
US C UNITED STATES

- US 1 Transport of dangerous goods by air must be in accordance with United States' Regulations (49 CFR 171-180) or these Technical Instructions as limited by 49 CFR 171.11. The requirements of 49 CFR 175 apply to all shipments made by air to, from, or within the United States, including when the shipment is prepared in accordance with these Technical Instructions. 1;1.4

When the Technical Instructions are used for consignments of dangerous goods, failure to comply with the Technical Instructions, and all relevant United States' variations is a violation of the United States' regulations.

The appropriate national authority for the United States is:

Associate Administrator for Hazardous Materials Safety
Research and Special Programs Administration
U.S. Department of Transportation
Washington, D.C. 20590-0001

English must be used for all required package markings and for the dangerous goods transport document. Abbreviations may not be used unless they are specifically authorized by these Instructions or by Subpart D of 49 CFR 172. 5;2.5
5;4.1.13

Note: The United States=Regulations, as well as interpretations regarding their use, are available via the internet at <http://hazmat.dot.gov/rules.htm>. Questions regarding the regulations may be directed to the Office of Hazardous Materials Safety= Information Center at (800) 467-4922, (202) 366-4488, or by e-mail to infocntr@rspa.dot.gov.

- US 2 In addition to the dangerous goods included in the Dangerous Goods List (Table 3-1) with the word 'Forbidden' shown in columns 2 and 3, any material forbidden for transport by the United States= Regulations is also forbidden for transport under any circumstances to, from, or within the United States (see 49 CFR 173.21 and the Hazardous Materials Table in 49 CFR 172.101). 1;2.1
3;1

Note: A list of materials forbidden from transport in 49 CFR 172.101 is available via the internet at <http://hazmat.dot.gov/icaovar.htm>

- US 3 For substances where this variation is identified in column 6 of Table 3-1 and A1 appears in column 7, the substance may not be transported to, from, or within the United States aboard a passenger aircraft without the prior approval of the appropriate authority of the U.S. For substances where this variation is identified in column 6 of Table 3-1 and A2 appears in column 7, the substance 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.) Oxygen generators, chemical, transported under UN 3356 also require approval for transport by cargo aircraft. Prototype lithium batteries and cells transported in accordance with special provision A88 and organic peroxides that are not identified by technical name in 49 CFR 173.225(b) must also be approved prior to transport. 3;1
(Table 3-1)
2:5.3.2.5

- 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 US carriers operating outside the US. 3;1

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:

- C it is a petroleum product that is a lubricant or fuel; or
- C 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 materials 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/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 of these Instructions 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. C 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. C 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/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. This includes but

	is not limited to liquids with a flash point (closed cup) greater than 60.5EC but less than 93EC (200EF) when transported in packagings with a capacity greater than 450 L. These materials are classified as Combustible Liquids (see 49 CFR 173.120).	
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 Exemptions and Approvals (DHM-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.	2;1.3
US 6	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 173.301 (j).	PI 200 S-3;12.2.2.1 Table 3-1
	Portable tanks must also be designed and approved in accordance with the requirements of 49 CFR 178.270 through 178.277.	
	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 non-toxic (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.	2;2 PI 203 PI 204 PI Y204 (UN 1950)
US 7	<i>Lighters (cigarettes)</i> or other similar devices containing flammable gas may not be transported to, from or within the United States unless the design of the device and its packaging insofar as they affect safety in transportation have been examined by the Bureau of Explosives (B of E) and approved by the appropriate authority of the U.S. (See US 1.)	3;1
	An approval which was previously issued by the B of E remains valid to the same extent as if it had been issued by the appropriate authority. Approval numbers issued by the B of E or the appropriate authority of the U.S. must be marked on each package and noted on each transport document.	
US 8	The transport of a liquid with a vapour inhalation toxicity meeting the criteria of Division 6.1, Packing Group I or a gas meeting the criteria of Division 2.3 is forbidden on passenger aircraft to, from or within the United States.	5;2 5;3 5;4 7;1.1
	The transport of a liquid with a vapour inhalation toxicity meeting the criteria of Division 6.1, Packing Group I or a gas meeting the criteria of Division 2.3 on a cargo aircraft to, from, or within the United States is subject to the following additional requirements:	
	a) <i>Description.</i> The description of the substance which appears on the dangerous goods transport document must include the words >Toxic-Inhalation Hazard= or >Poison-Inhalation Hazard= except the word >Toxic= or >Poison= need not be repeated if it otherwise appears in the description; and	
	b) <i>Marking.</i> The package must be marked with the words &Inhalation Hazard@ in association with required labels and any other markings required by these Instructions;	
	c) <i>Labeling.</i> The package must bear the Poison Inhalation Hazard Label (see 49 CFR	

172.429) or the Poison Gas Label (see 49 CFR 172.416) as appropriate.

- d) *Packaging.* Packaging must be in accordance with the requirements indicated for the liquid or gas in 49 CFR 172.101.

Note. C Many substances that are not listed specifically by name in Table 3-1 that are transported under an An.o.s.@entry may meet the above inhalation toxicity criteria. Furthermore, some listed substances also meet these criteria even though the class, division or subsidiary risk assignments identified for that substance in columns 3 and 4 of Table 3-1 may not so indicate. A list of these substances is available from the appropriate authority of the U.S. (See US 1), Attention: Office of Hazardous Materials Exemptions and Approvals, Dockets, (DHM-30) (202) 366-5046, facsimile (202) 366-3753.

US 10 The following additional requirements or limitations apply to the transport of radioactive materials to, from or within the United States:

- a) Radioactive material is defined as any material having a specific activity greater than 70 kBq/kg (2nCi/g). Other than excepted radioactive material, radioactive material 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. For transport aboard a passenger aircraft of other than excepted packagings, the transport document for the radioactive material must contain a certification stating that the shipment contains radioactive material intended for use in, or incident to, research or medical diagnosis or treatment. 5;1.3
7;1.1
- b) No person may offer for transport aboard a passenger aircraft a package with a transport index greater than 3.0 or an overpack with a transport index greater than 3.0.
- c) No person may offer or transport plutonium aboard an aircraft unless:
- 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 70 kBq/kg (2nCi/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.
- d) For a package containing radioactive material with an activity greater than:
- 1) 3 000 H A₁;
 - 2) 3 000 H A₂; or
 - 3) 1 000 TBq (27 000 Ci), whichever is least,
- the notation 'highway route controlled quantity' must appear on the transport document.
- e) A fissile material controlled shipment must be made: 7;2.9.4

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- 1) on an aircraft with no other labelled radioactive material on board; or,
 - 2) on a cargo aircraft consigned for exclusive use.

For all fissile material controlled shipments, specific arrangements must be made between the consignor and the operator with specific instructions issued with the transport document.

f) Packages in a fissile material controlled shipment and packages containing: 2;7.8.4

- 1) 3 000 H A₁;
- 2) 3 000 H A₂; or
- 3) 1 000 TBq (27 000 Ci); whichever is least,

must bear the Radioactive material, Class 7, Category III C Yellow label.

g) All type B(U), type B(M) and fissile package designs must be certified and packages with a total transport index exceeding 200 may not be transported except under special arrangements approved by the U.S. Department of Transportation. Requests for package design certification and approvals should be directed to the appropriate authority of the U.S. (see US 1), Attention: Radioactive Materials Branch (DHM-23). 6;7.7
6;7.8

h) 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. 49 CFR 173.431 and the Table of A1 and A2 values it references, 49 CFR 173.435, are available via the internet at <http://hazmat.dot.gov/icaovar.htm>.

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.

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;4.1.3
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 international access code and 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 hazardous material 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 of an agency or organization may be used. However, a person listing the telephone number of an agency or organization as the emergency response telephone number must ensure that the agency or organization has current information on the dangerous good(s).

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

Emergency response information. Emergency response information relative to the dangerous goods being transported must be immediately available at all times while the dangerous goods are 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 Part 5;4.1.2 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 Part 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 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;1.1
- b) A copy of the Transport document must be retained by the operator for not less than 90 days. 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 170 171-180, 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: 7;2
 - 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:

- i) Division 6.1 (poisonous) materials (except those labeled FLAMMABLE)
- ii) Materials in Division 6.2 (etiologic or infectious substances)
- iii) Class 3 (flammable liquid) materials with a flashpoint above 23 °C (73 °F) that do not meet the definition of another hazardous class

Each package containing dangerous goods acceptable only for cargo aircraft must be loaded so that it is accessible during flight.

- e) In the case of damage to, or leakage from, a package containing infectious substances within the United States, the operator must notify the nearest FAA Civil Aviation Security office immediately, or they may notify the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, immediately at telephone number: (404) 633-5313. 7;3.1.4

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 or smoke 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 850 liters (30 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 conforming 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:

- 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 850 liters (30 cubic feet);
- c) Each cylinder must conform to the requirements identified in US Variation 6 and must be overpacked. The overpack must conform to the performance criteria of Air Transport Association (ATA) Specification 300 for Category I; 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.