

- 3) if A109 appears in column 7, the substance may only be transported to, from or within the United States aboard a cargo aircraft with the prior approval of the appropriate authority of the U.S. (see US 1);
- 4) prototype lithium batteries and cells transported in accordance with Special Provision A88, and organic peroxides and self-reactive substances that are not identified by a technical name in 49 CFR 173.225(b) may not be transported to, from, or within the United States aboard a passenger or cargo aircraft without the prior approval of the appropriate authority of the U.S. (see US 1).

≠ US 4 Substances subject to additional requirements for air transport to, from or within the United States are described below. The additional requirements in III also apply to U.S. carriers operating outside the U.S.

- I. *Hazardous substances.* When a substance, including its mixtures and solutions, listed in Appendix A to 49 CFR 172.101 is offered for transport in a package in which the net quantity of the substance equals or exceeds the reportable quantity (RQ) indicated for the substance in Appendix A, the substance, mixture or solution is considered a hazardous substance unless:

- it is a petroleum product that is a lubricant or fuel; or
- it is in a concentration less than that shown in the following table based on the RQ specified for the material:

<i>RQ</i> Kilograms	<i>Concentration by weight</i>	
	<i>Per cent</i>	<i>PPM</i>
45.4	0.2	2 000
4.54	0.02	200
0.45	0.002	20

For mixtures of radionuclides, see Note 7 to Appendix A to 49 CFR 172.101.

Hazardous substances, except for those that are hazardous wastes as defined in Section II below, must comply with the following requirements:

- a) For a hazardous substance that is a dangerous good according to these Technical Instructions other than under the proper shipping names “ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.” or “ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.”:
 - 1) unless already included in the required shipping name, and except for radioactive material in Class 7, the name of the hazardous substance shall be shown in parentheses, in association with the dangerous goods description on the transport document and in association with the proper shipping name on package marking; and
 - 2) the letters “RQ” shall be entered on the transport document either before or after the basic description and in association with the proper shipping name required to be marked on the package.
- b) For hazardous substances that do not meet any other definition of dangerous goods according to these Technical Instructions:
 - 1) the hazardous substance shall be shipped under the basic dangerous goods description “ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., Class 9, UN 3082, III” or “ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., Class 9, UN 3077, III”, as appropriate, and in accordance with the requirements of these Technical Instructions applying to the shipment of goods under this description;
 - 2) the package must meet all applicable General Packing Requirements of Part 4, Chapter 1 of these Instructions that would apply to dangerous goods of Packing Group III;
 - 3) the letters “RQ” shall be entered on the transport document either before or after the basic description and in association with the proper shipping name required to be marked on the package; and
 - 4) the name of the hazardous substance shall be shown in parentheses, in association with the dangerous goods description on the transport document and in association with the proper shipping name on package marking. If the material contains more than two hazardous substances, only the two hazardous substances having the lowest reportable quantities must be identified.

Note.— The list of Hazardous Substances and the applicable RQ as shown in Appendix A to 49 CFR 172.101 is available via the internet at:

<http://hazmat.dot.gov/regs/intl/icaovar.htm>.

II. *Hazardous waste.* A hazardous waste is any material that is subject to the hazardous waste manifest requirements of the United States Environmental Protection Agency (EPA) specified in 40 CFR Part 262. The following requirements apply to the transport of hazardous wastes:

- a) For a hazardous waste that is a dangerous good according to these Technical Instructions other than under the proper shipping names “ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.” or “ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.”:
 - 1) the word “WASTE” must precede the proper shipping name in the transport document and package markings; and
 - 2) the requirements of 49 CFR 172.205, with respect to the hazardous waste manifest apply.
- b) For hazardous wastes that do not meet any other definition of dangerous goods according to these Technical Instructions:
 - 1) the hazardous wastes shall be shipped under the basic dangerous goods description “WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., Class 9, UN 3082, III” or “WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., Class 9, UN 3077, III”, as appropriate, and in accordance with the requirements of these Technical Instructions applying to the shipment of goods under this description;
 - 2) the package must meet all applicable General Packing Requirements of Part 4, Chapter 1 that would apply to dangerous goods of Packing Group III;
 - 3) the requirements of 49 CFR 172.205 with respect to the hazardous waste manifest apply; and
 - 4) for those hazardous wastes that meet the definition of a hazardous substance, the letters “RQ” and the name of the hazardous substance in parentheses shall be shown in association with the basic description on transport documents and package markings.

Note 1.— Hazardous wastes can only be transported within the United States by carriers who have obtained a Waste Transporter Identification Number from the Environmental Protection Agency (EPA).

Note 2.— The assignment of substances described in I and II above to UN 3077 and UN 3082 is in accordance with special provision A97 of these Technical Instructions.

Note 3.— The list of Hazardous Substances and the applicable RQ as shown in Appendix A to 49 CFR 172.101 is available via the internet at:

<http://hazmat.dot.gov/regs/intl/icaovar.htm>.

III. *Other materials.* Materials which are not subject to the requirements of these Technical Instructions but meet the definition of a hazard class in 49 CFR Parts 171-180 must be transported in accordance with those regulations.

≠	US 5	An explosives article or substance may not be transported to, from or within the United States without prior approval by the appropriate authority of the U.S. (see US 1), Attention: Office of Hazardous Materials Special Permits and Approvals (PHH-30)). Such approval remains valid for subsequent transport of the article or substance provided there is no change in its composition, design or packaging. Except as otherwise provided in 49 CFR 172.320, each package containing an explosives article or substance must be marked with the EX-number assigned in the approval for each substance, article or device contained in the package. The EX-number may also be provided in association with the description of dangerous goods on the transport document rather than marked on the package as provided in 49 CFR 172.320(d). Cartridges, small arms of the kind listed in 49 CFR 173.56(h) do not require prior approval or an EX-number.	2;1.3
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≠	US 6	<p>Cylinders transported to, from or within the United States must be manufactured, inspected and tested in accordance with the applicable specifications given in 49 CFR 178, except that foreign cylinders received in the United States for charging may be transported for purposes of export from the United States in accordance with 49 CFR 171.23(a)(4). Portable tanks other than UN portable tanks manufactured outside the United States that meet the applicable requirements of the UN Model Regulations must be designed and approved in accordance with the requirements of 49 CFR 178.270 through 178.272.</p> <p>Except as provided in 49 CFR 173.306, aerosol containers larger than 120 millilitres capacity (four fluid ounces) must be non-refillable metal receptacles. Aerosols must consist of a gas compressed, liquefied or dissolved under pressure, with the sole purpose of expelling a nonpoisonous (other than a Division 6.1 Packing Group III material) liquid, paste or powder and fitted with a self-closing release device allowing contents to be ejected by the gas.</p>	<p>Table 3-1</p> <p>2;2 PI 203, PI 204, PI Y204 (UN 1950)</p>
≠	US 7	<p>Lighters or other similar devices containing flammable gas (e.g. lighters for fireplaces and torches) may not be transported to, from or within the United States, unless the design of the device has been examined and tested by a person authorized by the appropriate authority of the United States (see US 1). For design samples being submitted for examination and testing, see 49 CFR 173.308.</p> <p>Until 1 January 2012, approval numbers issued by the appropriate authority of the United States (see US 1) prior to 1 January 2007 may continue to be marked on packages and annotated on the transport document where applicable. After that time, previously issued approvals (i.e. T-***) will no longer be valid and each lighter design currently in production must be re-examined and tested under the provisions of 49 CFR 173.308.</p>	<p>5;2 5;4</p>
≠	US 10	<p>The following additional requirements or limitations apply to the transport of radioactive material to, from or within the United States:</p> <p>a) Radioactive material, other than that contained in excepted packagings, may not be offered for transport aboard passenger aircraft unless the radioactive material is intended for use in, or incident to, research or medical diagnosis or treatment. The transport document for the radioactive material, other than that contained in excepted packagings aboard a passenger aircraft, must contain a certification stating that the shipment contains radioactive material intended for use in, or incident to, research or medical diagnosis or treatment.</p> <p>b) No person may offer for transport aboard a passenger aircraft a package or an overpack with a transport index greater than 3.0.</p> <p>c) No person may offer or transport plutonium aboard an aircraft unless:</p> <ol style="list-style-type: none"> 1) the plutonium is contained in a medical device designed for individual human application; 2) the specific activity of the material containing the plutonium is less than 1 Bq/g; 3) the plutonium is shipped in a single package containing no more than an A2 quantity of plutonium in any isotope or form and is shipped in accordance with applicable provisions of these Instructions for Class 7 radioactive material; or 4) the plutonium is specifically authorized for air shipment by the appropriate authority of the U.S. <p>d) For a package containing radioactive material with an activity greater than:</p> <ol style="list-style-type: none"> 1) $3000 \times A_1$; 2) $3000 \times A_2$; or 3) 1000 TBq (27000 Ci), whichever is least, <p>the notation "highway route controlled quantity" must appear on the transport document.</p> <p>e) Packages containing:</p> <ol style="list-style-type: none"> 1) $3000 \times A_1$; 2) $3000 \times A_2$; or 3) 1000 TBq (27000 Ci); whichever is least, <p>must bear the Radioactive material, Class 7, Category III — Yellow label.</p>	<p>5;1.2 7;1</p> <p>5;1.2.3.1.4</p>

- f) All Type B(U), Type B(M), Type H(U), Type H(M) and fissile package designs must be certified by the U.S. Department of Transportation. Individual packages with a criticality safety index exceeding 50, and shipments of packages with a total criticality safety index greater than 50 on passenger aircraft and 100 on cargo aircraft, may not be transported to, from or within the United States aboard a passenger or cargo aircraft without the prior approval of the appropriate authority of the United States (see US 1). Requests for package design certification and approvals should be directed to the appropriate authority of the U.S., Attention: Radioactive Materials Branch (PHH-23). 6;7.7
6;7.8
- g) Except for low specific activity material and surface contaminated objects, activity limits for Type A and Type B packages shall be limited in accordance with 49 CFR 173.431.
- US 11 A nonspillable wet electric storage battery may only be regarded as not subject to these Instructions if the battery and its outer packaging are plainly and durably marked "NONSPILLABLE" or "NONSPILLABLE BATTERY" and the battery meets the conditions for being regarded as not subject to these Instructions contained in Special Provision A67. Table 3-2
- ≠ US 12 On shipments to, from, within or transiting through the U.S., emergency response information as described below must be provided for all dangerous goods other than magnetized material, dangerous goods for which no Transport document is required, and Other Regulated Material as defined in 49 CFR 173.144. 5;4.1.4
7;4.4

Telephone number. The transport document required by these Instructions must include an emergency response telephone number (including area codes and for international numbers for locations outside the U.S., the country and city codes needed to complete the call from within the U.S.) for use in the event of an incident involving the dangerous good(s). The number must be monitored at all times while the dangerous good is in transportation, including storage incident to transportation, by a person who:

- 1) is knowledgeable of the hazards and characteristics of the dangerous good(s) being transported;
- 2) has comprehensive emergency response and accident mitigation information for the dangerous good(s); or
- 3) has immediate access to a person who possesses such knowledge and information.

The telephone number must be entered on the Transport document and its purpose clearly identified (e.g. "EMERGENCY CONTACT: ***"), either:

- 1) immediately following the description of the dangerous good listed on the document, or
- 2) if only one number applies to each dangerous good listed on the Transport document, the information may be entered in a single prominent location, provided that the number is identified as the emergency response telephone number.

The telephone number must be the number of the person offering the dangerous goods for transportation or the number of an agency or organization capable of, and accepting responsibility for, providing the detailed information concerning the dangerous good. A person offering a dangerous good for transportation who lists the telephone number of an agency or organization must ensure that agency or organization has received current information on the material before it is offered for transportation.

An emergency response telephone number is not required for materials properly described under the shipping names "Battery-powered equipment", "Battery-powered vehicle", "Carbon dioxide, solid", "Consumer commodity", "Dry ice", "Engines, internal combustion (flammable gas powered)", "Engines, internal combustion (flammable liquid powered)", "Vehicle (flammable gas powered)", "Vehicle (flammable liquid powered)", "Castor beans, flakes, meal or pomace", "Refrigerating machines" and materials transported under the limited quantity provisions.

Emergency response information. Emergency response information relative to the dangerous good being transported must be immediately available at all times the dangerous good is present. This information should be appropriate for use in emergency and accident response to an incident, including an incident occurring during ground operations. The information must include as a minimum:

- 1) the description of the dangerous good in accordance with 5;4. of these Instructions;
- 2) immediate hazards to health;
- 3) risks of fire or explosion;
- 4) immediate precautions to be taken in the event of an accident or incident;
- 5) immediate methods for handling fires;
- 6) initial methods for handling spills or leaks in the absence of a fire; and

- 7) preliminary first aid measures.

The information must be printed in English, available away from the package containing the dangerous goods and immediately accessible in the event of an incident. Methods of compliance include, but are not limited to:

- 1) including the information on the Transport document;
- 2) locating the information in a separate document such as a material safety data sheet which includes at least all of the information listed above; or
- 3) providing the information for use in conjunction with the Transport document (or aboard aircraft, in conjunction with the Information to Pilot-in-Command as required in 7.4.1 of these Instructions), in a separate document, such as the ICAO *Emergency Response Guidance for Aircraft Incidents involving Dangerous Goods* (Doc 9481).

- ≠ US 13 Operators must comply with all requirements of 49 CFR, Part 175 (see US 1). These requirements include, but are not limited to, the following:
- a) A package prepared in accordance with these Technical Instructions for transport to, from or within the United States must not be accepted unless the shipper has complied with all applicable United States variations indicated in these Technical Instructions. 7;1
 - b) A copy of the transport document, or an electronic image thereof, must be retained by the initial operator for not less than one year after the dangerous goods are accepted by the initial operator. Each shipping paper copy must include the date of acceptance by the initial operator. The date on the shipping paper may be the date a shipper notifies the air carrier that a shipment is ready for transportation, as indicated on the airway bill or bill of lading, as an alternative to the date the shipment is picked up or accepted by the carrier. For a hazardous waste, the transport document copy must be retained for three years after the waste material is accepted by the initial operator. 7;1
 - c) The notification to pilot-in-command must list, and provide the required information for, those additional materials considered to be dangerous goods under United States' regulations as indicated through United States variations. 7;4.1.1
 - d) Except for "Other Regulated Materials" as defined in 49 CFR 173.144, substances of Class 9, radioactive material, aircraft batteries transported as items of replacement, and those articles and substances considered to be dangerous goods under these Technical Instructions but which are not subject to 49 CFR Parts 170-180, the following limitations apply:

No more than 25 kg net weight of dangerous goods, and in addition thereto, 75 kg net weight of non-flammable gas, that are permitted to be carried aboard a passenger aircraft may be carried aboard an aircraft:

 - 1) in an inaccessible cargo compartment;
 - 2) in any freight container within an accessible cargo compartment; or
 - 3) in any accessible cargo compartment of a cargo aircraft if the dangerous goods are loaded so as to be inaccessible unless in a freight container.

For transport by cargo aircraft, the following additional substances are also excepted from this variation:

 - 1) Division 6.1 (poisonous) materials (except those labelled FLAMMABLE);
 - 2) Materials in Division 6.2 (etiologic or infectious substances);
 - 3) Class 3 (flammable liquid) materials with a flashpoint above 23EC (73EF) that do not meet the definition of another hazard class.

The following tables provide the limits imposed by this variation:

PASSENGER AIRCRAFT**Packages authorized for transport aboard a passenger aircraft**

In an accessible cargo compartment		
If packages are accessible	If packages are inaccessible	If packages are in a freight container
No limit	25 kg per compartment plus an additional 75 kg of Division 2.2 material	25 kg per container plus an additional 75 kg of Division 2.2 material
In an inaccessible cargo compartment		
If packages are not in a freight container		If packages are in freight container
25 kg per compartment plus an additional 75 kg of Division 2.2 material		25 kg per compartment plus an additional 75 kg of Division 2.2 material

CARGO ONLY AIRCRAFT**Packages authorized for transport aboard a passenger aircraft**

In an accessible cargo compartment		
If packages are accessible	If packages are inaccessible	If packages are in a freight container
No limit	25 kg per compartment plus an additional 75 kg of Division 2.2 material	25 kg per container plus an additional 75 kg of Division 2.2 material
In an inaccessible cargo compartment		
If packages are not in a freight container		If packages are in freight container
25 kg per compartment plus an additional 75 kg of Division 2.2 material		25 kg per compartment plus an additional 75 kg of Division 2.2 material

Packages only authorized for transport aboard a cargo aircraft

In an accessible cargo compartment			
If packages are accessible	If packages are inaccessible	If packages are in a freight container and are accessible	If packages are in a freight container and are inaccessible
No limit	Forbidden. Except the following materials are not subject to this restriction: a. Class 3, PG III (unless the hazardous material meets the definition of another hazard class) b. Class 6, (unless also labelled as a flammable liquid) c. Class 7, (unless the hazardous material meets the definition of another hazard class)	No Limit	Forbidden. Except the following materials are not subject to this restriction: a. Class 3, PG III (unless the hazardous material meets the definition of another hazard class) b. Class 6, (unless also labelled as a flammable liquid) c. Class 7, (unless the hazardous material meets the definition of another hazard class)
In an inaccessible cargo compartment			
If packages are not in a freight container		If packages are in a freight container	
Forbidden. Except the following materials are not subject to this restriction: a. Class 3, PG III (unless the hazardous material meets the definition of another hazard class) b. Class 6, (unless also labelled as a flammable liquid) c. Class 7, (unless the hazardous material meets the definition of another hazard class)		Forbidden. Except the following materials are not subject to this restriction: a. Class 3, PG III (unless the hazardous material meets the definition of another hazard class) b. Class 6, (unless also labelled as a flammable liquid) c. Class 7, (unless the hazardous material meets the definition of another hazard class)	

- e) Operators must comply with the incident reporting requirements of 49 CFR 171.15, 171.16 and discrepancy reporting under 175.31. 7;4.4

Note.— Copies of the incident reporting form and guidance for completing it may be downloaded at <http://hazmat.dot.gov/enforce/spills/spills.htm>.

- ≠ US 15 Except as provided for cylinders of compressed oxygen, no person may load or transport to, from or within the United States a package containing a dangerous good requiring an OXIDIZER label in an inaccessible cargo compartment that is not equipped with a fire or smoke detection system and a fire suppression system. Table 3-1
PI 200
7;2
7;4.1

Cylinders of compressed oxygen must be transported in accordance with the following:

- a) No more than a combined total of six cylinders of compressed oxygen per aircraft may be stowed in cargo compartments not equipped with a fire or smoke detection system and a fire suppression system;
- b) Except for oxygen cylinders allowed to be transported in the passenger compartment under the conditions given below, oxygen cylinders transported on passenger aircraft or in an inaccessible cargo location on a cargo aircraft must be stowed horizontally as close as practicable to the floor of the cargo compartment or unit load device;

- c) When transported in a Category B compartment or its equivalent (i.e. an accessible compartment equipped with a fire detection system), cylinders of compressed oxygen must be loaded in a manner that a crew member can see, handle and, when size and weight permit, separate the cylinders from other cargo during flight. No more than six cylinders of compressed oxygen and, in addition, one cylinder of medical-use compressed oxygen per passenger needing oxygen at destination — with a rated capacity of 1 000 L (34 cubic feet) or less of oxygen — may be carried in a Class B aircraft cargo compartment or its equivalent; and
- d) Each cylinder must conform to the requirements identified in US Variation 6 and when loaded into a passenger-carrying aircraft or in an inaccessible cargo location of a cargo-only aircraft, must be placed in an overpack or outer packaging that conforms to the performance criteria of Air Transport Association (ATA) Specification 300 for Category I shipping containers.

A cylinder containing medical-use compressed oxygen, owned or leased by an aircraft operator or offered for transportation by a passenger needing it for personal medical use at destination, may be carried in the cabin of a passenger aircraft in accordance with the following provisions: 8;1.1.2

- a) No more than six cylinders belonging to the aircraft operator and, in addition, no more than one cylinder per passenger needing the oxygen at destination, may be transported in the cabin of the aircraft;
- b) The rated capacity of each cylinder may not exceed 1 000 L (34 cubic feet);
- c) Each cylinder must conform to the requirements identified in US Variation 6 and must be placed in an overpack or outer packaging that conforms to the performance criteria of Air Transport Association (ATA) Specification 300 for Category I or placed in a metal, plastic or wood outer packaging that conforms to a UN standard at the Packing Group I or II performance level; and
- d) Oxygen cylinders transported under these provisions must be included in the information provided to the pilot-in-command in accordance with 7;4.1 of these Instructions.

≠ US 16 Air bag inflators, air bag modules and seat-belt pretensioners may not be transported to, from or within the United States without prior approval by the appropriate authority of the United States (see US 1), Attention: Office of Hazardous Materials Special Permits and Approvals (PHH-30). Such approval remains valid for subsequent transport provided there is no change in its composition, design or packaging. Air bag inflators, modules and pretensioners that meet the criteria for a Division 1.4G explosive must be transported using the description “Articles, pyrotechnic for technical purposes”, UN 0431. The dangerous goods transport document (shipping papers) must contain the EX number or product code for each approved inflator, module or pretensioner in association with the basic description required in 5;4.1.4. If product codes are used, they must be traceable to the specific EX number assigned to the inflator, module or pretensioner, as applicable, by the appropriate authority of the United States. The EX number or product code is not required to be marked on the outer package.

US 17 Shippers and operators must comply with the security requirements as prescribed in Part 172, Subpart I, as applicable. 1;5

+ US 18 A package containing Oxygen, compressed, UN 1072, or any of the following oxidizing gases must be packaged as required by Parts 173 and 178 of 49 CFR: Compressed gas, oxidizing, n.o.s., UN 3156; Liquefied gas, oxidizing, n.o.s., UN 3157; Nitrogen trifluoride, UN 2451; and Nitrous oxide, UN 1070.

An oxygen generator, chemical (as defined in 49 CFR 171.8) may only be transported on cargo aircraft as provided for in 49 CFR 173.168. An oxygen generator, chemical, UN 3356, is not permitted for transport on passenger aircraft unless approved by the appropriate authority of the United States (see US 1). An oxygen generator, chemical, UN 3356, that is transported with a means of initiation attached must be classed and approved by the appropriate authority of the United States (see US 1) in accordance with the procedures specified in 49 CFR 173.56. This includes oxygen generators installed in personal breathing equipment transported in accordance with Special Provision A144 of these Instructions.