



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

March 28, 2023

1200 New Jersey Avenue, SE
Washington, DC 20590

DOT-SP 21537

EXPIRATION DATE: 2023-08-31

(FOR RENEWAL, SEE 49 CFR 107.109)

1. GRANTEE: Astro Digital US Inc.
Santa Clara, CA
2. PURPOSE AND LIMITATIONS:
 - a. This emergency special permit authorizes the transportation in commerce of prototype and low production lithium ion batteries contained in equipment (spacecraft). This special permit provides no relief from the Hazardous Materials Regulations (HMR), the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO TI), or the International Maritime Dangerous Goods (IMDG) Code 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.
 - d. This special permit serves as an "exemption" as defined in 1;3.1.1 of the ICAO TI, as an "exemption" under Chapter 7.9, Section 7.9.1 of the IMDG Code (see IMO MSC/Circ. 1075-Granting Exemptions from the Provisions of the IMDG Code), and as a "Competent Authority Approval" as defined under 49 CFR § 107.1.
3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180 and the IMDG Code.
4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR § 173.185(a)(1), 2;9.3 a) of the ICAO TI, and 2.9.4.1 of the IMDG Code in that the lithium batteries have not passed the criteria in Part III, subsection 38.3 of the UN Manual of Tests and Criteria.

Tracking Number: 2023034924

5. BASIS: This emergency special permit is based on the application of Astro Digital US Inc. dated March 15, 2023, submitted in accordance with § 107.117 and the determination it is necessary to prevent significant economic loss and supplemental information submitted on March 17, 2023.
6. HAZARDOUS MATERIALS (49 CFR 172.101):

Hazardous Material Description			
Proper Shipping Name	Hazard Class/ Division	Identification Number	Packing Group
Lithium ion batteries contained in equipment <i>including lithium ion polymer batteries</i>	9	UN3481	N/A

7. SAFETY CONTROL MEASURES:

a. OPERATIONAL CONTROLS:

- (1) This special permit is valid only for the transportation in commerce of prototype and low production lithium ion batteries contained in equipment (Cornicen spacecraft) may be offered for transportation under the terms of this special permit. ("Low production" is defined as a production run of no more than 100 cells or batteries annually of a particular type.).
- (2) A total of two battery pack assemblies (BPAs) are affixed to a spacecraft in a 7S2P configuration with an aggregate energy content of 250 Wh and consists of Samsung INR21700-50E component cells.
- (3) The BPAs contained in equipment must be equipped with a battery management system that has been verified to prevent overcharge, external short circuiting, and over-discharge.
- (4) BPAs must be equipped with a means of preventing dangerous reverse current flow for BPAs connected in parallel.
- (5) Not more than one spacecraft is permitted within a package.
- (6) The spacecraft must be constructed to prevent against accidental operation during transport.

b. TESTING REQUIREMENTS:

(1) Each cell in the BPAs must be a type that has passed the required tests in accordance with the UN Manual of Tests and Criteria, 6th Revised Edition.

(2) The BPAs contained in equipment must have been designed to operate in the extreme environment of outer space and must be of a type that has passed safety tests to qualify for the expected mission environments to be equivalent to the UN's 38.3 7th Revised Edition T.1 (Altitude), T.2 (Thermal), T.3 (Vibration-planned), and T.4 (Shock-planned) as described in the March 15, 2023, application on file with the Office of Hazardous Materials Safety.

c. PACKAGING:

(1) Each BPA must have a strong, impact-resistant outer casing.

(2) The BPAs must be securely mounted to the spacecraft structural panel. The spacecraft must be mounted on shock isolators.

(3) The spacecraft must be placed in a strong fire-retardant composite enclosure, which is mounted on wheels for ease of handling.

(4) The BPAs contained in equipment must be protected from short-circuiting while in transportation.

(5) The spacecraft within the package must be securely fastened in the spacecraft holder.

d. MARKING REQUIREMENTS: The package, and overpack if used, prepared under the provisions of this special permit must be plainly marked with the permit number "DOT-SP 21537".

8. SPECIAL PROVISIONS:

a. Under the terms of this special permit, the grantee may only offer hazardous materials (i.e., the grantee is not authorized as a carrier).

b. 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 modification or change is made to the package and it is offered for transportation in conformance with this special permit, the HMR, the ICAO TI, and the IMDG Code.

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

d. This special permit in no way affects the need to obtain any required authorizations from other agencies of the United States Government or from the competent authorities of the States of origin, transit, over flight, and destination of the consignment, as well as the State of the air operator.

e. The special permit holder must maintain a record of all activity conducted under the authority granted in this special permit. The record must contain a complete listing and number of shipments made to include and upon request make this information available to a DOT representative or an enforcement official. The record must contain a listing and number of shipments made to include:

- (1) Dates of shipment; and
- (2) Description of each type of shipment.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel, and cargo-only aircraft.
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 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 Materials 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: Steve H