Dangerous Goods	Location: Checked baggage	Location: Carry-on baggage	Approval of the operator(s) is required	Restrictions
Batteries				
1) Lithium batteries (including portable electronic devices)	Yes (except for g) and h))	Yes	(see c) and d))	a) each battery must be of a type which meets the requirements of each test in the UN *Manual of Tests and Criteria*, Part III, subsection 38.3; b) each battery must not exceed the following: — for lithium metal batteries, a lithium content of 2 grams; or — for lithium ion batteries, a Watt-hour rating of 100 Wh; c) each battery may exceed 100 Wh but not exceed 160 Wh Watt-hour rating for lithium ion with the approval of the operator; d) each battery may exceed 2 grams but not exceed 8 grams lithium content for lithium metal for portable medical electronic devices with the approval of the operator; e) batteries contained in portable electronic devices should be carried as carry-on baggage; however, if carried as checked baggage: — measures must be taken to prevent unintentional activation and to protect the devices from damage; and — the devices must be completely switched off (not in sleep or hibernation mode); f) batteries and heating elements must be isolated in portable electronic devices capable of generating extreme heat, which could cause a fire if activated, by removal of the heating element, battery or other components; g) spare batteries, including power banks: — must be carried as carry-on baggage; and — 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); h) baggage equipped with a lithium battery(ies) exceeding: — for lithium metal batteries, a lithium content of 0.3 grams; or — for lithium ion batteries, a Watt-hour rating of 2.7 Wh must be carried as carry-on baggage unless the battery(ies) is removed from the baggage, in which case the battery(ies) must be carried in accordance with g); i) no more than two spare batteries meeting the requirements of c) or d) may be carried per person.
2) Non-spillable batteries	Yes	Yes	No	a) must meet the requirements of Special Provision A67; b) each battery must not exceed a voltage of 12 volts and a Watt-hour rating of 100 Wh; c) each battery must be protected from short circuit by the effective insulation of exposed terminals; d) no more than two spare batteries per person may be carried; and e) if contained in equipment, the equipment must be either protected from unintentional activation, or each battery must be disconnected and its exposed terminals insulated.

Dangerous Goods	Location: Checked baggage	Location: Carry-on baggage	Approval of the operator(s) is required	Restrictions
3) Battery-powered portable electronic smoking devices (e.g. e-cigarettes, ecigs, ecigars, epipes, personal vaporizers, electronic nicotine delivery systems)	No	Yes	No	a) if powered by lithium batteries, each battery must comply with restrictions of 1) a), b) and g); b) the devices and/or batteries must not be recharged on board the aircraft; and c) measures must be taken to prevent unintentional activation of the heating element while on board the aircraft.
4) Battery-powered mobility aids (e.g. wheelchairs)	Yes	(see d))	Yes	a) for use by passengers whose mobility is restricted by either a disability, their health or age, or a temporary mobility problem (e.g. broken leg); b) the passenger should make advance arrangements with each operator and provide information on the type of battery installed and on the handling of the mobility aid (including instructions on how to isolate the battery); c) in the case of a non-spillable wet battery: i) each battery must comply with Special Provision A67; and ii) a maximum of one spare battery may be carried per passenger; d) in the case of a lithium ion battery: i) each battery must be of a type which meets the requirements of each test in the *UN Manual of Tests and Criteria*, Part III, subsection 38.3; ii) when the mobility aid does not provide adequate protection to the battery: — the battery must be removed in accordance with the manufacturer's instructions; — the battery must not exceed 300 Wh; — the battery terminals must be protected from short circuit (by insulating the terminals, e.g. by taping over exposed terminals); — the battery must be protected from damage (e.g. by placing each battery in a protective pouch); and — the battery must be carried in the cabin; iii) a maximum of one spare battery not exceeding 300 Wh or two spare batteries not exceeding 160 Wh each may be carried. Spare batteries must be carried in the cabin.

	Dangerous Goods	Location: Checked baggage	Location: Carry-on baggage	Approval of the operator(s) is required	Restrictions
Flames and fuel sources					
5)	Cigarette lighter Small packet of safety matches	No	(see b))	No	a) no more than one per person; b) must be carried on the person; c) must not contain unabsorbed liquid fuel (other than liquefied gas); and d) if a cigarette lighter is powered by lithium batteries, each battery must comply with restrictions of 1) a), b) and g) and 3) b) and c).
6)	Alcoholic beverages containing more than 24 per cent but not more than 70 per cent alcohol by volume	Yes	Yes	No	a) must be in retail packagings; and b) no more than 5 L total net quantity per person. *Note.— Alcoholic beverages containing not more than 24 per cent alcohol by volume are not subject to any restrictions.*
7)	Internal combustion engines or fuel cell engines	Yes	No	No	Measures must be taken to nullify the hazard. a) for flammable liquid powered engines: i) the engine is powered by a fuel that does not meet the classification criteria for any class or division; or ii) the fuel tank of the vehicle, machine or other apparatus has never contained any fuel or the fuel tank has been flushed and purged of vapours and adequate measures taken to nullify the hazard; and iii) the entire fuel system of the engine has no free liquid and all fuel lines are sealed or capped or securely connected to the engine and vehicle, machinery or apparatus. b) for flammable gas powered internal combustion or fuel cell engines: i) the entire fuel system must have been flushed, purged and filled with a non-flammable gas or fluid to nullify the hazard; and ii) the final pressure of the non-flammable gas used to fill the system does not exceed 200 kPa at 20°C;
8)	Fuel cells containing fuel	No	Yes	No	a) fuel cell cartridges may only contain flammable liquids, corrosive substances, liquefied flammable gas, water reactive substances or hydrogen in metal hydride; b) refuelling of fuel cells on board an aircraft is not permitted except that the installation of a spare cartridge is allowed; c) the maximum quantity of fuel in any fuel cell or fuel cell cartridge must not exceed: — for liquids 200 mL; — for solids 200 grams; — for liquefied gases, 120 mL for non-metallic fuel cell cartridges or 200 mL for metal fuel cell or fuel cell cartridges; and — for hydrogen in metal hydride, the fuel cell or fuel cell cartridges must have a water capacity of 120 mL or less; d) each fuel cell and each fuel cell cartridge must conform to IEC 62282-6-100 Ed. 1, including Amendment 1, and must be marked with a manufacturer's certification that it conforms to the specification. In addition, each fuel cell cartridge must be marked with the maximum quantity and type of fuel in the cartridge; e) fuel cell cartridges containing hydrogen in metal hydride must comply with the requirements in Special Provision A162; f) no more than two spare fuel cell cartridges may be carried by a passenger;
	Spare fuel cell cartridges	Yes	Yes	No	

Dangerous Goods	Location: Checked baggage	Location: Carry-on baggage	Approval of the operator(s) is required	Restrictions
				g) fuel cells containing fuel are permitted in carry-on baggage only; h) interaction between fuel cells and integrated batteries in a device must conform to IEC 62282-6-100 Ed. 1, including Amendment 1. Fuel cells whose sole function is to charge a battery in the device are not permitted; i) fuel cells must be of a type that will not charge batteries when the portable electronic device is not in use and must be durably marked by the manufacturer: "APPROVED FOR CARRIAGE IN AIRCRAFT CABIN ONLY" to so indicate; and j) in addition to the languages which may be required by the State of Origin for the markings specified above, English should be used.
Gases in cylinders and cartridges				
9) Cylinders of oxygen or air required for medical use	Yes	Yes	Yes	a) no more than 5 kg gross mass per cylinder; b) cylinders, valves and regulators, where fitted, must be protected from damage which could cause inadvertent release of the contents; c) advance arrangements recommended; and d) the pilot-in-command must be informed of the number of oxygen or air cylinders loaded on board the aircraft and their loading location(s).
10) Cartridges of Division 2.2 worn for the operation of mechanical limbs	Yes	Yes	No	Spare cartridges of a similar size are also allowed, if required, to ensure an adequate supply for the duration of the journey.
11) Cartridge of hydrocarbon gas contained in hair styling equipment	Yes	Yes	No	a) no more than one per person; b) the safety cover must be securely fitted over the heating element; and c) spare cartridges must not be carried.
12) Cartridges of Division 2.2 with no subsidiary hazard fitted into a self-inflating personal safety device such as a life-jacket or vest	Yes	Yes	Yes	a) no more than one personal safety device per person; b) the personal safety device must be packed in such a manner that it cannot be accidentally activated; c) must be for inflation purposes; d) no more than two cartridges are fitted into the device; and e) no more than two spare cartridges.
13) Cartridges of Division 2.2 with no subsidiary hazard for other than a self-inflating personal safety device	Yes	Yes	Yes	a) no more than four cartridges per person; and b) the water capacity of each cartridge must not exceed 50 mL. *Note.— For carbon dioxide, a gas cartridge with a water capacity of 50 mL is equivalent to a 28 g cartridge.*
14) Cartridges and cylinders of Division 2.2 with no subsidiary hazard contained in an avalanche rescue backpack	Yes	Yes	Yes	a) no more than one avalanche rescue backpack per person; b) the backpack must be packed in such a manner that it cannot be accidentally activated; c) may contain a pyrotechnic trigger mechanism which must not contain more than 200 mg net of Division 1.4S; and d) the airbags within the backpack must be fitted with pressure relief valves.
Radioactive material				
15) Radioisotopic cardiac pacemakers or other medical devices	n/a (see restrictions)	n/a (see restrictions)	No	Must be implanted into a person or fitted externally as the result of medical treatment.

Dangerous Goods	Location		Approval of the operator(s) is required	Restrictions
	Checked baggage	Carry-on baggage		
Mercury				
16) Small medical or clinical thermometer which contains mercury	Yes	No	No	a) no more than one per person; and b) must be in its protective case.
Other dangerous goods				
17) Non-radioactive medicinal articles (including aerosols), toiletry articles (including aerosols) and aerosols in Division 2.2 with no subsidiary hazard	Yes	Yes	No	a) no more than 0.5 kg or 0.5 L total net quantity per single article; b) no more than 2 kg or 2 L total net quantity of all articles (e.g. four aerosol cans of 0.5 L each) per person; c) release valves on aerosols must be protected by a cap or other suitable means to prevent inadvertent release of the contents; and d) the release of gas must not cause extreme annoyance or discomfort to crew members so as to prevent the correct performance of assigned duties.
18) Dry ice	Yes	Yes	Yes	a) no more than 2.5 kg per person; b) used to pack perishables that are not subject to thes Technical Instructions; c) the package must permit the release of carbon dioxide gas; and d) when carried as checked baggage, each package must be marked: i) "DRY ICE" or "CARBON DIOXIDE, SOLID"; and ii) the net weight of dry ice or an indication that the net weight is 2.5 kg or less.
19) Cartridges in Division 1.4S (UN 0012 or UN 0014 only)	Yes	No	Yes	a) no more than 5 kg gross mass per person; b) must be securely packaged; c) must not include ammunition with explosive or incendiary projectiles; and d) allowances for more than one person must not be combined into one or more packages.
20) Permeation devices	Yes	No	No	Instructions on how to package permeation devices for calibrating air quality monitoring equipment are found in Special Provision A41.
21) Non-infectious specimens in flammable solutions	Yes	Yes	No	Instructions on how to package and mark specimens are found in Special Provision A180.
22) Refrigerated liquid nitrogen	Yes	Yes	No	Must be contained in insulated packagings (e.g. dry shippers) that would not allow the build-up of pressure and be fully absorbed in a porous material so that there is no free liquid that could be released from the packaging. Refer to Special Provision A152 for more information.
23) Dangerous goods incorporated in security-type equipment, such as attaché cases, cash boxes, cash bags, etc.	Yes	No	Yes	The security-type equipment must be equipped with an effective means of preventing accidental activation and the dangerous goods incorporated in the equipment must meet the conditions of Special Provision A178.

Special Provision A41

Permeation devices that contain dangerous goods and that are used for calibrating air quality monitoring devices are not subject to these Instructions when carried as cargo provided the following requirements are met:

a) Each device must be constructed of a material compatible with the dangerous goods it contains;
b) The total contents of dangerous goods in each device is limited to 2 millilitres and the device must not be liquid full at 55°C;
c) Each permeation device must be placed in a sealed, high impact-resistant, tubular inner packaging of plastic or equivalent material. Sufficient absorbent material must be contained in the inner packaging to completely absorb the contents of the device. The closure of the inner packaging must be securely held in place with wire, tape or other positive means;
d) Each inner packaging must be contained in a secondary packaging constructed of metal, or plastic having a minimum thickness of 1.5 mm. The secondary packaging must be hermetically sealed;
e) The secondary packaging must be securely packed in strong outer packaging. The completed package must be capable of withstanding, without breakage or leakage of any inner packaging and without significant reduction in effectiveness:
    i) the following free drops onto a rigid, non-resilient, flat and horizontal surface from a height of 1.8 m:
        - one drop flat on the bottom;
        - one drop flat on the top;
        - one drop flat on the long side;
        - one drop flat on the short side;
        - one drop on a corner at the junction of three intersecting edges; and
    ii) a force applied to the top surface for a duration of 24 hours, equivalent to the total weight of identical packages if stacked to a height of 3 m (including the test sample).

    Note.— Each of the above tests may be performed on different but identical packages.
f) The gross mass of the completed package must not exceed 30 kg.

Special Provision A67

Batteries can be considered as non-spillable provided that they are capable of withstanding the vibration and pressure differential tests given below, without leakage of battery fluid.

Vibration test: The battery is rigidly clamped to the platform of a vibration machine and a simple harmonic motion having an amplitude of 0.8 mm (1.6 mm maximum total excursion) is applied. The frequency is varied at the rate of 1 Hz/min between the limits of 10 Hz to 55 Hz. The entire range of frequencies and return is traversed in 95 ± 5 minutes for each mounting position (direction of vibration) of the battery. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for equal time periods.

Pressure differential test: Following the vibration test, the battery is stored for six hours at 24°C ±4°C while subjected to a pressure differential of at least 88 kPa. The battery must be tested in three mutually perpendicular positions (to include testing with fill openings and vents, if any, in an inverted position) for at least six hours in each position.

Note.— Non-spillable type batteries which are an integral part of, and necessary for the operation of, mechanical or electronic equipment must be securely fastened in the battery holder on the equipment and protected in such a manner so as to prevent damage and short circuits.

Non-spillable batteries are not subject to these Instructions when carried as cargo if, at a temperature of 55°C, the electrolyte will not flow from a ruptured or cracked case. The battery must not contain any free or unabsorbed liquid. Any electrical battery or battery powered device, equipment or vehicle having the potential of dangerous evolution of heat must be prepared for transport so as to prevent:

a) a short circuit (e.g. in the case of batteries, by the effective insulation of exposed terminals; or, in the case of equipment, by disconnection of the battery and protection of exposed terminals); and
b) unintentional activation.

Source – ICAO Doc 9284 Technical Instructions for the Safe Transport of Dangerous Goods by Air 2019-2020 Edition

The words "not restricted" and the special provision number A67 must be provided on the air waybill when an air waybill is issued.

Special Provision A162

A162 (339) Fuel cell cartridges containing hydrogen in a metal hydride transported under this entry must have a water capacity less than or equal to 120 mL.

The pressure in the fuel cell cartridge must not exceed 5 MPa at 55°C. The design type must withstand, without leaking or bursting, a pressure of two (2) times the design pressure of the cartridge at 55°C or 200 kPa more than the design pressure of the cartridge at 55°C, whichever is greater. The pressure at which this test is conducted is referred to in the drop test and the hydrogen cycling test as the "minimum shell burst pressure".

Fuel cell cartridges must be filled in accordance with procedures provided by the manufacturer. The manufacturer must provide the following information with each fuel cell cartridge:

a) inspection procedures to be carried out before initial filling and before refilling of the fuel cell cartridge;
b) safety precautions and potential hazards to be aware of;
c) method for determining when the rated capacity has been achieved;
d) minimum and maximum pressure range;
e) minimum and maximum temperature range; and
f) any other requirements to be met for initial filling and refilling including the type of equipment to be used for initial filling and refilling.

The fuel cell cartridges must be designed and constructed to prevent fuel leakage under normal conditions of transport. Each cartridge design type, including cartridges integral to a fuel cell, must be subjected to and must pass the following tests:

Drop test

A 1.8 metre drop test onto an unyielding surface in four different orientations:

a) vertically, on the end containing the shut-off valve assembly;
b) vertically, on the end opposite to the shut-off valve assembly;
c) horizontally, onto a steel apex with a diameter of 38 mm, with the steel apex in the upward position; and
d) at a 45° angle on the end containing the shut-off valve assembly.

There must be no leakage, determined by using a soap bubble solution or other equivalent means on all possible leak locations, when the cartridge is charged to its rated charging pressure. The fuel cell cartridge must then be hydrostatically pressurized to destruction. The recorded burst pressure must exceed 85 per cent of the minimum shell burst pressure.

Fire test

A fuel cell cartridge filled to rated capacity with hydrogen must be subjected to a fire engulfment test. The cartridge design, which may include a vent feature integral to it, is deemed to have passed the fire test if:

a) the internal pressure vents to zero gauge pressure without rupture of the cartridge; or
b) the cartridge withstands the fire for a minimum of 20 minutes without rupture.

Hydrogen cycling test

This test is intended to ensure that a fuel cell cartridge design stress limits are not exceeded during use. The fuel cell cartridge must be cycled from not more than 5 per cent rated hydrogen capacity to not less than 95 per cent rated hydrogen capacity and back to not more than 5 per cent rated hydrogen capacity.

The rated charging pressure must be used for charging and temperatures must be held within the operating temperature range. The cycling must be continued for at least 100 cycles.

Source – ICAO Doc 9284 Technical Instructions for the Safe Transport of Dangerous Goods by Air 2019-2020 Edition

Following the cycling test, the fuel cell cartridge must be charged, and the water volume displaced by the cartridge must be measured. The cartridge design is deemed to have passed the hydrogen cycling test if the water volume displaced by the cycled cartridge does not exceed the water volume displaced by an uncycled cartridge charged to 95 per cent rated capacity and pressurized to 75 per cent of its minimum shell burst pressure.

Production leak test

Each fuel cell cartridge must be tested for leaks at 15°C ± 5°C, while pressurized to its rated charging pressure. There must be no leakage, determined by using a soap bubble solution or other equivalent means on all possible leak locations.

Each fuel cell cartridge must be permanently marked with the following information:

a) the rated charging pressure in megapascals (MPa);
b) the manufacturer's serial number of the fuel cell cartridges or unique identification number; and
c) the date of expiry based on the maximum service life (year in four digits; month in two digits).

Special Provision A180

Non-infectious specimens, such as specimens of mammals, birds, amphibians, reptiles, fish, insects and other invertebrates containing small quantities of UN 1170, UN 1198, UN 1987 or UN 1219 are not subject to these Instructions provided the following packing and marking requirements are met:

a) specimens are:
    1) wrapped in paper towel and/or cheesecloth moistened with alcohol or an alcohol solution and then placed in a plastic bag that is heat-sealed. Any free liquid in the bag must not exceed 30 mL; or
    2) placed in vials or other rigid containers with no more than 30 mL of alcohol or an alcohol solution;
b) the prepared specimens are then placed in a plastic bag that is then heat-sealed;
c) the bagged specimens are then placed inside a another plastic bag with absorbent material then heatsealed;
d) the finished bag is then placed in a strong outer packaging with suitable cushioning material;
e) the total quantity of flammable liquid per outer packaging must not exceed 1 L; and
f) the completed package is marked "scientific research specimens, not restricted Special Provision A180 applies".

The words "not restricted" and the special provision number A180 must be provided on the air waybill when an air waybill is issued.

Special Provision A178

Security type equipment such as attaché cases, cash boxes, cash bags, etc., incorporating dangerous goods, for example lithium batteries, gas cartridges and/or pyrotechnic material, are not subject to these Instructions if the equipment complies with the following:

a) The equipment must be equipped with an effective means of preventing accidental activation;
b) If the equipment contains an explosive or pyrotechnic substance or an explosive article, this article or substance must be excluded from Class 1 by the appropriate national authority of the State of Manufacture in compliance with Part 2;1.5.2.1;
c) If the equipment contains lithium cells or batteries, these cells or batteries must comply with the following restrictions:
    1) for a lithium metal cell, the lithium content is not more than 1 g;
    2) for a lithium metal or lithium alloy battery, the aggregate lithium content is not more than 2 g;
    3) for lithium ion cells, the Watt-hour rating (see Attachment 2) is not more than 20 Wh;
    4) for lithium ion batteries, the Watt-hour rating is not more than 100 Wh;
    5) each cell or battery is of the type proven to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, section 38.3;
d) If the equipment contains gases to expel dye or ink, only gas cartridges and receptacles, small, containing gas with a capacity not exceeding 50 mL, containing no constituents subject to these Instructions other than a Division 2.2 gas, are allowed. The release of gas must not cause extreme annoyance or discomfort to crew

members so as to prevent the correct performance of assigned duties. In case of accidental activation, all hazardous effects must be confined within the equipment and must not produce extreme noise.

e) Security type equipment that is defective or that has been damaged is forbidden for transport.

The words "not restricted" and the special provision number A178 must be provided on the air waybill when an air waybill is issued.

Special Provision A152

Insulated packagings conforming to the requirements of Packing Instruction 202 containing refrigerated liquid nitrogen fully absorbed in a porous material are not subject to these Instructions provided the design of the insulated packaging would not allow the build-up of pressure within the container and would not permit the release of any refrigerated liquid nitrogen irrespective of the orientation of the insulated packaging and any outer packaging or overpack used is closed in a way that will not allow the build-up of pressure within that packaging or overpack. When used to contain substances not subject to these Instructions, the words "not restricted" and the special provision number A152 must be provided on the air waybill when an air waybill is issued.