

January 25, 2007



U.S. Department
of Transportation

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

**Pipeline and Hazardous
Materials Safety Administration**

DOT-SP 11916
(SEVENTH REVISION)

EXPIRATION DATE: February 28, 2010

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: CP Industries, Inc.
McKeesport, PA
2. PURPOSE AND LIMITATION:
 - a. This special permit authorizes the use of certain DOT Specification 3A, 3AX, 3AA or 3AAX cylinders that are retested by a one hundred percent (100%) ultrasonic examination (UE) procedure described in paragraph 7 in lieu of the internal visual inspection and the hydrostatic retest for the transportation in commerce of the compressed gases listed in paragraph 6. This special permit provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein.
 - b. The safety analyses performed in development of this special permit 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.
 - c. No party status will be granted to this special permit.
3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 180.205(c), (f) and (g); §§ 173.302a(b)(2), (4) and (5) in that an ultrasonic examination (UE) performed in lieu of the specified hydrostatic pressure test and internal visual inspection is not authorized, except as specified herein.

NOTE: This does not relieve the holder of this special permit from securing and maintaining a valid approval for retesting cylinders from the Associate Administrator for Hazardous Materials Safety.

5. BASIS: This special permit is based on the application of CP Industries dated October 31, 2005, submitted in accordance with § 107.109 and additional information dated November 8, 2006.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Proper Shipping Name/ Hazardous Materials Description	Hazard Class/ Division	Identi- fication Number	Packing Group
Liquefied or nonliquefied compressed gases, or mixtures of such gases which are authorized in the HMR for transportation in DOT Specification 3A, 3AX, 3AA, or 3AAX cylinders with outside diameters greater than or equal to 22 inches.	As Appro- priate	As Appro- priate	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Prescribed packaging is a DOT Specification 3A, 3AX, 3AA or 3AAX cylinder (tube) with an outside diameter greater than or equal to 22 inches that is subjected to periodic retesting, reinspection and marking prescribed in § 180.205, except that the cylinder is examined by ultrasonic examination in lieu of the hydrostatic pressure test and internal visual inspection prescribed in §§ 180.205(c), (f), and (g). Each cylinder must be retested and marked in accordance with the procedure described herein and Appendix I of CP Industries procedure No. CP-QC-4001D, Rev.4 (Dated 3-14-2000), on file with the Office of Hazardous Materials Special Permits and Approvals (OHMSPA).

b. Ultrasonic equipment and Performance. The ultrasonic equipment performance must conform to Appendix I of CP Industries, procedure No. CP-QC-4001D, Rev.4 (Dated 3-14-2000) and as prescribed in this special permit. The UE equipment incorporates multiple transducers arranged to perform straight and angle beam examinations. The ultrasonic pulses must enter into the cylinder wall in both longitudinal, both circumferential directions and normal to the cylinder wall to ensure 100 percent coverage of the cylinder wall. The system must be set-up to perform longitudinal ultrasonic angle beams from the cylinder shoulder down to the cylinder base that includes sidewall-to-base transition (SBT) area and from the cylinder base up to the cylinder shoulder. Also the system must be set-up to perform circumferential ultrasonic angle beams in both clockwise and counterclockwise rotation around the cylinder. All defects (such as isolated pits and line corrosion) must be detected and measured. The transducers must be arranged so that the ultrasonic beams are aimed at a single location in the cylinder wall and all beams enter and exit at their respective location. Search units of 1 to 5 MHz nominal frequency and 1/4" to a 1" diameter must be used during ultrasonic examination. The equipment must continuously monitor acoustic coupling between the transducer assembly and cylinder wall to assure 100% cylinder wall coverage during the UE. It must be equipped with a sensor that indicates a lack of coupling. This device must be an integral part of the test equipment design incorporating Lack-of-Expected-Response (L.E.R.). If coupling is lost or compromised the operator must either terminate the test and re-examine the cylinder or complete the test and re-examine the areas where L.E.R. occurred. All areas re-examined must be documented in the report and approved by the Senior Review Technologist (SRT).

c. Calibration Standards.

(1) A cylinder section used as a calibration standard must be of the same nominal diameter, surface finish and metallurgical condition as the cylinders under the test. Prior to machining for calibration defects and the minimum wall thickness, the average minimum wall thickness for the calibration cylinder must be determined by means of an independent method. The calibration cylinder must be machined with defects simulating those that occur during service conditions, such as a reduction in wall thickness (area corrosion),

isolated pits, and line corrosion.

(2) The calibration cylinder must have a minimum of two different thickness steps machined in it. The artificial defects for reduction in wall thickness (area corrosion) must be 2.375-inch diameter and less than or equal 1/5 of the design minimum wall thickness (t_m). The remaining wall thickness must conform to the design minimum wall for a cylinder under the test. The artificial defects for isolated pits must be 1/4-inch diameter and less than or equal 1/3 of the t_m in depth. The artificial defects for line corrosion must include a minimum of two pits (1/4-inch diameter by 1/5 of t_m in depth). The pits for simulating line corrosion must be adjacent to each other. A certification statement signed by a person certified as a Level III operator (in UT) must be available for inspection for each calibrated cylinder at each site where testing is performed. The certification statement must include drawing, dimensions and location of each simulated defect.

d. System Calibration. System calibration must be performed using the calibration standards referenced in paragraph 7.c. of this special permit. The equipment calibration and set up for testing must be such that simulated defects specified on the calibration standards are detected and the following simulated defects must be rejected:

(1) In any area larger than 4.4 in² (or 2.375 inch diameter) the maximum wall stress calculated from the following formula

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

where:

S = wall stress in pounds per square inch;
P = minimum test pressure in pounds per square inch;
D = outside diameter in inches;
d = $D - 2t$, where t = minimum wall thickness determined by ultrasonic testing, in inches; exceeds 58,000 psi for DOT-3A and 3AX or 73,000 psi for DOT-3AA and 3AAX Specification cylinders.

(2) An isolated pit that is deeper than 1/4 of the design minimum wall thickness (t_m) and larger than 1/4-inch diameter.

(3) Line corrosion deeper than 1/5 of the design minimum wall thickness (t_m) and longer than 1/4-inch in length (the length of a line corrosion is measured from a center of first pit to the center of the last pit).

(4) Hand held ultrasonic testing equipment used for secondary ultrasonic examination (contact or immersion) must be calibrated in accordance with ASTM E 213-99.

e. Test Procedures.

(1) A written test procedure for performing UT examination of cylinders under the terms of this special permit must be at each facility performing UT examination. At a minimum, this procedure must:

(i) include a description of the test set-up; test parameters; transducer model number, frequency, and size; transducer assembly; couplant used; system calibration method and threshold gain used during the test; and other pertinent information such as additional gain used during the UT examination to confirm the defects.

(ii) require recalibration of the test equipment when ultrasonic examination of 50 cylinders has been completed, or a time period of more than 4 hours has elapsed since equipment calibration, whichever occurs first. The equipment must be recalibrated in accordance with the requirements of paragraph 7.d. of this special permit.

(iii) be made available to a DOT official when requested. Any change to the written procedure must be submitted to OHMSPA as soon as practicable.

(2) The equipment may not allow testing of a cylinder unless the system has been properly calibrated.

(3) Rotational speed of a calibration piece must be such that all artificial defects are adequately detected, measured and recorded.

(4) The area of ultrasonic examination (UE) coverage must be 100% of the cylindrical section to a point three inches beyond the point of tangency with the hemispherical heads.

(5) Surface of the cylinder to be examined must be free of loose material such as scale, and dirt.

(6) The rotational speed of the cylinder under UE must not exceed the rotational speed used during the calibration.

f. UE Acceptance/Rejection Criteria. A cylinder with any of the following defects must be rejected:

(1) The measured wall thickness is less than the calculated design minimum wall thickness using a maximum allowable stress of 58,000 psi for 3A cylinders and 73,000 psi for 3AA cylinders for the area described in paragraph 7.d.

(2) Any isolated pit greater than or equal to the dimensions described in paragraph 7.d.(2) must be set aside for secondary (manual) UE.

If the isolated pit is deeper than 1/4 of the design minimum wall thickness t_m and larger than 1-inch diameter (or 0.78 in²), the cylinder must be rejected.

(3) Any line corrosion greater than or equal to the dimensions described in paragraph 7.d.(3) must be set aside for secondary (manual) UE. If the line corrosion is deeper than 1/5 of t_m and longer than 2.375-inch in length, the cylinder must be rejected.

g. Rejected cylinders. When a cylinder is rejected, the retester must stamp a series of X's over the DOT Specification number and marked service pressure or stamp "CONDEMNED" on the shoulder, top head, 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.

h. Marking. Each cylinder passing retests under the provisions of this special permit must be marked as

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prescribed in § 180.205(i)). In addition, each cylinder must be marked UE, in characters not less than 1/4 inch high at a location close to the retester's marking.

- i. UE Report. A report must be generated for each cylinder that is examined. The UE report must include the following:
 - (1) UE equipment, model and serial No.
 - (2) Transducer specification, size, frequency and manufacturer
 - (3) Specification of the calibration standard used to complete UE
 - (4) Cylinder serial no. and type
 - (5) UE technicians' name and certification level
 - (6) Date of the UE
 - (7) All recorded defects (pitting, corrosion, etc.)
 - (8) Brief description of the UE acceptance/rejection result
 - (9) Size (depth, diameter, length) of each isolated pit and/or line corrosion for each cylinder which was removed for a secondary UE
 - (10) The UE report must be on file at the test site, and made available to a DOT official when requested

- j. Personnel Qualification: Each person who performs retesting, and evaluates and certifies retest results must meet the following qualification requirements:
 - (1) Project Manager/Director of Product Technology - is the senior manager of CPI responsible for compliance with DOT regulations including this special permit. Additionally, the project manager must ensure that each operator and senior review technologist maintains the required certifications described herein.
 - (2) The personnel responsible for performing cylinder retesting under this special permit must be qualified to an appropriate Ultrasonic Testing Certification Level (Level I, II or III) in accordance with the American Society for Nondestructive Testing (ASNT) Recommended Practice SNT-TC-1A depending upon the assigned responsibility as described below:
 - (i) System startup and calibration must be performed by a Level II operator. A Level II operator may review and certify test results.

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However, written procedures for accepting/rejecting a cylinder must be provided by the 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.h of this special permit. A person with Level I certification may perform a system startup, check calibration, and perform ultrasonic testing 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 testing conducted under this special permit.

(ii) Senior Review Technologist (SRT) - is a person who provides written UE procedure, supervisory training, examinations (Level I and II) and technical guidance to operators, and reviews and verifies the retest results. A SRT must have a thorough understanding of the DOT Regulations (49 CFR) pertaining to the requalification and reuse of DOT cylinders that are authorized under both this special permit and ASNT Recommended Practice SNT-TC-1A and must possess either:

- A. A Level III certification from ASNT in Ultrasonic Testing; or,
- B. A Professional Engineer (PE) License with a documented experience for a minimum of 2 years experience in Non-Destructive Evaluation (NDE) of pressure vessels or pipelines using the ultrasonic examination technique; or,
- C. A PhD degree in a discipline of Engineering/Physics with documented evidence of experience in Non-Destructive Evaluation (NDE) of pressure vessels or pipelines using the ultrasonic examination technique or research/thesis work and authoring/co-authoring of technical papers published, in recognized technical journals, in the fields of ultrasonic testing methods.

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- D. The SRT must prepare and submit the reports required in paragraphs 7.i. and annually verify that the UE program is being operated in accordance with the requirements of this special permit.

The most recent copies of certification (e.g. ASNT Level III, P.E.) must be available for inspection at each requalification facility.

k. OPERATIONAL CONTROLS.

(1) No person may perform inspection and testing of cylinders subject to this special permit unless:

(i) that person is an employee of CPI and has a current copy of this special permit at the location of such inspection and testing;

(ii) that person complies with all the terms and conditions of this special permit.

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

(3) Each facility approved by OHMSPA to test cylinders under the terms of this special permit must have a resident operator with at least an ASNT Level II Certification in UT.

(4) The UE equipment and operating procedures identified in this special permit are only authorized for use when the approved SRT is available (or alternatively available by telephone or other electronic means) at each facility operating under the special permit.

(5) Notwithstanding the requirements of a RIN Approval for notification of address and personnel changes, any change in Project manager or SRT, with appropriate documentation (i.e. ANST certification), must be submitted to and acknowledged in writing by OHMSPA immediately.

8. SPECIAL PROVISIONS:

a. The ultrasonic examination data, results, and additional technical information deemed pertinent in successful

application of the UE shall be reported to OHMSPA. The purpose of this information is to determine whether certain examination procedures and criteria require modification. For any rejected cylinder, the defect causing the rejection must be fully characterized and profiled. That is, the specific type of defect should be identified (i.e. isolated pits, line corrosion or SBT crack) and the specific size of the defect should be determined (i.e. length, depth, width, diameter, area, etc.). The cylinder type, size, minimum design wall thickness, age, etc. of the rejected cylinder must be reported. The ultrasonic signal profile should be reported for any defect causing the cylinder to be rejected. These results must be summarized and reported to OHMSPA on an annual basis. The special permit holder must submit to OHMSPA an evaluation of the effectiveness of the ultrasonic examination program authorized by this special permit as part of any request to renew the special permit submitted in accordance with § 107.109.

b. The total number of cylinders tested and rejected under this special permit must be reported to OHMSPA by cylinder class and age. These results must be summarized and reported on an annual basis.

c. Offerors may use the cylinders specified and tested in accordance with the provisions of this special permit for the transportation in commerce of those hazardous materials specified herein, provided no modifications or changes are made to the cylinders, and all terms of this special permit are complied with.

d. Shippers using the cylinders covered by this special permit must comply with the provisions of this special permit, and all other applicable requirements contained in 49 CFR Parts 100-185.

e. In order to authorize a cylinder for a special filling limit (+ marking) stated in section 173.302a(b) the cylinder must meet the following:

1. The cylinder must meet the requirement of 173.302a(b) (1).
2. The wall thickness of the cylinder is equal to or greater than the design minimum wall thickness as it is described in the accept/reject criteria of this special permit for each cylinder type.

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- f. Transportation of Division 2.1 (flammable gases) and Division 2.3 (gases which are poisonous by inhalation) are not authorized aboard cargo vessel or aircraft unless specifically authorized in the Hazardous Materials Table (§ 172.101).
- g. Transportation of oxygen is only authorized by aircraft when in accordance with § 172.102(c)(2) Special Provision A52 and §§ 175.85(h) and (i).
- h. Packages permanently marked 'DOT-E 11916', prior to October 1, 2007 may continue to be used under this special permit for the remaining service life the package or until the special permit is no longer valid. Packages marked after October 1, 2007 must be marked 'DOT-SP 11916'.
- i. Shipping papers displaying 'DOT-E 11916' may continue to be used until October 1, 2007, provided the special permit remains valid.
9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel, cargo aircraft only.
10. MODAL REQUIREMENTS: See paragraph 8.g. for restrictions by aircraft.
11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this special permit 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 special permit and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
 - o Persons operating under the terms of this special permit 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 special permit must receive training on the requirements and conditions of this special permit in addition to the training required by §§ 172.700 through 172.704.

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No person may use or apply this special permit, including display of its number, when this special permit has expired or is otherwise no longer in effect.

Under Title VII of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)- 'The Hazardous Materials Safety and Security Reauthorization Act of 2005' (Pub. L. 109-59), 119 Stat. 1144 (August 10, 2005), amended the Federal hazardous materials transportation law by changing the term 'exemption' to 'special permit' and authorizes a special permit to be granted up to two years for new special permits and up to four years for renewals.

12. REPORTING REQUIREMENTS: Shipments or operations conducted under this special permit 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 special permit must notify the Associate Administrator for Hazardous Materials Safety, in writing, of any incident involving a package, shipment or operation conducted under terms of this special permit.

Issued in Washington, D.C.:



for Bob Richard
Deputy Associate Administrator
for Hazardous Materials Safety

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Materials Safety Administration, Department of Transportation, Washington, D.C. 20590. Attention: PHH-31.

Copies of this special permit may be obtained by accessing the Hazardous Materials Safety Homepage at http://hazmat.dot.gov/sp_app/special_permits/spec_perm_index.htm Photo reproductions and legible reductions of this special permit are permitted. Any alteration of this special permit is prohibited.

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