



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

July 07, 2022

1200 New Jersey Avenue, SE
Washington, DC 20590

DOT-SP 20602
(SEVENTH REVISION)

EXPIRATION DATE: 2026-06-30

(FOR RENEWAL, SEE 49 CFR 107.109)

1. GRANTEE: The Boeing Company
Chicago, IL
2. PURPOSE AND LIMITATION:
 - a. This special permit authorizes the transportation in commerce of spacecraft containing certain hazardous materials, including Class 1 articles, in non-DOT specification packagings. 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 173.185(a) in that batteries need not be of a type testing in accordance with 38.3 of the UN Manual of Tests and Criteria; §§ 173.62, 173.185(b), 173.201, 173.203, 173.302(a), and 173.304(a) in that a non-DOT specification packaging is authorized as specified herein; § 177.848(d) in that segregation is not required for the materials specified herein and contained within the equipment; and § 173.56(b) in that the energetics as configured within the spacecraft have not been examined and approved.
5. BASIS: This special permit is based on the application of The Boeing Company dated June 3, 2022 and submitted in accordance with § 107.109.

Tracking Number: 2022064251

6. HAZARDOUS MATERIALS (49 CFR 172.101):

Hazardous Materials Description			
Proper Shipping Name	Hazard Class/ Division	Identification Number	Packing Group
Alcohols, n.o.s. (Pentanol, Hexanol)	3	UN1987	III
Ammonia, anhydrous	2.2	UN1005	N/A
Ammonia, anhydrous	2.3	UN1005	N/A
Articles, explosive, n.o.s.*	1.4D	UN0352	N/A
Cartridges, power device*	1.4C	UN0276	N/A
Cartridges, power device*	1.3C	UN0275	N/A
Cartridges, power device*	1.4S	UN0323	N/A
Compressed gas, n.o.s	2.2	UN1956	N/A
Dinitrogen tetroxide	2.3	UN1067	N/A
Fuzes, detonating*	1.4S	UN0367	N/A
Helium, compressed	2.2	UN1046	N/A
Hydrazine, anhydrous	8	UN2029	I
Lithium ion batteries, contained in equipment**	9	UN3481	N/A
Methylhydrazine	6.1	UN1244	I
Nitrogen, compressed	2.2	UN1066	N/A
Oxygen, compressed	2.2	UN1072	N/A

*Only Class 1 materials listed in the application may be contained in the CST-100 Spacecraft.

**Contains low production batteries (“Low production” is defined as a production run of no more than 100 cells or batteries annually of a particular type.)

7. SAFETY CONTROL MEASURES:

a. PACKAGING: Prescribed packaging for the CST-100 spacecraft is as follows:

- (1) The spacecraft incorporates non-DOT specification cylinders designed and built to AIAA-S-081A standards (containing Nitrox, Oxygen, & Nitrogen) and built to AIAA-S080-1998 standards (containing the propellant Hydrazine), as well as heat pipes holding ammonia, designed in accordance with DOT-SP 11536. All components are part of a CST-100 spacecraft vehicle capable of ferrying crew and cargo to and from the International Space Station. Design of the CST-100 spacecraft vehicle internal packagings must be as described in the application on file with the Office of Hazardous Materials Safety (OHMS).
- (2) All explosives must be installed in the spacecraft.
- (3) Quantities of materials may not exceed that specified in the applications on file.
- (4) All spacecraft batteries must be lithium ion batteries described as shown in the original application and secured in the spacecraft.
- (5) Not more than 12 CM batteries (composed of 432 Panasonic NCR18650A cells) with a maximum net weight of 86 lbs and an energy rating of 3.6 kWh may be installed in the spacecraft (CST-100). Not more than 3 SM batteries (composed of 24 Sony 18650HCM cells) with a maximum net weight of 4.4 lbs and an energy rating of 150 Wh may be installed in the spacecraft (CST-100). Each battery is encased in an aluminum housing designed to protect the battery.
- (6) Not more than 55 “Ice Brick Belts” each consisting of two plastic “Ice Brick Capsules” (plastic containers made of high-density polyethylene) may be in the spacecraft. Each “Ice Brick Capsule” contains not more than 250 ml of alcohols, n.o.s. (Pentanol, Hexanol) at ambient temperature. Each Ice Brick Capsule must be vacuum sealed in a Hanita Film bag.
- (7) Outer Packaging: Each CST-100 spacecraft shall be packaged in a non-specification robust aluminum outer packaging (TD-CC1-100000-HFPR1) specially designed to protect and secure the article during transport. The outer packaging container is connected to an environmental control system with a diesel generator as well as sensors to monitor temperature, humidity, and vibrations. The container is secured to the vehicle via chain or web strap tie downs. The hazardous components onboard the CST-100 shall remain installed on the vehicle in the locations they occupy during space flight.

- b. LITHIUM ION BATTERY TESTING: All cells must be of a type proven to meet the requirements in JSC 20793 or Boeing Standard DCC1-00486-01 as described in the application on file with OHMS.
 - c. MARKING: The aluminum outer packaging containing the CST-100 spacecraft must be marked on two sides in letters at least 2 inches high on a contrasting background “DOT-SP 20602”.
 - d. OPERATIONAL CONTROLS: Transportation of the CST-100 spacecraft must be performed by a third-party commercial carrier capable of transporting hazardous materials in accordance with the HMR and this special permit.
8. SPECIAL PROVISIONS:
- a. A person who is not a holder of this special permit who receives a package covered by this special permit may reoffer it for transportation provided no modification or change is made to the package and it is reoffered 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.
9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle.
10. MODAL REQUIREMENTS: A current copy of this special permit must be carried aboard each motor vehicle used to transport packages covered by this special permit.
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.

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 Material Safety Administration, U.S. Department of Transportation, East Building PHH-13, 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 <https://www.phmsa.dot.gov/approvals-and-permits/hazmat/special-permits-search>. Photo reproductions and legible reductions of this special permit are permitted. Any alteration of this special permit is prohibited.

PO: ae