030
Sulfur	--	0.015
Chromium	14.00	15.50
Nickel	3.50	5.50
Columbium	5xC	0.45
Copper	2.50	4.50
Molybdenum	--	0.50
Tantalum	--	0.05

Check Analysis must conform to AMS 5659, Paragraph 3.1, Table 1.

§ 178.37(e) Welding or brazing. All seams of the cylinder must be fusion welded using electron beam welding with complete penetration of the joint. Openings in the packaging which are not integrally forged or machined must be provided with a fitting or boss of compatible stainless steel alloy attached to the cylinder by fusion welding.

Radiographic inspection of welds before heat treat must be performed in accordance with ASTM E-1742. Accept/reject criteria must be in accordance with x-ray

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standards for production, and repair welds (NAVSHIPS 250-692-2), Bureau of Ships, Navy Department, Washington, DC.

§ 178.37(g) Heat treatment. After welding, and x-ray, the completed cylinder must be uniformly, and properly heat treated prior to tests. Heat treatment of the cylinders of the authorized analysis must be as follows:

(1) Solution heat treat to Condition "A" followed by age hardening to condition 1025 in accordance with SAE-AMS-H-6875.

(2) After heat treat, all cylinders must be externally inspected by the dye penetrant inspection method in accordance with ASTM E-1417 to detect the presence of cracks. Any cylinder found to have a crack must be rejected, and may not be requalified. Evidence of discontinuities, which in the opinion of the independent inspector, may appreciably weaken or decrease the durability of the pressure vessel must be cause for rejection.

§ 178.37(j) Flattening Test.

(1) The flattening test on each production lot is not required.

(2) A flattening test on one cylinder of each new design must be in accordance with this section.

§ 178.37(k) Physical Tests.

(3) * * *

(ii) Applies except that the elastic extension calculations must be based on an elastic modulus of 28,500,000.

§ 178.37(l) Acceptable results for Physical and Flattening Tests.

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(1) Physical tests

(i) Elongation in the transverse direction (circumferentially) 8 percent minimum for a gauge length of 24t, and width of 6t. Reduction in area must be recorded.

(ii) Ultimate tensile strength is 155,000 psi minimum, yield strength is 145,000 psi minimum.

b. TESTING - Each cylinder must be reinspected and hydrostatically retested in accordance with the following alternate maintenance/inspection program in lieu of the retest requirements prescribed in § 180.205:

(1) Three cylinders from the first lot to reach a service life of 18 and 30 years from the date of manufacture must be subjected to and successfully pass the cycling and burst tests:

(i) 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 5/3 times the test pressure.

(ii) If any of the tested cylinders fail the cycling or burst tests, that lot must be rejected, or ten additional cylinders selected at random from the lot may be subjected to the cycling or burst tests. Should any of these ten cylinders fail the test, the entire lot must be rejected.

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

(2) Each air carrier using cylinders under this exemption must establish a written periodic maintenance/inspection program specifically for the cylinders covered by this exemption which must comply with the airframe and cylinder manufacturer's recommendations.

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The periodic maintenance/inspection program must be a supplementary part to the FAA certificate holder's manual as required under 14 CFR Subpart L § 121.369. A copy of the maintenance/inspection program for each air carrier must be made available to a DOT representative upon request.

(3) Each cylinder must be periodically inspected every three years as a minimum to ensure that the required internal pressure and weight of contents is maintained, and that the valving, safety relief devices, mounting brackets, and associated instrumentation are secure and acceptable for continued safe service.

(4) Any cylinder removed from an aircraft for any reason must be inspected to determine that the required internal pressure and weight of contents is within acceptable limits and that there is no visual evidence of degradation of the cylinder or attached appurtenances. Cylinders showing degradation or loss of contents must be retested and requalified as prescribed in § 180.205 for DOT 3AA cylinders except that determination of permanent expansion is not required. No repairs to the cylinder are authorized.

(5) Each air carrier using a cylinder covered by this exemption shall institute a monitoring program to collect information pertaining to discrepancies, and action taken on each cylinder under the maintenance/inspection program as well as detailed information on all cylinders in the population which must be retested as required by this exemption. The data must be entered on the "High Pressure Cylinder Maintenance Data Sheet" attached as Appendix A to this exemption.

c. DESIGN QUALIFICATION TESTS - Each new cylinder design must have a minimum burst pressure of 3.0 times service pressure and be tested as follows:

(1) Four (4) cylinders must be subjected to a burst test.

(i) Three cylinders must be subjected to 50,000 pressure cycles from 10 percent of service pressure to service pressure at a rate not to exceed 10 cycles per minute.

(ii) The cylinders must withstand the pressure cycles without any evidence of visually observable leakage or damage, which in the opinion of the Independent Inspector may have an adverse effect on the integrity of the cylinder. After successfully passing the cycling test, the three cycled cylinders and the uncycled cylinder must be burst. Pressure must be increased to failure at a rate not to exceed 200 psi per second. The pressure at the onset of failure must be recorded, as well as the burst pressure.

(iii) Cylinders that burst at over twice the hydrostatic test pressure may separate in two parts in the circumferential weld area.

(2) Burst tests are not required on each production lot.

d. OPERATIONAL CONTROLS -

(1) Cylinder service life may not exceed 35 years.

(2) Cylinders discharged for any reason must be retested as prescribed in § 180.205 for DOT 3AA cylinders except that determination of permanent expansion is not required. No repairs to the cylinder are authorized.

(3) The cylinders covered under this exemption are used exclusively as part of aircraft emergency door actuation systems as described in the HR Textron Inc. application on file with OHMEA.

(4) Each charged cylinder is installed as a part of a specific design type installation by the original airframe manufacturer, or in accordance with an installation procedure approved by FAA.

(5) Each cylinder must be identified by its part and serial number, and the DOT exemption number under which the cylinder is manufactured.

(6) Cylinders must be shipped in strong outside packaging in accordance with § 173.301(a)(9).

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. 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, rail freight, cargo aircraft, 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 must 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:

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

- o 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.
- o 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.

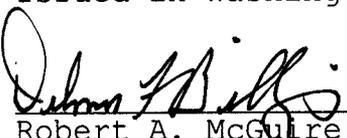
12. REPORTING REQUIREMENTS: The carrier is required to report any incident involving loss of packaging contents or packaging failure to the Associate Administrator for Hazardous Materials Safety (AAHMS) as soon as practicable. (Sections 171.15 and 171.16 apply to any activity undertaken under the authority 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 in Washington, D.C.

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(DATE)

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 Robert A. McGuire
 Associate Administrator for
 Hazardous Materials Safety

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