Hazardous Materials Carried by Airline Passengers and Crewmembers

In general, U.S. Department of Transportation (DOT) regulations prohibit passengers and crewmembers from carrying hazardous materials (dangerous goods) aboard commercial aircraft. The table below lists the exceptions that allow passengers and crewmembers to carry a limited amount of hazardous materials in carry-on and/or checked baggage. Though allowable by DOT regulations (see 49 CFR, section 175.10), some of the items listed here may, at times, be prohibited/limited in the aircraft cabin by Transportation Security Administration (TSA) rules (see <u>www.tsa.gov</u>). Individual airlines and other nations may also have more restrictive rules on what passengers can carry aboard the aircraft. See <u>http://www.faa.gov/go/packsafe</u> for additional guidance on hazmat in baggage.

Passenger Hazmat Exception	Allowed	Not Allowed	Regulatory Text 49 CFR 175.10(a)
Foiletry and medicinal articles including flammable and nonflammable aerosols when nozzles are protected	 ✓ Toiletry or medicinal articles that are hazardous materials such as rubbing alcohol, flammable perfume and colognes, nail polish and remover, and aerosols (hairspray, shaving cream, etc.) —in carry-on* or checked baggage. ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	Image: Second secon	(1) (i) Non-radioactive medicinal and toilet articles for personal use (including aerosols) carried in carry- on and checked baggage. Release devices on aerosols must be protected by a cap or other suitable means to prevent inadvertent release (ii) Other aerosols in Div. 2.2 (nonflammable gas) with no subsidiary risk carried in checked baggage only. Release devices on aerosols must be protected by a cap or other suitable means to prevent inadvertent release; and (iii) The aggregate quantity of these hazardous materials carried by each person may not exceed 2 kg (70 ounces) by mass or 2 L (68 fluid ounces) by volume and the capacity of each container may not exceed 0.3 kg (18 ounces) by mass or 500 ml (17 fluid ounces) by volume.
Additional nonflammable aerosols that are not medicinal or toilet articles Note: Nonflammable aerosols are rare.	✓ Non-toiletry aerosols that contain nonflammable & non-toxic gas— <u>in checked baggage only</u> .		*Liquids, gels, and aerosols in <u>carry-on baggage</u> are further limited to 100-ml (3.4 ounce) containers by TSA security checkpoint rules.

Passenger Hazmat Exception	Allowed	Not Allowed	Regulatory Text 49 CFR 175.10(a)
Matches and Lighters	 ✓ One packet of safety matches (regular matches) may be carried <u>on one's person (e.g., in your pocket) or in carry-on baggage</u>. ✓ One lighter (gas/butane or absorbed liquid/Zippo-style) may be carried <u>on one's person or in carry-on baggage</u>. ✓ Onel lighters (including torch lighters) in a DOT-approved container may be in <u>checked baggage</u>. 	<complex-block><complex-block></complex-block></complex-block>	(2) One packet of safety matches or a lighter intended for use by an individual when carried on one's person or in carry-on baggage only. Lighter fuel, lighter refills, and lighters containing unabsorbed liquid fuel (other than liquefied gas) are not permitted on one's person or in carry-on or checked baggage.
Implanted medical devices Radioactive medicines injected or ingested	✓ Pacemakers or similar devices and radio-pharmaceuticals contained in the body.	20	(3) Implanted medical devices in humans or animals that contain hazardous materials, such as a heart pacemaker containing Class 7 (radioactive) material or lithium batteries; and radio-pharmaceuticals that have been injected or ingested.

Passenger Hazmat Exception	Allowed	Not Allowed	Regulatory Text 49 CFR 175.10(a)
Alcoholic beverages	✓ Up to 5 liters of alcoholic beverages with an alcohol content of more than 24% but not more than 70% in unopened retail packages in carry-on* or checked baggage. ✓ ✓ <td< th=""><th>Is Alcoholic beverages with more than 70% alcohol by volume (more than 140 Proof) including 95% grain alcohol and 151-proof rum.</th><th>(4) Alcoholic beverages containing: (i) Not more than 24% alcohol by volume; or (ii) More than 24% and not more than 70% alcohol by volume when in unopened retail packagings not exceeding 5 liters (1.3 gallons) carried in carry-on or checked baggage, with a total net quantity per person of 5 liters (1.3) gallons for such beverages. * Quantities of alcohol placed in carry-on</th></td<>	Is Alcoholic beverages with more than 70% alcohol by volume (more than 140 Proof) including 95% grain alcohol and 151-proof rum.	(4) Alcoholic beverages containing: (i) Not more than 24% alcohol by volume; or (ii) More than 24% and not more than 70% alcohol by volume when in unopened retail packagings not exceeding 5 liters (1.3 gallons) carried in carry-on or checked baggage, with a total net quantity per person of 5 liters (1.3) gallons for such beverages. * Quantities of alcohol placed in carry-on
	by volume (beer, wine, etc.,) are not subject to the DOT hazardous materials regulations.*		baggage prior to the passenger screening checkpoint are further limited by TSA security rules. Customs rules may also further restrict the amount of alcohol carried by passengers on international flights.
Duty free perfume and cologne	✓ Flammable perfumes and colognes from the airport / airline duty free shops <u>carried</u> on one's person or in carry-on baggage.		(5) Perfumes and colognes purchased through duty-free sales and carried on one's person or in carry-on baggage.

Passenger Hazmat Exception	Allowed	Not Allowed	Regulatory Text 49 CFR 175.10(a)
Curling iron (cordless)	A curling iron with a flammable gas cartridge installed and safety cover in place.	Extra flammable gas cartridges.	(6) Hair curlers (curling irons) containing a hydrocarbon gas such as butane, no more than one per person, in carry-on or checked baggage. The safety cover must be securely fitted over the heating element. Gas refills for such curlers are not permitted in carry-on or checked baggage.
Small mercury medical thermometer	Small personal mercury thermometer in a protective case.		(7) A small medical or clinical mercury thermometer for personal use, when carried in a protective case in carry-on or checked baggage.
Small arms ammunition Note: For rules on carrying unloaded firearms in checked baggage, visit the TSA website: http://www.tsa.gov	✓ Small arms ammunition (up to 19.1 mm (.75 caliber) for rifle and pistol cartridges, any size shotgun shells) for personal use, when securely boxed and carried in checked baggage only.	 Loose ammunition Loaded firearms Black powder Primers Percussion caps 	(8) Small arms ammunition for personal use carried by a crewmember or passenger in checked baggage only, if securely packed in boxes or other packagings specifically designed to carry small amounts of ammunition. Ammunition clips and magazines must also be securely boxed. This paragraph does not apply to persons traveling under the provisions of 49 CFR 1544.219.
Self-defense spray	✓ One small (4-ounces or less) self-defense spray, protected from accidental activation, and carried in <u>checked baggage</u> only.*	 Defense sprays containing more than 2% tear gas (CS, CN, etc.). Defense sprays larger than 4 ounces. 	 (9) One self-defense spray (see § 171.8 of this subchapter), not exceeding 118 mL (4 fluid ounces) by volume, that incorporates a positive means to prevent accidental discharge may be carried in checked baggage only. * Self-defense sprays are usually forbidden even in checked baggage outside the U.S.

Prepared by the FAA Office of Hazardous Materials Safety (<u>www.faa.gov/go/hazmatsafety</u>) **Updated December 6, 2013** (previous editions obsolete)

Passenger Hazmat Exception	Allowed	Not Allowed	Regulatory Text 49 CFR 175.10(a)
Dry ice	✓ Up to 2.5 kg (5.5 lbs.) of dry ice per person in <u>carry-on or checked baggage</u> in a package that allows venting of carbon dioxide gas.	I Dry ice in air-tight packages.	 (10) Dry ice (carbon dioxide, solid), with the approval of the operator: (i) Quantities may not exceed 2.5 kg (5.5 pounds) per person when used to pack perishables not subject to the HMR. The package must permit the release of carbon dioxide gas; and (ii) When carried in checked baggage, each package is marked "DRY ICE" or "CARBON DIOXIDE, SOLID," and marked with the net weight of dry ice or an indication the net weight is 2.5 kg (5.5 pounds) or less.
Self-inflating lifejacket	✓ A life jacket containing two nonflammable gas cartridges in carry-on or checked baggage.		(11) A self-inflating life jacket fitted with no more than two small gas cartridges (containing no hazardous material other than a Div. 2.2 gas) for inflation purposes plus no more than two spare cartridges. The lifejacket and spare cartridges may be carried in carry-on or checked baggage, with the approval of the aircraft operator.
Gas cylinders for mechanical limbs	✓ Nonflammable gas cylinders/cartridges in mechanical limbs plus spares in <u>checked or carry-on baggage</u> .		(12) Small compressed gas cylinders of Division 2.2 (containing no hazardous material other than a Division 2.2 gas) worn by the passenger for the operation of mechanical limbs and, in carry-on and checked baggage, spare cylinders of a similar size for the same purpose in sufficient quantities to ensure an adequate supply for the duration of the journey.

Passenger Hazmat Exception	Allowed	Not Allowed	Regulatory Text 49 CFR 175.10(a)
Mercury barometer or thermometer	✓ Larger mercury thermometers and barometers carried by government weather personnel in carry-on baggage only. Must be in leak-proof, mercury-proof packaging.		(13) A mercury barometer or thermometer carried as carry-on baggage, by a representative of a government weather bureau or similar official agency, provided that individual advises the operator of the presence of the barometer or thermometer in his baggage. The barometer or thermometer must be packaged in a strong packaging having a sealed inner liner or bag of strong, leak proof and puncture- resistant material impervious to mercury, which will prevent the escape of mercury from the package in any position.
Heat-producing equipment (battery operated)	 Diving lamps and other battery-operated extreme heat producing equipment in <u>carry-on</u> <u>or checked baggage</u>. Energy source or a heat producing component must be disconnected or removed. 		(14) Electrically powered heat- producing articles (e.g., battery- operated equipment such as diving lamps and soldering equipment) as checked or carry-on baggage only and with the approval of the operator of the aircraft. The heat-producing component, the energy source, or other component (e.g., fuse) must be removed to prevent unintentional functioning during transport. Any battery that is removed must be protected against short circuit by placement in original retail packaging or by otherwise insulating terminals (e.g., by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch).

Passenger Hazmat Exception	Allowed	Not Allowed	Regulatory Text 49 CFR 175.10(a)
Wheelchairs and mobility devices with <u>wet</u> <u>nonspillable</u> or <u>dry</u> <u>sealed batteries</u>	✓ Wheelchair or other battery powered mobility device equipped with a nonspillable battery <u>when carried as checked</u> <u>baggage</u> .		(15) A wheelchair or other battery- powered mobility aid equipped with a nonspillable battery or a dry sealed battery when carried as checked baggage, provided—
See separate entry for lithium ion battery			(i) The battery conforms to the requirements of § 173.159a(d) of this subchapter for non-spillable batteries;
			(ii) The battery conforms to the requirements of § 172.102(c)(1), Special provision 130 of this subchapter for dry sealed batteries, as applicable;
	Nonspillable or dry sealed battery		(iii) Visual inspection including removal of the battery, where necessary, reveals no obvious defects (removal of the battery from the housing should be performed by qualified airline personnel only);
			(iv) The battery is disconnected and the battery terminals are protected to prevent short circuits, unless the wheelchair or mobility aid design provides an effective means of preventing unintentional activation, and
			(A) Securely attached to the wheelchair or mobility aid;
			(B) Is removed and placed in a strong, rigid packaging marked "NONSPILLABLE BATTERY" (unless fully enclosed in a rigid housing that is properly marked);
			(C) Is removed and placed in a strong, rigid packaging marked with the words "not restricted" in accordance with paragraph (c)(2) of § 172.102(c)(1), Special provision 130, of this subchapter; or
			(D) Is handled in accordance with paragraph (a)(16)(iv) of this section.

Passenger Hazmat Exception	Allowed	Not Allowed	Regulatory Text 49 CFR 175.10(a)
Wheelchairs and mobility devices with <u>wet spillable</u> batteries	✓ Wheelchair or other battery powered mobility device equipped with a <u>spillable battery when carried as checked baggage</u> . Device must be stowed so the battery must be disconnected and packaged separately.		 (16) A wheelchair or other battery-powered mobility aid equipped with a spillable battery, when carried as checked baggage, provided— (i) Visual inspection including removal of the battery, where necessary, reveals no obvious defects (however, removal of the battery from the housing should be performed by qualified airline personnel only); (ii) The battery is disconnected and terminals are insulated to prevent short circuits; (iii) The pilot-in-command is advised, either orally or in writing, prior to departure, as to the location of the battery aboard the aircraft; and (iv) The wheelchair or mobility aid is loaded, stowed, secured and unloaded in an upright position, or the battery is removed, and carried in a strong, rigid packaging under the following conditions: (A) The packaging must be leak-tight and impervious to battery fluid. An inner liner may be used to satisfy this requirement if there is absorbent material placed inside of the liner and the liner has a leakproof closure; (B) The battery must be protected against short circuits, secured upright in the packaging, and be packaged with enough compatible absorbent material to completely absorb liquid contents in the event of rupture of the battery; and (C) The packaging must be labeled with a CORROSIVE label, marked to indicate proper orientation, and marked with the words "Battery, wet, with wheelchair."

Passenger	Allowed	Net Allewed	Regulatory Text
Hazmat Exception	Allowed	Not Allowed	49 CFR 175.10(a)
Wheelchairs and mobility devices with <u>lithium ion</u> <u>batteries</u>	✓ Wheelchair or other battery powered mobility device equipped with a <u>lithium ion</u> <u>battery</u> (rechargeable lithium battery) carried as <u>checked</u> <u>baggage</u> .		 (17) A wheelchair or other mobility aid equipped with a lithium ion battery, when carried as checked baggage, provided— (i) The lithium ion battery must be of a type that successfully passed each test in the UN Manual of Tests and Criteria (IBR; see §171.7 of this subchapter), as specified in §173.185 of this subchapter, unless approved by the Associate Administrator;
			 (ii) The operator must verify that: (A) Visual inspection of the wheelchair or other mobility aid reveals no obvious defects; (B) Battery terminals are protected from short circuits (e.g., enclosed within a battery housing); (C) The battery must be securely attached to the mobility aid; and (D) Electrical circuits are isolated;
	Lithium ion battery		(iii) The wheelchair or other mobility aid must be loaded and stowed in such a manner to prevent its unintentional activation and its battery must be protected from short circuiting;
			(iv) The wheelchair or other mobility aid must be protected from damage by the movement of baggage, mail, service items, or other cargo;
	✓ If a collapsible mobility device has an unprotected removable lithium ion battery, the battery must be removed. terminals protected, and carried in carry-on baggage—with airline approval.		 (v) Where a lithium ion battery-powered wheelchair or other mobility aid is specifically designed to allow its battery to be removed by the user (e.g., collapsible): (A) The battery must be removed from the wheelchair or other mobility aid according to instructions provided by the wheelchair or other mobility aid owner or its manufacturer; (B) The battery must be carried in carry-on baggage only; (C) Battery terminals must be protected from short circuits (by placement in original retail packaging or otherwise insulating the terminal e.g., by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch); (D) The battery must not exceed 25 grams aggregate equivalent lithium content; and (E) A maximum of one spare battery not exceeding 25 grams aggregate equivalent lithium content or two spares not exceeding 13.5 grams aggregate equivalent lithium content each may be carried;
			(vi) The pilot-in-command is advised either orally or in writing, prior to departure, as to the location of the lithium ion battery or batteries aboard the aircraft.

Passenger Hazmat Exception	Allowed	Not Allowed	Regulatory Text 49 CFR 175.10(a)
Batteries in portable electronic devices Spare batteries for these devices	 Batteries installed in portable electronic devices may be in carry-on* and checked baggage. Image: Image: Imag	 Spare lithium metal and lithium ion batteries in checked baggage. Loose batteries not protected from short circuit. Wet batteries. Vehicle batteries. See separate entry for battery-powered wheelchairs and mobility devices. 	 (18) Except as provided in § 173.21 of this subchapter, portable electronic devices (for example, watches, calculating machines, cameras, cellular phones, lap-top and notebook computers, camcorders, etc.) containing cells or batteries (including lithium cells or batteries) and spare batteries and cells for these devices, when carried by passengers or crew members for personal use. Each spare battery must be individually protected so as to prevent short circuits (by placement in original retail packaging or by otherwise insulating terminals, e.g., by taping over exposed terminals or placing each battery in a separate plastic bag or protective pouch) and carried in carry-on baggage only. In addition, each installed or spare battery must comply with the following: (i) For a lithium metal battery, a lithium content of not more than 2 grams per battery; or (ii) For a lithium ion battery, an aggregate equivalent lithium content of not more than 2 grams but not more than 8 grams but not more than 25 grams may be carried. (iii) For a non-spillable battery, the battery and equipment must conform to § 173.159a(d). Each battery must not exceed a voltage greater than 12 volts and a watt-hour rating of not more than 100 Wh. No more than two individually protected spare batteries must be carried in checked or carry-on baggage.

Passenger	Allowed	Not Allowed	Regulatory Text
Hazmat Exception	/		49 CFR 175.10(a)
Fuel cells for portable electronic devices	 Image: Preside the set of the set o	Image: Second control of the second	 (19) Fuel cells used to power portable electronic devices (<i>e.g.</i>, cameras, cellular phones, laptop computers and camcorders) and spare fuel cell cartridges when transported personal use under the following conditions: (i) Fuel cells and fuel cell cartridges may contain only Division 2.1 liquefied flammable gas, or hydrogen in a metal hydride, Class 3 flammable liquid (including methanol), Division 4.3 waterreactive material, or Class 8 corrosive material; (ii) The quantity of fuel in any fuel cell or fuel cell cartridge may not exceed: (A) 200 mL (6.76 ounces) for liquefied gases in non-metallic fuel cell cartridges, or 200 mL (6.76 ounces) for liquefied gases in metal fuel cell cartridges; (C) 200 g (7 ounces) for solids; or (D) For hydrogen in metal hydride, the fuel cell cartridges must have a water capacity of 120 mL (4 fluid ounces) or less; (iii) No more than two spare fuel cell cartridges may be carried by a passenger or crew member as follows: (A) Fuel cell cartridges containing Class 3 flammable liquid (including methanol) and Class 8 corrosive material in carry-on or checked baggage; and (B) Division 2.1 liquefied flammable gas or hydrogen in a metal hydride and Division 4.3 water-reactive material in carry-on baggage only; (iv) Fuel cells containing fuel are permitted in carry-on baggage only; (vi) Fuel cells containing fuel are permitted in carry-on baggage only; (vi) Refueling of a fuel cell and naircraft is not permitted except that the installation of a spare cartridge is allowed; (vii) Each fuel cell and fuel cell cartridge must conform to IEC 62282-6-100 and IEC 62282-6-100 a

Passenger Hazmat Exception	Allowed	Not Allowed	Regulatory Text 49 CFR 175.10(a)
Permeation devices for calibrating air quality monitoring equipment	Small permeation devices containing hazardous materials in checked baggage only. Devices must be in double layers of hermetically sealed inner packaging and then a strong outer packaging.		(20) Permeation devices for calibrating air quality monitoring equipment when carried in checked baggage provided the devices are constructed and packaged in accordance with § 173.175.
Internal combustion or fuel cell engines	✓ Engines and engine-powered equipment carried <u>as checked baggage</u> if all fuel (including residue and vapors) is completely removed. Engine must not have a battery or other hazardous materials. Image: Checked baggage if all fuel (including residue and vapors) is completely removed. Engine must not have a battery or other hazardous materials. Image: Checked baggage if all fuel (including residue and vapors) is completely removed. Engine must not have a battery or other hazardous materials. Image: Checked baggage if all fuel (including residue and vapors) is completely removed. Engine must not have a battery or other hazardous materials. Image: Checked baggage if all fuel (including residue and vapors) is completely removed. Engine must not have a battery or other hazardous materials. Image: Checked baggage if all fuel (including residue and vapors) is completely removed. Engine must not have a battery or other hazardous materials. Image: Checked baggage if all fuel (including residue and vapors) is completely removed. Engine must not have a battery or other hazardous materials. Image: Checked baggage if all fuel (including residue and vapors) is completely removed. Engine must not have a battery or other hazardous materials. Image: Checked baggage if all fuel (including residue and vapors) is completely removed. Engine must not have a battery or other hazardous materials. Image: Checked baggage if all fuel (including residue and vapors) is completely removed. Engine and vapors) is completely removed. Image: Checked baggage if all fuel (including residue and vapors) is completely removed. Engine and vapors) is completely removed. Engine and vapors) is completely r	Equipment that still has fuel in it, including residue or vapors.	 (21) An internal combustion or fuel cell engine or a machine or apparatus containing an internal combustion or fuel cell engine when carried as checked baggage, provided— (i) The engine contains no liquid or gaseous fuel. An engine may be considered as not containing fuel when the engine components and any fuel lines have been completed drained, sufficiently cleaned of residue, and purged of vapors to remove any potential hazard and the engine when held in any orientation will not release any liquid fuel; (ii) The fuel tank contains no liquid or gaseous fuel. A fuel tank may be considered as not containing fuel when the fuel tank and the fuel lines have been completely drained, sufficiently cleaned of residue, and purged of vapors to remove any potential hazard; (iii) It is not equipped with a wet battery (including a non-spillable battery), a sodium battery or a lithium battery; and (iv) It contains no other hazardous materials subject to the requirements of this subchapter.

Passenger Hazmat Exception	Allowed	Not Allowed	Regulatory Text 49 CFR 175.10(a)
Specimens in formaldehyde or alcohol solutions	 ✓ Non-infectious specimens in formaldehyde* or alcohol solutions in <u>carry-on or checked baggage</u>. Inner containers must contain no more than 30 ml of the formaldehyde or alcohol solution. The aggregate quantity of formaldehyde or alcohol solution must not exceed one liter (1 L) for the entire outer packaging.** See 49 CFR 173.4b(b) for full packaging requirements. 		 (22) Non-infectious specimens transported in accordance with § 173. 4b(b). * Formaldehyde solutions containing less than 10% formaldehyde are not restricted as hazardous materials. Two layers of leakproof packaging are still recommended. **Liquids in carry-on baggage are further limited by TSA security rules.
Liquid nitrogen dry shippers	 ✓ Liquid nitrogen in a dry shipper (insulated shipping flask that absorbs liquid nitrogen into an inner liner) carried as checked or carry-on baggage. All liquid must be absorbed. Packaging must allow nitrogen gas to vent. 		(23) Insulated packagings containing refrigerated liquid nitrogen when carried in checked or carry-on baggage in accordance with the ICAO Technical Instructions (IBR, see § 171.7 of this subchapter), Packing Instruction 202, the packaging specifications in part 6, chapter 5, and special provision A152.
Small nonflammable cartridges and gas cylinders	Small gas cartridges (50 ml volume or less) in or with a device. Up to four cartridges total. Spare cartridges should be securely packed.	I Cartridges/cylinders with a volume larger than 50 ml (larger than 28 grams carbon dioxide cartridge).	(24) Small cartridges fitted into devices with no more than four small cylinders of carbon dioxide or other suitable gas in in Division 2.2. The water capacity of each cylinder must not exceed 50 mL (equivalent to a 28g carbon dioxide cartridge), with the approval of the operator. <i>TSA security rules prohibit air</i> <i>guns and many other powered</i> <i>devices in carry-on baggage. Air</i> <i>guns in checked baggage may</i> <i>not have cartridges installed.</i>