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

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

DOT-E 9419
(TENTH REVISION)

SEP 22 2003

EXPIRATION DATE: August 31, 2005

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: FIBA Technologies, Inc.
Westboro, MA

2. PURPOSE AND LIMITATIONS:

a. This exemption authorizes the transportation in commerce of certain gases in DOT 3AX, 3AAX, 3AA and 3T cylinders when retested by acoustic emission and ultrasonic examination (AE/UE) described in paragraph 7 below in place of the internal visual inspection and the hydrostatic retest required in § 180.205. 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.

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

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 180.209(a), the introductory paragraph, the Table; §§ 180.205(c), (f), (g), and (i); §§ 173.302a (b)(2), (3), and (4), in that the AE and UE are performed in place of the hydrostatic test and the internal visual inspection.

NOTE: This does not relieve the holder of this exemption from securing an approval for retesting cylinders from the Associate Administrator for Hazardous Materials Safety.

5. BASIS: This exemption is based on the application of FIBA Technologies dated December 12, 2002 submitted in accordance with § 107.105 and the public proceeding thereon and the July 8, 2003 renewal application submitted in accordance with § 107.109.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Hazardous Materials Description			
Proper Shipping Name	**Hazard Class/ Division**	**Identi- fication Number**	**Packing Group**
Liquefied or non-liquefied compressed gases, or mixtures of such compressed gases, classed as Division 2.1, Division 2.2, or Division 2.3 which are authorized for transportation in DOT 3AX, 3AAX, 3AA and 3T cylinders with minimum design wall thickness equal to or greater than 0.400 inch.	2.1, 2.2, or 2.3 as appro- priate	as appro- priate	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Packaging prescribed are DOT 3AX, 3AAX, 3AA or 3T cylinders, mounted on a tube trailer vehicle chassis or a tube module equipped with a frame that is subjected to periodic retesting, reinspection and marking prescribed in §§ 180.205 and 180.209, except that each cylinder is examined by acoustic emission and ultrasonic (AE/UE) in lieu of hydrostatic pressure test and internal visual inspection. The minimum design wall thickness of DOT 3AX, 3AAX, 3AA and 3T cylinders must be equal to or greater than 0.400 inch. Portable DOT 3A and 3AA cylinders are not covered under this exemption. Each cylinder must be retested and marked in accordance with the procedures specified in the FIBA application for exemption on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA) and as prescribed in this exemption.

b. TESTING - Cylinders must be retested at least once every five (5) years.

(1) Acoustic Emission (AE) Equipment: The AE equipment must be accordance with the specification described in the FIBA application on file with OHMEA and as prescribed in this exemption.

(i) Power supply, signal cable, signal processor and couplant must meet all requirements of the American Society for Testing and Materials (ASTM), E 1419-96 Standard Test Method for Examination of Seamless, Gas-Filled, Pressure Vessels Using Acoustic Emission.

(ii) AE Sensors must meet all requirements of ASTM, E 1419-96 except the broad band sensor must have the frequency band of 20 KHz to 2.0 MHz.

(2) AE Calibration and Standardization: Calibration and AE equipment performance and test procedure must be in accordance with ASTM, E 1419-96 and the FIBA test method on file with OHMEA, except as specifically stated herein:

(i) System performance check described in ASTM E 1419-96 will be performed by pencil lead break or electronic pulsar on the cylinder surface at a minimum distance of 4-inch (10-cm) from the sensor. The AE signal for each sensor during performance check must have a sensitivity equal or greater than 70 dBV.

(ii) Each acoustic emission (AE) site on the cylindrical portion of each tube which produces five or more valid events within an 8 inch (203 mm) axial distance must be subjected to an ultrasonic examination (UE) as prescribed herein. Each AE site on tube ends (i.e. sections of the tube which lie outboard of the sensors) which produces five or more events which hit both sensors and which had 43dB or greater peak amplitude at the "first hit" sensor, must be subjected to UE.

(3) Ultrasonic Examination (UE) Equipment (Apparatus) The UE equipment must be accordance with the specification described in ASTM E 2223-02 "Examination of Seamless, Gas Filled, Steel Pressure Vessels, Using Angle Beam Ultrasonics".

(i) Each search unit used must have the appropriate frequencies (1-5 MHz) and refracted angle (45 - 75°) for the material and geometry of the cylinder that is being examined.

(ii) Each search unit must detect and display the indication from the notch on reference ring at the maximum distance to be used during the examination.

(iii) The search unit must comprise a transducer mounted on a plastic wedge that is designed to have continuous acoustic coupling between search unit and the cylinder wall.

(4) UE Standardization Ring With Reference Notches (Reference Ring) - The Standardization Ring must be prepared in accordance with specification described in ASTM E 2223-02. A separate reference ring must be prepared for each DOT specification cylinder that is being examined under this exemption.

(5) UE Standardization Procedure - The UE equipment must be standardized for each cylinder type by using the Standardization Ring and in accordance with procedure described in ASTM E 2223-02.

(6) UE Procedure - The UE of each cylinder must be in accordance with the ultrasonic examination described in ASTM E 2223-02.

(7) Rejection criteria - The rejection criteria as established during standardization for the cylinder retested under this exemption is a flaw (crack) with a maximum depth less than or equal to 25% of the minimum design wall thickness.

When a cylinder is rejected, the retester must stamp a series of X's over the exemption or DOT specification number and marked test pressure, or stamp "CONDEMNED" on the shoulder, or neck using a steel stamp, and must notify the cylinder owner, in writing, that the cylinder is rejected and may not be filled with hazardous material for transportation in commerce. Alternatively, at the direction of the owner, the retester may render the cylinder incapable of holding pressure.

c. Marking -

(1) The exterior of the trailer cabinet of the vehicle chassis to which the cylinders are affixed must be marked with letters at least 2 inches high on a contrasting background "DOT-E 9419".

(2) An exterior tube on each side of a tube module must be marked with letters at least 2 inches high on a contrasting background "DOT-E 9419".

(3) The current retest date must be marked on the rear bulkhead inside the trailer cabinet at approximately eye level above the withdrawal valve for tube trailers and on the bulkhead near the withdrawal valve for tube modules. In the event retest dates of cylinders differ in a trailer cluster, the retest date displayed will be that of the oldest retest date, meaning the date of the retest that must occur first.

d. Report - A report must be generated for each cylinder that is examined. The AE and UE reports must include the following:

(1) AE and UE equipment, model and serial No.
(2) Specification of the standard reference used to UE the cylinder. Standard reference (calibration ring) must be identified by serial number or other stamped identification marking.
(3) Cylinder serial number and type.
(4) Maximum allowable filling pressure.
(5) Minimum prescribed sidewall.
(6) Number of events at each location.
(7) Pressure associated with each event.
(8) Description of each AE event (amplitude, duration, energy, etc.)
(9) Size of each defect measured (length and depth).
(10) Type of each defect measured (crack, pitting,etc.)
(11) Defect location relative to each sensor.
(12) Defect angular location defined by clock direction(3, 5, or 9 O'clock)
(13) Defect location relative to sidewall (interior, outer surface, inner surface).
(14) AE and UE technicians' name and certification level

(15) Test Date
(16) Acceptance/rejection results.
(17) The AE and UE reports must be on file at the test site, and made available to a DOT official when requested.

e. Personnel Qualification - Each person who performs retesting or who evaluates or certifies retest results must meet the following requirements:

(1) Project Manager - is the senior manager of FIBA responsible for compliance with DOT regulations including this exemption. Additionally, the project manager must ensure that each operator and senior review technologist maintain the required ASNT certification.

(2) The personnel responsible for performing cylinder retesting under this exemption must be qualified to an appropriate Level (Level I, II or III)- acoustic emission and ultrasonic examination (AE/UE)in accordance with the American Society for Nondestructive Testing (ASNT) Recommended Practice SNT-TC-1A-1996 depending upon the assigned responsibility as described below:

(i) As a minimum, a Level II Operator must perform system startup, calibrate the system, and review and certify the test results when a written acceptance and rejection criteria for cylinders have been provided by a Senior Review Technologist. Based upon written criteria, the Level II Operator may authorize cylinders that pass the retest to be marked in accordance with paragraph 7(c) of this exemption. However, a person with Level I certification may perform a system startup, check calibration, and perform AE/UE under the direct guidance and supervision of a Senior Review Technologist or a Level II Operator, either of whom must be physically present at the test site so as to be able to observe examination conducted under this exemption.

(ii) Senior Review Technologist (SRT) - is a person who reviews overall test results, provides supervisory training and technical guidance to operators, and reviews and verifies the retest results. A SRT must have a Level III Certification in AE/UE, and a thorough understanding of the HMR pertaining to the re-qualification and reuse of the DOT cylinders authorized under this exemption. The SRT must prepare and submit the reports required in paragraphs 7(d) and annually verify that the AE/UE program is being operated in accordance with the requirements of this exemption.

f. OPERATIONAL CONTROLS -

(1) No person may perform inspection and testing of cylinders subject to this exemption unless -

(i) that person is an employee or agent of FIBA Service Company and has a current copy of this exemption at the location of such inspection and testing, and

(ii) complies with all the terms and conditions of this exemption.

(2) The marking of the retester's symbol on the cylinders certifies compliance with all of the terms and conditions of this exemption.

(3) Each facility approved by OHMEA to test cylinders under the terms of this exemption must have a resident operator with at least a Level II Certification in AE/UE.

8. SPECIAL PROVISIONS:

a. Cylinders retested in accordance with paragraph 7 above may be charged to 110 percent of marked service pressure in accordance with § 173.302a(c).

b. The total number of cylinders tested under this exemption must be reported by type (i.e. 3AAX, 3T) and age. These results must be summarized and reported to DOT on an annual basis. A summary of the test results at each facility must be reported (on CD rums or paper) to the Associate Administrator for Hazardous Materials Safety annually to

assess the effectiveness of the test program. The summary must include the total number of cylinders tested under this exemption grouped by type (e.g. 3AX, 3AAX), size and age. The summary must include the number of cylinders accepted or rejected. For any rejected cylinder, the defect causing the rejection must be fully characterized and profiled (i.e. stress corrosion cracking, general corrosion etc.) And the specific size of the defect should be determined (i.e. length, depth, width, area etc.).

c. A statement of qualifications, for each "qualified AE/UE tester" used under this exemption and information in support thereof, must be maintained by FIBA. The location of this statement, for each "qualified AE/UE tester", must be identified to the Office of Hazardous Materials Exemptions and Approvals.

d. A person who is not a holder of this exemption who 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 reoffered for transportation in conformance with this exemption and the HMR.

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

f. Motor carriers operating under the terms of this exemption must have a "Satisfactory" or "Conditional" safety rating as prescribed in 49 CFR Part 385.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight and cargo vessel.

10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each cargo vessel or 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, 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 in Washington, D.C.:

Robert A. McGuire
for Associate Administrator for
Hazardous Materials Safety

SEP 22 2003
(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.

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