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U.S. Department
of Transportation

East Building, PHH-30
1200 New Jersey Avenue S.E.
Washington, D.C. 20590

**Pipeline and Hazardous
Materials Safety Administration**

DOT-SP 16343
(THIRD REVISION)

EXPIRATION DATE: 2023-01-31

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: Hexagon Digital Wave LLC
Englewood, CO
2. PURPOSE AND LIMITATION:
 - a. This special permit authorizes the extension of the service life of certain composite cylinders owned by the US Navy and used for inflating Navy inflatable crafts which are subjected to requalification procedures and operational controls that are defined in this special permit. This special permit provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein. The most recent revision supersedes all previous revisions.
 - b. The safety analyses performed in the development of this special permit only considered the hazards and risks associated with the 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(g) in that alternative testing is authorized.
5. BASIS: This special permit is based on the application of Hexagon Digital Wave LLC dated February 19, 2019 and submitted in accordance with § 107.109.

Tracking Number: 2019025865

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6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Hazardous Materials Description			
Proper Shipping Name	Hazard Class/ Division	Identi- fication Number	Packing Group
Air, compressed (air containing up to 39% by volume oxygen)	2.2	UN1002	N/A
Nitrogen, compressed	2.2	UN1066	N/A

7. SAFETY CONTROL MEASURES:

a. **PACKAGING:** Packaging prescribed are limited to certain U.S. Navy owned, non-DOT specification composite cylinders made under DOT-CFFC (Basic Requirements for Fully Wrapped Carbon Fiber Reinforced Aluminum Lined Cylinders) and manufactured under special permits DOT-SP 10915, DOT-SP 10945, and DOT-SP 11194 used exclusively in Navy inflatable craft service and maintained under the Navy standard operating procedure as described in the Digital Wave Corporation application submitted to the Office of Hazardous Materials Safety Approvals and Permits Division (OHMSAPD).

Cylinders may be considered for an extended service life not exceeding 30 years after the original manufacturing date of the cylinder. Each cylinder considered for extended service life must be requalified by Modal Acoustic Emission (MAE) in accordance with the procedures specified in the Digital Wave Corporation (DWC) application for special permit on file with OHMSAPD and as prescribed in this special permit. Cylinders passing the MAE requalification may be marked DOT-SP 16343 and authorized for an additional 5 years. Cylinders marked DOT-SP 16343 must be successfully requalified once every 5 years using MAE in order to remain in service for a maximum service life of 30 years from the date of original manufacture.

b. **TESTING (Requalification):** Each cylinder must be requalified once every five (5) years by an approved facility that has a DOT Requalifier Identification Number (RIN) from the

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OHMSAPD for requalification of DOT CFFC using Modal Acoustic Emission (MAE) testing in lieu of hydrostatic testing and in accordance with following:

(1) **Visual Examination:** Prior to MAE testing, each cylinder must receive an internal and external visual examination in accordance with CGA Pamphlet C-6.2, Standards for Visual Inspection and Requalification of Fiber Reinforced High Pressure Cylinders. Cylinders that do not meet the visual inspection criteria must be condemned.

(2) **MAE Testing:** MAE equipment specification, calibration, testing procedure and accept/reject criteria must be in accordance with DWC special permit, SP 15720, on file with OHMSAPD.

(3) **Action for Rejected Cylinders:** When a cylinder is rejected, the retester must securely affix to the cylinder a durable label with the word "CONDEMNED" over coated with epoxy near, but not obscuring the original cylinder manufacturer's label (marking).

Alternatively, at the direction of the owner, the requalifier may render the cylinder incapable of holding pressure.

c. **Marking:** Each cylinder that has passed the requalification described in this special permit for extended service-life, must be marked "DOT-SP 16343". The new "DOT-SP 16343" marking must cover the current special permit marking (DOT-SP 10915, DOT-SP 10945, or DOT-SP 11194) and then be epoxy coated to ensure it is permanently attached to the cylinder. The DOT-SP 10915, DOT-SP 10945, or DOT-SP 11194 marking and all indications of the identity of the party that manufactured the cylinder under DOT-SP 10915, DOT-SP 10945, or DOT-SP 11194 must be completely obscured. All marking, including requalification date (month/year), must be permanently placed on the cylinder as specified in paragraph § 180.213. In addition, each cylinder must be marked "MAE", in characters not less than 1/4". The marking of the RIN number on the cylinder certifies compliance with all of the terms and conditions of this special permit.

d. **Report:** A report must be generated for each cylinder that is tested. The MAE reports must include the following:

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- (1) RIN
- (2) MAE equipment, model and serial number
- (3) Cylinder manufacture date, serial number, special permit number (DOT-SP 10915, DOT-SP 10945, DOT-SP 11194 or DOT-SP 16343) and marked service pressure
- (4) MAE technicians' name and certification level
- (5) Test date
- (6) Decay rate B values
- (7) Event energies exceeding the fiber bundle failure criteria, if any
- (8) Background energy oscillation pressure
- (9) Visual inspection results (Pass/Fail)
- (10) Acceptance/rejection results. If cylinder is rejected, include each cause of rejection criteria as described in 7.f. of DOT-SP 15720.

The MAE reports must be on file at the test site, and made available to a DOT representative 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 Digital Wave Corporation (DWC) 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 shall be qualified to an appropriate Level (Level I, II or III) in MAE testing 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 written acceptance and rejection criteria for cylinders has been provided by a Senior Review Technologist. Based on written criteria, the Level II Operator may authorize cylinders that pass the retest to be marked in accordance with paragraph 7.c. of this special permit. However, a person with Level I

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certification may perform a system startup, check calibration, and perform MAE 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 examinations conducted under this special permit.

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

(A) A Level III certificate from ASNT in Acoustic Emission, with a documented minimum of 2 years of experience in Non-Destructive Evaluation (NDE) of pressure vessels or pipelines using the Modal Acoustic Emission test method;

(B) A Professional Engineer (PE) License with a documented minimum of 2 years of experience in Non-Destructive Evaluation (NDE) of pressure vessels or pipelines using the Modal Acoustic Emission test method; or,

(C) A PhD degree in Engineering/Physics with documented evidence of experience in Non-Destructive Evaluation (NDE) of pressure vessels or pipelines, using the Modal Acoustic Emission test method or research/thesis work and authoring/co-authoring of technical papers published, in recognized technical journals, in the field of Modal Acoustic Emission testing methods.

(D) The SRT must prepare and submit the reports required in paragraph 7.d. and annually verify that the MAE program is being operated in accordance with the requirements of this special permit.

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The most recent copies of certification (e.g. ASNT Level III or PE license) must be available for inspection at each requalification facility.

f. **OPERATIONAL CONTROLS:**

(1) The cylinders that are requalified for service life extension under this special permit are limited to US Navy-owned DOT-CFFC specification cylinders, used exclusively for inflating Navy inflatable crafts and maintained under the Navy's standard operating procedures as described in the Digital Wave application (DWC) submitted to OHMSAPD;

(2) Each cylinder that is requalified for service life extension under this special permit must be identified by special permit (DOT-SP 10915, DOT-SP 10945, DOT-SP 11194 or DOT-SP 16343), serial number, DOT standard (DOT-CFFC), cylinder owner (Navy) and MAE requalification results (pass/fail);

(3) The original special permit marking (DOT-SP 10915, DOT-SP 10945, or DOT-SP 11194) of each cylinder that is requalified for service life extension under this special permit must be covered and replaced with DOT-SP 16343 as described in paragraph 7.c. of this special permit;

(4) Record Keeping - Prior to marking a cylinder with "DOT-SP 16343" (designation for extended service life), the identification of each cylinder as described in paragraph 7.f.(ii) of this special permit must be recorded and kept of file. The record must be made available upon request;

(5) Revalidation Plan- All cylinders marked "DOT-SP 16343" are subject to the in-service life extension (Revalidation Plan). The Revalidation Plan is described in paragraph 8.a. of this special permit;

(6) Prior to filling, each cylinder marked "DOT-SP 16343" must be inspected visually for external damage (e.g. acid attack, fiber cut, surface impact, etc.). A cylinder with external damage must be further evaluated in accordance with CGA Pamphlet C-6.2. Cylinders that do not meet acceptance criteria of CGA C-6.2 must be condemned; and

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(7) Maximum Service Life - Cylinders requalified under this special permit are authorized for an additional 5 year service life extension. The maximum service life of any cylinder that was qualified under this special permit is 30 years from the date of original manufacture.

8. **SPECIAL PROVISIONS:**

a. **Revalidation Plan** - DWC must formulate a plan for all the US Navy-owned cylinders that are marked "DOT-SP 16343" for the additional service life extension. The plan must be submitted to OHMSAPD within 12 months of the issuance of this special permit the report should be submitted to specialpermits@dot.gov and must include:

(1) A detailed procedure for obtaining the Navy-owned cylinders from the field and design qualification testing of each design type;

(2) A procedure for the random selection of a minimum of 5 cylinders of each design type (FRP-1, CFFC) which have been in service for 18, 21, 24 and 27 years;

(3) All randomly selected cylinders from the field must be tested in accordance with Sections 8.5.4, 8.5.5, 8.5.7 and 8.5.8 of ISO 11119-2:2002. Acceptance criteria must be as defined in ISO 11119-2:2002. For cylinders manufactured using glass fiber, residual stress measurements must be performed on a single cylinder to demonstrate whether the stress performance is below that required to initiate stress rupture;

(4) The complete MAE test report, including the original test data, must be submitted to the Associate Administrator for Hazardous Materials Safety for assessment within 30 days of completion of the test.

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Failure to meet the acceptance criteria specified in this special permit may result in the design being restricted to a maximum life of 15 years.

b. The designated Senior Review Technologist (SRT) must, within twelve months from the date the special permit is issued and annually thereafter, review the MAE program. The designated SRT must submit a letter to OHMSAPD verifying that the MAE program is meeting the terms and requirements of this special permit. The letter may be submitted with the report required below. If submitted electronically, the letter should be submitted to specialpermits@dot.gov.

c. The total number of cylinders tested under this special permit must be reported by special permit number, specification type (DOT-CFFC), serial number 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 (electronic or paper) to the Associate Administrator for Hazardous Materials Safety annually to assess the effectiveness of the test program. If submitted electronically, the report should be submitted to specialpermits@dot.gov. The summary must include the total number of cylinders tested under this special permit grouped by type or special permit number, size and age. The summary must include the number of cylinders accepted, rejected, or condemned. For any rejected or condemned cylinder, the defect causing the rejection/condemnation must be fully characterized and profiled (i.e., cuts, abrasions, impacts, fiber failures, chemical damage, heat damage, etc.) and the specific size of the defect should be determined (i.e., length, depth, width, etc.). The cylinders that were condemned at visual inspection (prior to MAE) must also be included in the report.

d. A statement of qualifications and supporting documentation, for each "qualified MAE tester" used under this special permit and information in support thereof, must be maintained by Digital Wave Corporation. The statement for each "qualified MAE tester", must be made available upon request.

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

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- f. A current copy of the DOT special permit for the cylinders listed in paragraph 7.a. of this special permit must be maintained at each facility where retesting is performed.
- g. A person who is not a holder of this special permit who receives a packaging covered by this special permit may reoffer it for transportation provided no modification or change is made to the packaging and it is reoffered for transportation in conformance with this special permit and the HMR.
- h. All cylinders that are tested, marked, maintained, or used under this special permit, cease to be considered DOT-SP 10915, DOT-SP 10945, or DOT-SP 11194 cylinders and Hexagon Digital Wave LLC assumes all responsibilities and liabilities as the "manufacturer" of these cylinders, as that term is defined and used in the Federal hazardous materials transportation law (49 U.S.C. §§ 5101-5128) and any and all regulations promulgated by PHMSA (49 CFR Parts 105-180).
- i. Hexagon Digital Wave LLC must hold a valid RIN approval that indicates authorization to conduct testing under the terms of this special permit.
9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel, passenger vessel, and cargo aircraft only.
10. MODAL REQUIREMENTS: A current copy of this special permit must be carried aboard each cargo vessel, aircraft, or motor vehicle used to transport packages covered by this special permit. The shipper must furnish a copy of this special permit 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 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

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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.

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

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for Hazardous Materials Safety, in writing, of any incident involving a package, shipment or operation conducted under terms of this special permit; notification should be provided to specialpermits@dot.gov.

Issued in Washington, D.C.:



for William Schoonover
Associate Administrator for Hazardous Materials Safety

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Material Safety Administration, U.S. Department of Transportation, East Building PHH-30, 1200 New Jersey Avenue, Southeast, Washington, D.C. 20590.

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.

PO: Andrew Eckenrode