



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

March 07, 2025

1200 New Jersey Avenue, SE
Washington, DC 20590

DOT-SP 21359
(SECOND REVISION)

EXPIRATION DATE: 2029-01-31

(FOR RENEWAL, SEE 49 CFR 107.109)

1. GRANTEE: Thales Alenia Space
Cannes, France

US AGENT: ShipMate, Inc.
Sisters, OR

2. PURPOSE AND LIMITATION:

a. This special permit authorizes the transportation in commerce of the satellite transport container (STC) that contains the satellite and certain non-DOT specification containers (satellite assemblies) including low production lithium ion batteries contained in equipment that have not passed the criteria in the UN Manual of Tests and Criteria and exceed 35 kg net weight aboard cargo-only aircraft, certain Division 2.2 and 2.3 liquefied and compressed gases, unapproved explosives, and other hazardous materials identified in paragraph 6 of this special permit. This special permit provides no relief from the Hazardous Materials Regulations (HMR) or the International Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO TI) 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 approval under § 172.102(c)(1), Special Provisions 131 and 391, and as a "Competent Authority Approval" as defined under 49 CFR § 107.1.

Tracking Number: 2024085182

3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.
4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR § 172.101 Hazardous Materials Table, Column (9B) in that lithium batteries may not have a mass exceeding 35 kg per package, except as specified herein; § 173.185(a)(1) and 2;9.3 a) of the ICAO TI in that lithium ion batteries must have passed the criteria in Part III, subsection 38.3 of the UN Manual of Tests and Criteria, except as specified herein; §§ 172.300 and 172.400 in that marking and labeling of the packaging (pressure vessel) contained within the spacecraft is required, except as specified herein; §173.301(f) in that the pressure vessel within the equipment must be fitted with a pressure relief device, except as specified herein; § 173.302a(a)(1) in that non-DOT specification packaging (vessel) is not authorized, except as specified herein; § 173.56 in that articles containing explosives must be examined, classified, and approved, except as specified herein; § 173.304a(a)(2) and Packing Instruction 200 of the ICAO TI in that non-DOT specification packaging is not authorized, except as specified herein; § 172.101 Hazardous Materials Table, Column (9B) and Columns 12 and 13 in Table 3-1 of the ICAO TI in that anhydrous ammonia and articles containing toxic gas, n.o.s. (ammonia, anhydrous) are forbidden aboard cargo-only aircraft, except as specified herein.
5. BASIS: This special permit is based on the application of Thales Alenia Space dated August 26, 2024, submitted in accordance with § 107.109.
6. HAZARDOUS MATERIALS (49 CFR 172.101):

Hazardous Materials 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
Articles containing toxic gas, n.o.s. (contains Ammonia, anhydrous)**	2.3	UN3539	N/A
Helium, compressed	2.2	UN1046	N/A
Xenon, compressed	2.2	UN2036	N/A
Nitrogen, compressed	2.2	UN1066	N/A
Cartridges, power device	1.4S	UN0323	N/A

*Only low production lithium ion batteries may be offered for transportation. ("Low production" is defined as a production run of not more than 100 batteries annually of a particular type). Each different battery type must comply with all the conditions of this special permit prior to being offered for transportation.

**Division 2.3 for international transportation. Division 2.2 as an alternate only when domestic transportation is involved.

7. **SAFETY CONTROL MEASURES:**

a. **PACKAGING:** The prescribed outer packaging is a satellite transport container (STC) containing:

- (1) The satellite which, contains lithium ion batteries, heat pipes, compressed helium and xenon cylinders, and exempted Division 1.4S devices as described in the application on file with the Office of Hazardous Materials Safety (OHMS)
- (2) Nitrogen cylinders.
- (3) Refrigerating machines, UN2857, Division 2.2 to keep the contents within the STC under an air-conditioned condition. (Excepted per 49 CFR § 173.307(a)(4)(i)).
- (4) Heat pipes. The heat pipes must be packaged as follows:
 - (i) Up to 517 heat pipes, containing between 3.2 and 57.8 grams of anhydrous ammonia (total capacity in all heat pipes does not exceed 14 kg (31 pounds)).
 - (ii) Heat pipes must be constructed of aluminum alloy 6063-T5 and have a minimum wall thickness of 0.75 millimeters; heat pipes must be sealed on one end with a crimp and a soldered plug on the other end. Heat pipes must be in accordance with the application on file with the OHMS.
- (5) Lithium ion battery. The lithium ion batteries contained in equipment must be packaged as follows:
 - (i) Each battery must be contained in the equipment (spacecraft) designed for space application and an air conditioning system and constructed of suitable material of adequate strength and design.

(ii) The equipment containing the battery must be placed in a rigid and fully encased, specially designed outer STC as described in the April 11, 2022, and July 8, 2022, submissions on file with the OHMS.

(iii) The aggregate net weight of each (10S4P) battery, which is comprised of 2 modules, each having ten (10) VL51ES cells, is 55.5 kg (123 pounds). The total combined weight of the two batteries is 222 kg (490 pounds)

(6) Helium tank. The tank is a non-DOT specification packaging used to store auxiliary propellant (hydrazine) and pressurized nitrogen during satellite launch.

(i) The tank is manufactured by Ste Raphael and is constructed of titanium. The tank is proof pressure tested at 38.3 bar and has capacity of 37.6 L. It has a minimum burst pressure of 51 bars.

(ii) During satellite transportation, this tank is filled with Helium at pressure of 2 ± 0.5 bars while the temperature is maintained at 23 ± 5 °C.

(7) Xenon cylinders. Xenon, stored in 6 cylinders, is the main propellant for the satellite. The cylinders are non-DOT specification carbon composite overwrapped vessels (COPV) with titanium liner. The cylinders are manufactured by Orbital ATK. Each cylinder has a capacity of 132.7 L (229.5 kg) and is proof pressure tested to is 233 bars. The minimum burst pressure is 408 bars. The total mass of the xenon in all cylinders is 1,377 kg (3,036 pounds). The pressure in the tank during transport is 2 ± 0.5 bars as the temperature is maintained at 23 ± 5 °C.

(8) Nitrogen cylinders. There are two (2) nitrogen non-DOT specification cylinders that are part of the STC transport container to provide purge gas to keep the inside of the STC clean during transport of the satellite.

(i) The two (2) cylinders must be manufactured in accordance with the Packing Instruction 200 of the ICAO TI with no pressure relief devices.

(ii) The nitrogen cylinders, each containing about 10 kg (22 pounds) of compressed nitrogen, must be directly and securely connected to the inside of the STC to create a clean-room condition.

b. OPERATIONAL CONTROLS:

- (1) Only low production lithium ion batteries contained in equipment as described in the Thales Alenia Space application dated April 11, 2022, and on file with the OHMS 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) The Watt-hour rating of each battery contained in equipment, comprised of 2 modules, each having 10 x VL51ES cells that an average capacity of 51 Ah at 4.1V (or an average energy of 180 Wh at 4.1V). Each module has an average energy of 1.82 kWh per module, and each battery has an average energy of 3.64 kWh.
- (3) There must be not more than two (2) batteries contained in equipment with an aggregate average energy content of not more than 7.28 kWh.
- (4) All batteries contained in equipment must be offered for transportation at a state of charge not exceeding 30 percent.
- (5) The batteries must be equipped with an effective means of preventing dangerous reverse current flow for the batteries that contain cells connected in parallel.
- (6) Cells and batteries must be protected against short circuiting.
- (7) Transportation of the satellite (spacecraft) contained in the STC is authorized for the one-way movement from France to Cape Canaveral, Florida.
- (8) The nitrogen cylinders may discharge nitrogen gas at a volumetric flow rate keeping a very small positive pressure during transportation in the STC and preventing the introduction of contaminants into it.
- (9) Emergency response information provided with the shipment and available via an emergency response telephone number must indicate that certain packagings within the outer transport container are not fitted with pressure relief devices and provide appropriate guidance in case of fire exposure.

c. TESTING REQUIREMENTS:

(1) Each SAFT cell within the battery must be of a type tested in accordance with the UN Manual of Tests and Criteria, 6th Revised Edition.

(2) The battery need not be of a type tested in accordance with the UN Manual of Tests and Criteria.

d. MARKING: The outer transport container (STC) must be plainly and durably marked on two opposite sides in letters at least 2 inches in height on a contrasting background “DOT-SP 21359” as specified in § 172.301(c) and “DO NOT STACK”.

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 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, the HMR, and the ICAO TI.

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, cargo vessel, and cargo-only aircraft.

10. MODAL REQUIREMENTS:

a. 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 or vessel carrier before or at the time the shipment is tendered.

b. When transported via cargo vessel, the STC must be protected from sources of heat, must be kept clear of living quarters, and must be stowed on deck.

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.:

A handwritten signature in blue ink, appearing to read "W. Schoonover", is written over a horizontal line.

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: BB