

November 15, 2017



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 7277
(TWENTY-SEVENTH REVISION)

EXPIRATION DATE: 2020-12-31

(FOR RENEWAL, SEE 49 CFR 107.109)

1. GRANTEE: National Aeronautics and Space Administration
(NASA)
Washington, D.C.
2. PURPOSE AND LIMITATIONS:
 - a. This special permit authorizes the use of a non-DOT specification fiber reinforced plastic (FRP) full wrapped composite (FC) cylinder conforming with DOT FRP-1 Standard, except as specified herein, for the transportation in commerce of certain Division 2.1 and Division 2.2 compressed gases authorized by 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 development of this special permit only considered the hazards and risks 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, 173.302a(a)(1), 173.304a(a)(1), and (d) in that non-DOT specification cylinders are not authorized, except as specified herein.

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5. BASIS: This special permit is based on the application of Structural Composites Industries LLC dated January 9, 2017, submitted in accordance with § 107.109, and additional information dated May 10, 2017 and September 28, 2017.
6. HAZARDOUS MATERIALS (49 CFR 172.101):

Hazardous Materials Description			
Proper Shipping Name	Hazard Class/ Division	Identification Number	Packing Group
Air, compressed	2.2	UN1002	N/A
Argon, compressed	2.2	UN1006	N/A
Carbon dioxide	2.2	UN1013	N/A
Compressed gas, n.o.s.*	2.2	UN1956	N/A
Helium, compressed	2.2	UN1046	N/A
Hydrogen, compressed	2.1	UN1049	N/A
Methane, compressed <i>or</i> Natural gas, compressed (<i>with high methane content</i>)	2.1	UN1971	N/A
Nitrogen, compressed	2.2	UN1066	N/A
Nitrous oxide	2.2	UN1070	N/A
Oxygen, compressed	2.2	UN1072	N/A

*Only gas mixtures identified as 44-0063-2085 and on file with the Office of Hazardous Materials Safety Approvals and Permits Division (OHMSAPD) are authorized under this entry.

7. SAFETY CONTROL MEASURES:

- a. PACKAGING - Packaging prescribed is a non-DOT specification fiber reinforced plastic (FRP) full composite (FC) cylinder made in accordance with SCI's

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specification SCI Special Report 7338 on file with OHMSAPD, and conforming with DOT FRP-1 Standard, Revision 2 dated February 15, 1982 (178.AA), except as follows:

§ 178.AA-4 Duties of Inspector.

* * *

(b) (Add) In lieu of testing for filament material properties by the special permit holder, a certificate by the filament manufacturer is acceptable provided that the procurement document specifies strength and quality requirements and that the supplied material is certified to those requirements.

§ 178.AA-5 Material.

(a) Aluminum liner must be 6351 or 6061 alloy, T6 temper or 6010 alloy subjected to a solution heat treat and aging appropriate for the alloy as indicated in the application. Aluminum alloy 6351 is not authorized for new construction.

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§ 178.AA-9 Thermal treatment.

(a) The aluminum liner must be solution heat treated and aged as follows after all forming operations and prior to pressurizing or overwrapping.

(1) 6351 and 6061 alloy liners must be solution heat treated and aged to the T6 temper.

(2) 6010 alloy liners must be solution heat treated and aged as appropriate for the alloy indicated in the application.

§ 178.AA-12 Destructive tests.

* * *

(b) Applies except that the rate of cycling may not exceed 10 cycles per minute.

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§ 178.AA-18 Design qualification tests.

* * *

(d) Applies except that the rate of cycling may not exceed 10 cycles per minute.

* * * * *

b. MARKING - Each cylinder must be marked as prescribed in § 178.AA-15 except as follows:

§ 178.AA-15(b) Required markings are as follows:

* * *

Add (6) Rejection elastic expansion (REE) marking in cubic centimeters. The REE for each design type cylinder is obtained as follows:

(i) Perform hydrostatic testing on a lot of cylinders and record elastic expansion (EE) of each cylinder.

(ii) Find the mean value of the EE for all cylinders tested in item 1.

(iii) Mark each cylinder with REE which is equal to 10% above the mean value obtained in item 2. The REE marking must follow the date of test.

(c) thru (d) * * *

c. REQUALIFICATION -

(1) Each cylinder must be reinspected and hydrostatically retested every three years in accordance with §§ 180.205 and 180.209 as prescribed for DOT 3HT cylinders. The hydrostatic test must be conducted in accordance with the procedures specified in § 180.205(g) except that the test pressure must be maintained for a minimum of 60 seconds and as much longer as may be necessary to ensure stable volumetric expansion. The elastic and total volumetric expansions must be determined. Reheat treatment or repair of rejected cylinders is not authorized.

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(2) Retest dates must be stamped on the exposed metallic surface of the cylinder neck or marked on a label securely affixed to the cylinder and overcoated with epoxy near the original test date. Metal stamping of the composite surface is prohibited.

(3) When a hydrostatic retest is repeated as authorized by § 180.205(g) (5) only two such retests are permitted.

(4) A cylinder not marked with an REE must be condemned if the permanent volumetric expansion exceeds 5 percent of the total volumetric expansion at test pressure.

(5) A cylinder marked with an REE must be condemned if the elastic expansion exceeds the marked rejection elastic expansion.

(6) Each time a cylinder is retested, it must be visually inspected internally and externally in accordance with the terms of CGA Pamphlet C-6.1 and C-6.2. The cylinder must be approved, rejected, or condemned according to the criteria set forth in the applicable CGA pamphlet.

(7) Persons who perform inspection and testing of cylinders subject to this special permit must comply with § 180.205(b) and with all the terms and conditions of this special permit. The marking of the retester's symbol on the cylinders certifies compliance with all of the terms and conditions of this special permit.

d. OPERATIONAL CONTROLS -

(1) Cylinders may not be used for underwater breathing purposes.

(2) Cylinders used in oxygen service must conform with § 173.302(b).

(3) A cylinder that has been subjected to fire may not be returned to service.

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(4) Transportation of flammable gases is not authorized aboard aircraft or cargo vessel.

(5) Cylinders must be packaged in accordance with § 173.301(a)(9).

(6) Cylinder service life may not exceed 15 years from the date of manufacture as marked on the cylinder.

(7) Filling requirements are subject to all terms contained in § 173.302a for 3AL specification cylinders.

8. SPECIAL PROVISIONS:

a. A person who is not a holder of this special permit, but receives a package covered by this special permit, 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 special permit and the HMR.

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

c. Each packaging manufactured under the authority of this special permit 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 for a specific manufacturing facility.

f. Transportation of oxygen by aircraft is only authorized when in accordance with § 175.501.

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- g. When transported by cargo vessel, flammable gases authorized by this special permit must be packed within a closed freight container of steel construction.
- h. The cylinders described in this special permit are authorized only for normal transportation as an article of commerce i.e., the movement of hazardous materials packages from consignor to consignee.
9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel, passenger vessel, cargo aircraft only, and passenger-carrying aircraft (see paragraph 8.f. for restrictions).
10. MODAL REQUIREMENTS: A current copy of this special permit must be carried aboard each cargo vessel or aircraft used to transport packages covered by this special permit. The shipper must furnish a current 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 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.

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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 William Schoonover
Associate Administrator for Hazardous Materials Safety

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Materials 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: TG