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7 August 2025

Civil Aviation Authority of Singapore

Advisory Circular

GUIDANCE ON FULFILLING A SHIPPER'S RESPONSIBILITIES

GENERAL

Advisory Circulars (ACs) are issued by the Director-General of Civil Aviation (DGCA) from time to time to provide practical guidance or certainty in respect of the statutory requirements for aviation safety. ACs contain information about standards, practices and procedures acceptable to CAAS. An AC may be used, in accordance with section 11 of the Air Navigation Act 1966 (ANA), to demonstrate compliance with a statutory requirement. The revision number of the AC is indicated in parenthesis in the suffix of the AC number.

PURPOSE

This AC provides guidance to a shipper and its agents (freight forwarders, packers, logistics service providers etc.) on fulfilling the shipper's responsibilities in the transport of dangerous goods by air and information related to Regulation 18 of the Air Navigation (92 – Carriage of Dangerous Goods) Regulations 2022 ("ANR-92").

APPLICABILITY

This AC is applicable to a shipper and its agents offering dangerous goods (as defined in the First Schedule of ANR-92) and non-dangerous goods / general cargo for transport by air.

RELATED REGULATIONS

This AC relates specifically to Regulation 18 of ANR-92.

RELATED ADVISORY CIRCULARS

Nil

CANCELLATION
Revision 1 of this AC supersedes revision 0. This revision provides additional guidance on the application of a signature on the dangerous goods transport document.

EFFECTIVE DATE
Revision 1 of this AC is effective from 7 August 2025.

OTHER REFERENCES
• IATA Dangerous Goods Regulations Manual

1 INTRODUCTION

1.1 In accordance with regulation 18(1) of ANR-92, a shipper including its agent, are responsible for ensuring that dangerous goods forbidden in any circumstances are not consigned for transport by air and any dangerous goods offered for transport are properly classified, packed, marked, labelled and accompanied by a dangerous goods transport document in accordance with the safety requirements of ICAO TI. Employees of a shipper or its agents must also provide relevant information to enable employees to fulfill their responsibilities in the carriage of dangerous goods.

1.2 While this regulation obligates a shipper or its agents offering dangerous goods for transport by air to comply with ICAO TI, it should be noted that when a shipper or its agent inadvertently offers undeclared dangerous goods for transport in a general cargo consignment, it would contravene regulation 18(1) of ANR-92.

2 COMPLY WITH ICAO TI AND PREVENT TRANSPORT OF UNDECLARED DANGEROUS GOODS

2.1 To ensure that dangerous goods offered for transport by air complies with the safety requirements of ICAO TI and undeclared dangerous goods are prevented from inadvertently being offered in general cargo consignments, a shipper and its agents should:

(a) establish and implement operations procedures to guide its employees and staff of its service providers (collectively known as operations personnel) responsible for receiving, preparing and handling goods intended for transport by air;

(b) ensure that operations personnel responsible for receiving, preparing, and handling dangerous goods are competent in fulfilling their responsibilities in the transport of dangerous goods as cargo through competency-based dangerous goods training and assessment; and

(c) ensure that operations personnel responsible for receiving, preparing and handling non-dangerous goods for transport as general cargo consignments are provided with information to aid in the identification of hidden dangerous goods.

<u>Establish and Implement Operations Procedures</u>

2.2 To ensure consistency in the execution of work processes necessary to achieve compliance with safety regulations in the transport of goods, a shipper and its agents should establish, document and implement operations procedures to guide its operations personnel in performing their job functions.

2.3 Organisations should clearly identify the operations personnel (e.g., by designation) responsible for each process in its operations procedures and the desired performance outcome to be achieved upon completion of each process or group of tasks. In the design of its procedures, care should be taken to minimise human related errors during implementation by sequencing tasks in a logical flow or by incorporating the use of a checklist for complex processes.

2.4 A shipper or its agents may outsource some of its functions (e.g., packing, warehousing, transportation etc.) to service providers for various reasons. When functions associated with the transport of dangerous goods are outsourced, a shipper or its agents should establish operations procedures relevant to the outsourced functions to guide the staff of its service providers or alternatively ensure that its service providers establish those procedures for its staff.

2.5 In the implementation of its procedures, a shipper and its agents should provide an adequate level of supervision necessary to ensure that its operations personnel adhere to its operations procedures when performing their job functions. In addition to supervisory staff monitoring day to day operations, organisations should also consider conducting quality inspections or audits of its operations by competent personnel. Such measures may aid in identifying procedural gaps, overcoming challenges faced by operations personnel and providing quality assurance in the delivery of services by organisations.

2.6 Periodically, operations procedures may need to be amended in response to changes to safety regulations in the transport of dangerous goods or to reflect actual operational processes based on observations during quality inspections / audits or feedback from operations personnel. Hence, a shipper and its agents should regularly review its procedures to ensure that changes to work processes are documented in a timely manner.

2.7 As such procedures are intended to guide operations personnel in the performance of their job functions relating to the transport of dangerous goods, a shipper and its agents should ensure that up to date procedures are accessible to operations personnel at places where its operations are conducted. Operations procedures may be made available in hardcopy or in softcopy (e.g., via a shared drive or shared computer terminals).

3 SHIPPERS AND ITS AGENTS OFFERING DANGEROUS GOODS FOR TRANSPORT

Scope of Operations Procedures

3.1 A shipper and its agents intending to offer dangerous goods for transport by air should establish and implement operations procedures commensurate with its responsibilities and the scale of its operations, and which may include the following processes:

(a) Classify the substance or article according to the dangerous goods classification criteria specified in the ICAO TI or, if the shipper is not the manufacturer of the substance or article, verify the classification of the dangerous goods with its supplier or manufacturer (e.g., by reviewing the safety data sheet of the dangerous goods – refer to Annex D);

(b) Identify the proper shipping name and UN number of each article and substance based on its dangerous goods classification;

(c) Verify that the dangerous goods are not those forbidden for transport under any circumstances;

(d) Pack the dangerous goods according to the packing instruction applicable to its UN number;

(e) Apply dangerous goods marks and labels on packages;

(f) Complete the dangerous goods transport document (shipper's declaration for dangerous goods) and the air waybill;

(g) Receive the dangerous goods packages, account for its quantity and inspect them to verify that the packages are in good condition and are not damaged;

(h) Store the dangerous goods packages and protecting them from damage and pilferage;

(i) Segregate dangerous goods that may react dangerously with each other (incompatible dangerous goods) during storage, handling and transport; and

(j) Inspect the packages for any signs of damage and verify that accompanying documents have accurately declared the dangerous goods contents prior to offering the packages for acceptance by an air operator or its handling agent.

3.2 Since a shipper and its agents are responsible for fulfilling the shipper's responsibilities when offering dangerous goods for transport by air, it should be noted that all the processes necessary to ensure compliance with the requirements of ICAO TI may not be performed by a single entity. Consequently, a shipper and its agents should work collaboratively to define each organisation's responsibilities in the transport of dangerous goods by air and to establish operations procedures to fulfill their respective responsibilities.

Training of Operations Personnel

3.3 Competency of the workforce is vital in ensuring safety in the transport of dangerous goods by air. A shipper and its agents have to ensure that its operations personnel, having responsibilities in the transport of dangerous goods by air, are trained and assessed to be competent prior to deploying them to perform their job functions.

3.4 Dangerous goods training may be provided by employers through in-house developed training programmes or outsourced to external training service providers. Regardless of which entity provides the training, training should consist of knowledge training (e.g., classroom, e-learning, briefings etc.) and skills training (e.g., on-the-job training,

simulation etc.) and covering general familiarization training, function specific training and safety training. Following the provision of training, an assessment to verify each operations personnel's acquisition of competencies necessary to perform their intended job functions should be successfully completed prior to their operational deployment.

3.5 For further guidance on the development and implementation of competency-based dangerous goods training programmes, employers may refer to AC-92-3-1 – *Competency-Based Dangerous Goods Training Programme*.

Dangerous Goods Forbidden Under Any Circumstances

3.6 A shipper and its agents must not offer for transport by air dangerous goods that are forbidden under any circumstances. Such dangerous goods are articles or substances that are liable to explode, dangerously react, produce a flame or dangerous evolution of heat or dangerous emission of toxic, corrosive or flammable gases or vapours under conditions normally encountered in transport.

3.7 Some dangerous goods that are known to meet this description are listed in the List of Dangerous Goods of the IATA Dangerous Goods Regulations Manual where entries of proper shipping names are shown in light text, without a UN number and the word "*Forbidden*" are shown in columns G/H, I/J and K/L. Examples include *Copper acetylide*, *Ethyl hydroperoxide*, and *Nitrogen triiodide*. However, it should be noted that not all such dangerous goods are listed in this manual. Hence, shippers and its agents should exercise due diligence and care to prevent such dangerous goods from being offered for transport by air.

Dangerous Goods Forbidden Unless Exempted

3.8 Some forbidden dangerous goods do not meet the description for identification as dangerous goods forbidden under any circumstances but nevertheless present a high safety risk to aircraft and its occupants when transported by air. Such dangerous goods may only be transported on an aircraft in exceptional circumstances and provided exemptions have been granted by the various States concerned (i.e., States of Origin, Operator, Transit, Overflight and Destination).

3.9 In addition to exemptions granted by other States concerned, the transport of such dangerous goods from Singapore will require an administrative relief from having to comply with the applicable requirements of ICAO TI granted by the Director-General of Civil Aviation (DGCA) in accordance with regulation 26 of ANR-92. For guidance on the application of this administrative relief, shippers and its agents may refer to AC 92-4-1 – *Administrative Relief from Technical Instructions Compliance*.

Shipper-Built ULDs / Bulk Unitisation Program

3.10 When implemented by air operators under its Bulk Unitisation Program (BUP), a shipper or its agents may offer consignments for transport by air where the goods are loaded by the shipper or its agent into one or more unit load devices (ULDs). However, when a consignment is offered for transport by air in this manner, shippers and freight forwarders are prohibited from loading any dangerous goods into a ULD other than:

- Radioactive materials in a freight container;
- ID 8000, *Consumer commodity,* prepared according to Packing Instruction Y963;

- UN 1845, *Dry ice*, prepared according to Packing Instruction 954 when used as a refrigerant for non-dangerous goods, UN 3373 - *Biological substance, Category B* or ID 8000 -*Consumer commodity*;

- UN 2807, *Magnetized material,* where an approval under regulation 10 of ANR-92 is not required;

- UN 3373, *Biological substance, Category B*, prepared according to Packing Instruction 650;

- UN 3245, *Genetically modified organisms* or *Genetically modified microorganisms,* prepared according to Packing Instruction 959;

- Lithium ion or lithium metal cells and batteries meeting the applicable provisions of Section II of Packing Instructions 966, 967, 969 or 970;

- UN 3164, *Articles, pressurized, hydraulic,* or *Articles pressurized, pneumatic,* prepared according to Packing Instruction 208 (paragraph (a) only);

- Dangerous goods in excepted quantities; and

- Radioactive materials in excepted quantities.

Signature on Dangerous Goods Transport Document

3.11 Regulation 18(1)(c)(i)(C) requires that the dangerous goods transport document includes a declaration signed by the shipper or its agent. A handwritten signature is typically applied when the document is not submitted to the air operator via Electronic Data Processing (EDP) or Electronic Data Interchange (EDI) transmission methods.

3.12 A signature on the dangerous goods transport document generally serves to[1]:

(a) Establish the signer's identity. The signature -
- should be uniquely recognisable as belonging to the individual shipper or agent. A simple handwritten letter or mark (e.g., writing "A" or "X") that could be easily replicable by anyone is not considered a signature, even if handwritten, as it does not help to identify the signer;
- should be consistently reproduced by the same individual across different documents;
- should contain elements that make it distinguishable.

(b) Show authenticity. The signature -
- should demonstrate the personal involvement of the signer;
- should be handwritten. Typed signatures, mechanical reproductions, or stamps are not acceptable;
- should show deliberate execution rather than a casual mark.

(c) Signify the responsibility undertaken by the signer for document contents. The signature -
- shows the signer has verified the document's contents;
- indicates acceptance and accountability of the information provided.

[1] Reference "*United Nations Commission on International Trade Law* publication on *"Promoting confidence in electronic commerce: legal issues on international use of electronic authentication and signature methods"*

3.13 To ensure the integrity of the document, alterations or amendments to any information, other than the air waybill number, airport of departure, or airport of destination, should be signed (adjacent to the alteration or amendment) by the same individual who prepared the original document, using the same signature as that applied to the declaration.

Use of IATA Dangerous Goods Regulations Manual to Comply with ICAO TI

3.14 Published annually, the International Air Transport Association's (IATA) Dangerous Goods Regulations Manual contains all the safety requirements as specified in the ICAO TI and industry best practices that shippers, air operators and their agents need to comply with in the transport of dangerous goods by air. A shipper and its agents preparing and handling dangerous goods intended for transport by air according to the current edition of this reference manual will achieve compliance with the safety requirements of ICAO TI.

4 SHIPPERS AND ITS AGENTS OFFERING NON-DANGEROUS GOODS FOR TRANSPORT

4.1 A shipper of non-dangerous goods should be forthcoming in identifying any articles or substances that may potentially be dangerous goods and communicate this information to its agents such as its freighter forwarder or its logistics service provider. This is to ensure that compliance with the requirements of ICAO TI is verified prior to offering such goods for transport to an air operator.

4.2 Freight forwarders, as agents of shippers, should be mindful that shippers of general cargo consignments may not have undergone dangerous goods training and may not be aware that some of its goods offered for transport by air are classified as dangerous goods according to safety regulations. Hence, to prevent undeclared or hidden dangerous goods from inadvertently being offered for transport on an aircraft, freight forwarders should diligently review the descriptions of goods specified on documents provided by the shipper and look out for signs (such as markings and labels) that packages of goods may potentially contain hidden dangerous goods. To educate shippers, freight forwarders are encouraged to share the contents of this AC and the information in the accompanying annexes with its customers.

4.3 To prevent contravening safety regulations, a shipper and its agents must ensure that general consignments do not contain any articles or substances that may be classified as dangerous goods, prior to offering such cargo consignments for transport.

Scope of Operations Procedures

4.4 A shipper and its agents offering general cargo consignments for transport by air should establish and implement procedures to guide its operations personnel in verifying that hidden dangerous goods are not among the contents of such consignments. Its operations procedures may comprise of the following processes:

(a) Identify if the shipper or supplier of the goods is in the business of trading or dealing in articles or substances that may potentially be classified as dangerous goods (e.g., suppliers of chemicals, gases, batteries, pharmaceutical products,

petrochemical products, ship spares etc., or the shipper is a laboratory, a hospital etc.);

(b) Review the descriptions and information of goods in product specifications, supplier invoices, commercial invoices and packing lists to identify those that may be classified as dangerous goods (e.g., the descriptions containing names of chemical substances, gases, batteries or equipment / devices that may contain batteries etc.);

(c) Receive and inspect each package of goods for signs that may suggest that its contents are dangerous goods (e.g., presence of dangerous goods labels or markings, *United Nations Globally Harmonized System of Classification and Labelling of Chemicals* (GHS) pictograms, smell of chemicals or flammable fumes, evidence of oil stains, emitting visible smoke etc.);

(d) For articles of substances suspected to contain dangerous goods, verify the dangerous goods classification of the goods with its shipper, supplier or manufacturer (e.g., by reviewing the safety data sheet of the substance or article);

(e) For articles or substances confirmed to be dangerous goods, verify if it is not subjected to the requirements of ICAO TI when transported by air according to a special provision thus permitting it to be transported as a general cargo consignment (e.g., Refrigerated machines (UN2857) containing less than 12 kg of a gas in Division 2.2 according to ICAO TI special provision A26);

(f) Segregate and store / stage general cargo consignments separately from dangerous goods consignments;

4.5 Due to time constraints, freight forwarders may at times arrange for goods consigned for transport by air to be delivered from the shipper or its supplier's premise directly to the air cargo terminal for acceptance by an air operator's cargo handling service provider without first receiving them at the freight forwarder's premise and undergoing the necessary checks and verifications. In such instances, freight forwarders should take the necessary measures, including inspecting the packages by its staff or transport service provider enroute to the air cargo terminal, to ensure that such general cargo consignments are free from hidden dangerous goods prior to offering them for transport by air.

Provide Information to Operations Personnel

4.6 To aid in the implementation of its procedures, a shipper and its agents should provide relevant information to guide its operations personnel having responsibilities in the offering and preparation of goods for transport as general cargo consignments.

4.7 In addition to operations procedures, information to aid operations personnel in the identification of dangerous goods include:

(a) Reviewing descriptions of goods;

(b) Identifying dangerous goods marks and labels and GHS pictograms and labels; and

(c) Using Safety Data Sheet (SDS) to determine the dangerous goods classification of a substance or article.

4.7.1 **Reviewing descriptions of goods** - Descriptions of the goods offered for transport by air by shippers are often listed on transport invoices or packing lists. To aid other organisations in the transport chain in determining the nature of the goods, shippers should accurately describe articles or substances intended to be offered for transport on such documents. Using part numbers or stock keeping numbers to identify products on transport invoices and packing lists should be avoided since external parties would not be able to determine the nature of the goods based on these numbers alone.

4.7.2 Many common consumer and household products are classified as dangerous goods when transported by air. Some examples include:

- perfumery and cosmetic products containing alcohol;
- aerosol cans / dispensers;
- paint and its related products;
- fire extinguishers;
- compressed gas cylinders; and
- power banks and devices containing batteries.

4.7.3 Such dangerous goods may also be hidden behind general descriptions thus hindering their ready identification by transport chain entities. To aid shippers and its agents in identifying hidden dangerous goods, Annex A - *Hidden Dangerous Goods List*, contains a comprehensive list of general descriptions of articles of substances and the potential hidden dangerous goods that may be subsumed under such descriptions.

4.7.4 When reviewing documents provided by shippers, freight forwarders should identify descriptions that are similar or match those that are listed in Annex A. When identified, freight forwarders should seek clarification from shippers or the supplier of the goods to ensure that products matching those descriptions do not contain hidden dangerous goods prior to offering them for transport.

4.7.5 **Identifying dangerous goods marks and labels and GHS pictograms and labels** - Marks and labels pre-printed or affixed to the outer packaging of goods may suggest that its contents are classified as dangerous goods. These marks and labels are often applied by the manufacturer or supplier of the goods based on its dangerous goods classification to facilitate multimodal transportation. Examples of dangerous goods marks and labels can be found in Annex B – *Dangerous Goods Marks and Labels*.

4.7.6 In addition to dangerous goods marks and labels, pictograms showing symbols that resemble those found on dangerous goods hazard labels may also be found

on labels affixed to packages containing substances that are subjected to compliance with GHS hazard communication standards. While GHS pictograms and labels are for the purpose of communicating hazards of substances to end-users and emergency responders and are not required for the purpose of transportation, such pictograms and labels may suggest that their contents are classified as dangerous goods when offered for transport by air. Examples of GHS pictograms and labels can be found in Annex C – *GHS Pictograms and Labels*.

4.7.7 Shippers and freight forwarders should thoroughly inspect its goods and packages of goods to identify if they bear any of the dangerous goods marks or labels or GHS pictograms or labels shown in Annex B and C respectively. When identified, shippers and freight forwarders should seek further clarification from its suppliers or manufacturers of the articles or substances to determine if the contents are classified as dangerous goods. If the articles of substances are classified as dangerous goods, the shipper and freight forwarder must ensure that the consignment complies with all the applicable requirements of ICAO TI prior to offering them for transport by air.

4.7.8 **Using Safety Data Sheet (SDS) to determine the dangerous goods classification of a substance** - In the implementation of GHS, manufacturers and suppliers of chemical substances are obligated to provide users with Safety Data Sheets (SDS - also known as Material Safety Data Sheets (MSDS)) containing information about hazards that are inherent in the substances. Consisting of comprehensive information arranged into 16 sections, SDS enables employers to manage hazardous chemicals at the workplace by implementing measures to protect its workers and the environment.

4.7.9 Section 14, *Transport information*, of a SDS contains information relating to conveying the chemical substance by various modes of transport including transporting by air. Shippers and its agents may utilise this information to determine if a chemical substance is classified as dangerous goods when transported by air. Further guidance on using this information to determine the dangerous goods classification of chemical substances can be found in Annex D – *Transport Information in Safety Data Sheet*.

4.7.10 Shippers and its agents should note that SDS is only applicable to chemical substances but not articles such as equipment, devices or batteries. Notwithstanding this, some manufacturers and suppliers have also provided SDS for some articles (e.g., lithium batteries).

4.8 A shipper and its agents should consider incorporating the information in this section and the accompanying annexes of this AC into its operations procedures or provide them separately to its operations personnel to aid in their identification of hidden dangerous goods. A shipper and its agents are also encouraged to display posters showing samples of dangerous goods marks and labels and GHS pictograms and labels at work areas designated for the collection and receiving of goods to remind and aid operations personnel in looking out for marks, labels and pictograms on packages of goods which may suggest that its contents are dangerous goods.

<u>Recycling Dangerous Goods Packaging for the Transport of General Cargo Consignments</u>

4.9 Due to the robustness of packaging used in the transport of dangerous goods, it is not uncommon for shippers to recycle them for use in the transport of non-dangerous goods. Should articles or substances intended for transport by air be determined by the shipper or its agent to be non-dangerous goods, all dangerous goods marks and labels and irrelevant GHS pictograms and labels on such packages of goods must be removed or completely obliterated prior to offering the packages for transport by air. This is to prevent air operators or its agents accepting and loading the packages on aircraft from mistakenly identifying such packages to contain undeclared dangerous goods.

4.10 To avoid ambiguity, it is recommended that the words "*Not Restricted*" be specified on the air waybill or an appropriate document accompanying a general cargo consignment containing any article of substance that could be suspected of being classified as dangerous goods but have been verified by the shipper or its agent to not meet the criteria for classification in any hazard class or division according to ICAO TI.

4.11 When offering empty gas cylinders for transport by air, a shipper and its agents should ensure that such cylinders are completely empty or are purged such that they do not contain any residual gases meeting the criteria for classification in any hazard class or division. It is also recommended that the statement "*Empty Gas Cylinders*" be specified on the air waybill or an appropriate document accompanying a consignment of such cylinders.

Dangerous Goods Transported as Not Restricted According to an ICAO TI Special Provision

4.12 Some articles or substances are not subjected to the regulations when transported as cargo provided they comply with the specific requirements specified in an applicable special provision of ICAO TI.

4.13 For example, aerosols, gas cartridges and receptables with a capacity not exceeding 50 ml and containing only non-flammable, non-toxic gases would normally be classified as dangerous goods in Division 2.2 and have to comply with applicable safety requirements of ICAO TI when transported by air. However, ICAO TI (and IATA's dangerous goods regulations manual) special provision A98 specifies that such dispensers are not subjected to the requirements of ICAO TI provided that the release of gases from such dispensers do not cause extreme annoyance or discomfort to crew members that would prevent the correct performance of their duties on board an aircraft. When this requirement is met, such dispensers may be transported as general cargo consignments without having to comply with the labelling, marking and documentation requirements applicable to regulated dangerous goods.

4.14 To avoid being identified as undeclared dangerous goods when offering articles or substances that are not subject to the regulations by application of a special provision for transport by air, ICAO TI requires that the words "*Not Restricted, as per Special Provision A* [special provision number]" be specified on the air waybill. This statement should be adjacent to the description of the article or substance in the *Nature and Quantity of Goods* column on the air waybill. For example, "*Cold spray for sports use. Not Restricted, as per Special Provision A98*".

Storage of Goods at Shipper or Agent's Premise

4.15 When receiving, staging or storing goods intended for transport by air at its premises, a shipper and its agents should segregate goods that are classified as dangerous goods

from those that are not. This minimises the risk of dangerous goods being inadvertently offered for transport by air as non-dangerous goods cargo consignments due to mishandling by operations personnel. Similarly, goods pending the shipper, supplier or manufacturer's confirmation of its dangerous goods classification should be isolated or suitably labelled so that they are not mistakenly offer for transport to an air operator before the verification could be completed.

5 ENQUIRIES

4.16 Should you have any queries regarding the contents of this AC, you may e-mail to us at CAAS_DangerousGoods@caas.gov.sg.

ANNEX A – HIDDEN DANGEROUS GOODS LIST

Suppliers, shippers and freight forwarders intending to offer for transport general cargo by air may declare its goods under one or more general descriptions (e.g., chemicals, electrical equipment, ship spares etc.) instead of providing a breakdown or itemised list of items to accurately describe the nature of goods. The following table identifies the potential hidden dangerous goods that may be present within such general description of goods.

General Description of Goods	Potential Hidden Dangerous Goods within such General Descriptions
Aircraft on ground (AOG) spares	may contain explosives (flares or other pyrotechnics), chemical oxygen generators, unserviceable tire assemblies, cylinders of compressed gas (oxygen, carbon dioxide or fire extinguishers), fuel in equipment, wet or lithium batteries, matches
Automobile parts/supplies (car, motor, motorcycle)	may include engines, including fuel cell engines, carburettors or fuel tanks that contain or have contained fuel, wet or lithium batteries, compressed gases in tire inflation devices and fire extinguishers, air bags, flammable adhesives, paints, sealants and solvents, etc.
Battery-powered devices/equipment	may contain wet or lithium batteries.
Breathing apparatus	may indicate cylinders of compressed air or oxygen, chemical oxygen generators or refrigerated liquefied oxygen
Camping equipment	may contain flammable gases (butane, propane, etc.), flammable liquids (kerosene, gasoline, etc.) or flammable solids (hexamine, matches, etc.)
Cars, car parts	see automobile parts, etc.
Chemicals	may contain items meeting any of the criteria for dangerous goods, particularly flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances
Consolidated consignments (groupages)	may contain any of the defined classes of dangerous goods
Cryogenic (liquid)	indicates refrigerated liquefied gases such as argon, helium, neon, nitrogen, etc.
Cylinders	may contain compressed or liquefied gas
Dental apparatus	may contain flammable resins or solvents, compressed or liquefied gas, mercury and radioactive material

Diagnostic specimens	may contain infectious substances
Diving equipment	may contain cylinders of compressed gas (e.g. air or oxygen). May also contain high intensity diving lamps that can generate extreme heat when operated in air. In order to be carried safely, the bulb or battery should be disconnected
Drilling and mining equipment	may contain explosive(s) and/or other dangerous goods
Dry shipper (vapour shipper)	may contain free liquid nitrogen. Dry shippers are not subject to these Instructions only when they do not permit the release of any free liquid nitrogen irrespective of the orientation of the packaging
Electrical/electronic equipment	may contain magnetized material, mercury in switch gear, electron tubes, wet or lithium batteries or fuel cells or fuel cell cartridges that contain or have contained fuel
Electrically powered apparatus (wheelchairs, lawnmowers, golf carts, etc.)	may contain wet or lithium batteries or fuel cells or fuel cell cartridges that contain or have contained fuel
Expeditionary equipment	may contain explosives (flares), flammable liquids (gasoline), flammable gas (gas for camping equipment) or other dangerous goods
Film crew and media equipment	may contain explosive pyrotechnic devices, generators incorporating internal combustion engines, wet or lithium batteries, fuel, heat-producing items, etc.
Frozen embryos	may be packed in refrigerated liquefied gas or dry ice
Frozen fruits, vegetables, etc.	may be packed in dry ice (solid carbon dioxide)
Fuel control units	may contain flammable liquids
Hot-air balloon	may contain cylinders with flammable gas, fire extinguishers, engines internal combustion, batteries, etc.
Household goods	may contain items meeting any of the criteria for dangerous goods. Examples include flammable liquids such as solvent-based paint, adhesives, polishes, aerosols, bleach, corrosive oven or drain cleaners, ammunition, matches, etc.
Instruments	may conceal barometers, manometers, mercury switches, rectifier tubes, thermometers, etc., containing mercury

Laboratory/testing equipment	may contain items meeting any of the criteria for dangerous goods, particularly flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances, lithium batteries, cylinders of compressed gas, etc.
Machinery parts	may contain flammable adhesives, paints, sealants and solvents, wet and lithium batteries, mercury, cylinders of compressed or liquefied gas, etc.
Magnets and other items of similar material	may individually or cumulatively meet the definition of magnetized material
Medical supplies/equipment	may contain items meeting any of the criteria for dangerous goods, particularly flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances, lithium batteries
Metal construction material	may contain ferromagnetic material which may be subject to special stowage requirements due to the possibility of affecting aircraft instruments
Metal fencing	may contain ferromagnetic material which may be subject to special stowage requirements due to the possibility of affecting aircraft instruments
Metal piping	may contain ferromagnetic material which may be subject to special stowage requirements due to the possibility of affecting aircraft instruments
Passengers' baggage	may contain items meeting any of the criteria for dangerous goods not permitted to be carried by passengers in baggage
Pharmaceuticals	may contain items meeting any of the criteria for dangerous goods, particularly radioactive material, flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances
Photographic supplies/equipment	may contain items meeting any of the criteria for dangerous goods, particularly heat-producing devices, flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances, lithium batteries
Racing car or motorcycle team equipment	may contain engines, including fuel cell engines, carburettors or fuel tanks that contain fuel or residual fuel, wet and lithium batteries, flammable aerosols, nitromethane or other gasoline additives, cylinders of compressed gases, etc.
Refrigerators	may contain liquefied gases or an ammonia solution

Repair kits	may contain organic peroxides and flammable adhesives, solvent-based paints, resins, etc.
Samples for testing	may contain items meeting any of the criteria for dangerous goods, particularly infectious substances, flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances
Semen	may be packed with dry ice or refrigerated liquefied gas (see also dry shipper)
Ships' spares	may contain explosives (flares), cylinders of compressed gas (life rafts), paint, lithium batteries (emergency locator transmitters), etc.
Sporting goods/sports team equipment	may contain cylinders of compressed or liquefied gas (air, carbon dioxide, etc.), lithium batteries, propane torches, first aid kits, flammable adhesives, aerosols, etc.
Swimming pool chemicals	may contain oxidizing or corrosive substances
Switches in electrical equipment or instruments	may contain mercury
Tool boxes	may contain explosives (power rivets), compressed gases or aerosols, flammable gases (Butane cylinders or torches), flammable adhesives or paints, corrosive liquids, lithium batteries, etc.
Torches	micro torches and utility lighters may contain flammable gas and be equipped with an electronic starter. Larger torches may consist of a torch head (often with a self-igniting switch) attached to a container or cylinder of flammable gas
Unaccompanied passengers' baggage/personal effects	may contain items meeting any of the criteria for dangerous goods not permitted to be carried by passengers in baggage
Vaccines	may be packed in dry ice (solid carbon dioxide)

ANNEX B – DANGEROUS GOODS MARKS AND LABELS

Marks and labels are used to identify dangerous goods and communicate their hazards, handling and other information to operations personnel when such goods are transported by air as cargo consignments. Consequently, the presence of such marks and labels on the outer surface of packages intended for transport by air would suggest that its contents meet the criteria for classification as dangerous goods.

Hazard Labels

Some dangerous goods may have more than one hazardous characteristic and multiple dangerous goods articles or substances may also be packed in multiple inner packaging within an outer packaging. To communicate all the hazards of dangerous goods present within a package, dangerous goods transport regulations require applicable hazard labels to be affixed to the outer surface of packages containing such goods. Hazard labels are set in a diamond shape and recognizable by its symbol, class/division number and color representing the various hazards within the nine classes of dangerous goods. The hazard labels used in the transport of dangerous goods by air and their descriptions are illustrated as follows:

Explosives in Divisions 1.1 to 1.3 where ** indicates the division number and compatibility group letter

Explosives in Divisions 1.4 where *** indicates the compatibility group letter

Explosives in Divisions 1.5 where *** indicates the compatibility group letter

Explosives in Divisions 1.6 where *** indicates the compatibility group letter

Flammable gas, Division 2.1

Non-flammable, non-toxic gas, Division 2.2

Toxic gas, Division 2.3

Flammable liquid, Class 3

Flammable solid, Division 4.1

Substance liable to spontaneous combustion Division 4.2

Substance which, in contact with water, emit flammable gas Division 4.3

Oxidizing substance Division 5.1

Organic peroxide Division 5.2

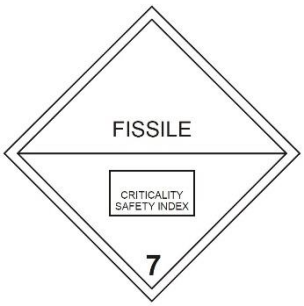
Toxic substance Division 6.1

Infectious substance Division 6.2

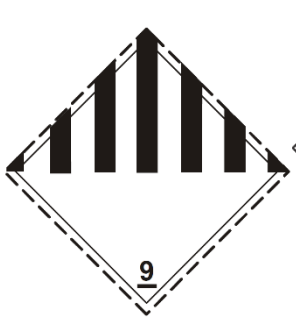
Radioactive material, Category I – White, Class 7

Radioactive material, Category II – Yellow, Class 7

Radioactive material, Category III – Yellow, Class 7



Radioactive material, Criticality safety index label, Class 7

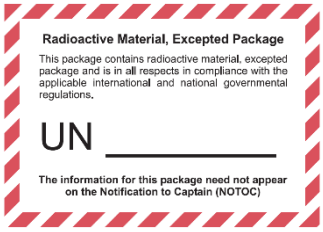


Corrosive, Class 8	Miscellaneous dangerous goods, Class 9	Miscellaneous dangerous goods - lithium batteries, Class 9

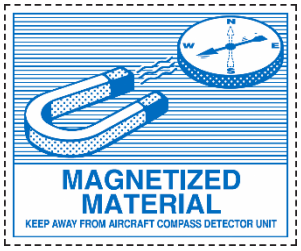
Handling Labels

Handling labels affixed to dangerous goods packages are intended to communicate handling requirements or the nature of the dangerous goods. It should be noted that not all dangerous goods packages require handling labels. Unlike hazard labels, handling labels are set in a rectangle shape. The handling labels used in the transport of dangerous goods by air and their descriptions are illustrated as follows:

Cargo aircraft only



Radioactive Material – Excepted package



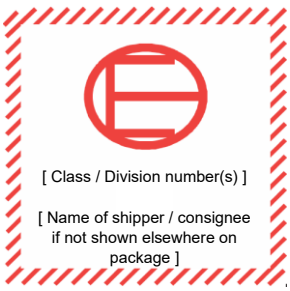
Magnetized material

Cryogenic liquid

Keep away from heat

Markings

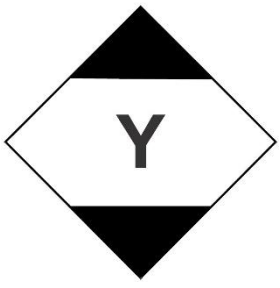
Marks on dangerous goods packages prepared for transport by air aid in identifying the shipper, consignee and the description of the dangerous goods articles or substances within the package. The various marks applicable to the transport of dangerous goods by air and their descriptions are illustrated as follows:



Excepted quantities mark

Lithium battery mark

Environmentally hazardous substance mark



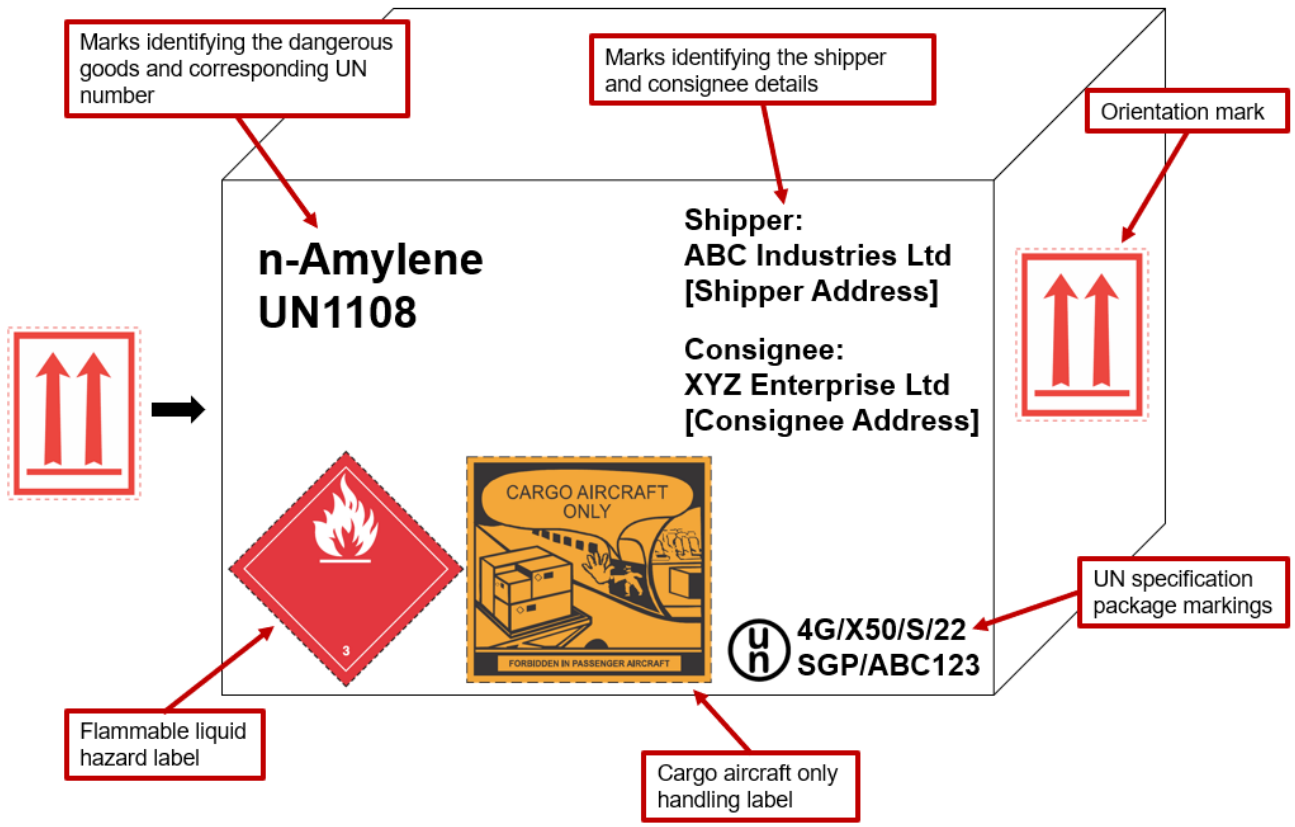
Limited quantities mark for air transport

Limited quantities mark for surface transport[2]

Biological substance, Category B mark

Genetically modified micro-organisms (GMMO) or Genetically modified organisms (GMO) mark

An example of a dangerous goods package containing a single substance prepared for transport by air on cargo aircraft only and affixed with all the relevant marks and labels is illustrated as follows:



[2] While the limited quantities mark for surface transport (sea, road and rail) is not applicable to the transport of dangerous goods by air, the presence of this mark on the outer surface of packages may also suggest that its contents are classified as dangerous goods when transported by air.

ANNEX C – GHS PICTOGRAMS AND LABELS

Globally Harmonized System of Classification and Labelling of Chemicals (GHS) is a system developed by the United Nations to standardise the classification of chemical substances and the communication of hazards in the use and supply of chemicals to users. Under this system, chemical manufacturers or suppliers are required to label receptacles containing chemicals substances with appropriate labels incorporating diamond-shaped pictograms to communicate their inherent hazards.

While GHS labels are not required for the purpose of transporting dangerous goods by air, such labels can often be found on the outer surface of packages containing chemical substances. The presence of such labels, particularly those displaying pictograms containing symbols that resemble those found on dangerous goods transport hazards labels, would indicate that its contents may likely be classified as dangerous goods when transported by air. The following table shows a list of the pictograms used in the GHS to communicate chemical hazards:

GHS Pictogram / Name	May contain any of the following Class/Division of dangerous goods	Corresponding Hazard Labels / Mark
 Explosive	**Division 1.1** - Substances and articles which have a mass explosion hazard **Division 1.2** - Substances and articles which have a projection hazard but not a mass explosion hazard **Division 1.3** - Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard **Division 1.4** - Substances and articles which present no significant hazard **Division 1.5** - Very insensitive substances which have a mass explosion hazard **Division 1.6** - Extremely insensitive articles which do not have a mass explosion hazard	

 Flammable	**Division 2.1** - Flammable gases **Class 3** - Flammable liquids **Division 4.1** - Flammable solids, self-reactive and related substances and solid desensitized explosives and polymerizing substances **Division 4.2** - Substances liable to spontaneous combustion **Division 4.3** - Substances which, in contact with water, emit flammable gases **Division 5.2** - Organic peroxides	
 Oxidizer	**Division 5.1** - Oxidizing substances	
 Gases under pressure	**Division 2.2** - Non-flammable, non-toxic gases	

 Corrosive	**Class 8** - Corrosive substances	
 Toxic	**Division 2.3** - Toxic gases **Division 6.1** - Toxic substances	 
 Aquatic Toxicity	**Class 9** - Miscellaneous dangerous substances and articles, including environmentally hazardous substances	 

 Harmful*	Not applicable	Not applicable
 Respiratory*	Not applicable	Not applicable

* GHS labels bearing harmful and respiratory pictograms are not known to contain substances meeting the criteria for classification as dangerous goods when transported by air.

ANNEX D – TRANSPORT INFORMATION IN SAFETY DATA SHEET

The Safety Data Sheet (SDS - also known as material safety data sheets or MSDS) of a chemical substance contains comprehensive information about its inherent hazards. It should be noted that SDS is only applicable to chemical substances but not articles such as equipment, devices or batteries. Notwithstanding this, some manufacturers and suppliers have also provided SDS for some articles (e.g. lithium batteries).

Arranged into 16 sections of various information, Section 14, *Transport Information*, of a SDS contains information relating to the transport of the substance or article by various modes of transport. The typical information that can be found in this section is described in the following table:

Information	Description
UN Number	A four-digit number identifying the substance or article in the *List of Dangerous Goods* of ICAO TI
UN Proper Shipping Name	The name of the substance or article corresponding to its UN number as listed in the *List of Dangerous Goods* of ICAO TI
Transport Hazard Class(es)	Dangerous goods articles or substances are classified into one of nine hazard classes. Some classes of dangerous goods are sub-divided into divisions. The list of hazard classes and divisions are as follows: **Class 1: Explosives** • Division 1.1: Substances and articles which have a mass explosion hazard • Division 1.2: Substances and articles which have a projection hazard but not a mass explosion hazard • Division 1.3: Substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard • Division 1.4: Substances and articles which present no significant hazard • Division 1.5: Very insensitive substances which have a mass explosion hazard • Division 1.6: Extremely insensitive articles which do not have a mass explosion hazard **Class 2: Gases** • Division 2.1: Flammable gases • Division 2.2: Non-flammable, non-toxic gases • Division 2.3: Toxic gases **Class 3: Flammable liquids** **Class 4: Flammable solids; substances liable to spontaneous combustion; substances which, on contact with water, emit flammable gases**

	• Division 4.1: Flammable solids, self-reactive and related substances and solid desensitized explosives and polymerizing • substances • Division 4.2: Substances liable to spontaneous combustion • Division 4.3: Substances which, in contact with water, emit flammable gases **Class 5: Oxidizing substances and organic peroxides** • Division 5.1: Oxidizing substances • Division 5.2: Organic peroxides **Class 6: Toxic and infectious substances** • Division 6.1: Toxic substances • Division 6.2: Infectious substances **Class 7: Radioactive material** **Class 8: Corrosive substances** **Class 9: Miscellaneous dangerous substances and articles, including environmentally hazardous substances** All dangerous goods will have a primary hazard. In addition to its primary hazard, some dangerous goods may also have one or more subsidiary hazards, dependent upon the nature of hazards inherent in the article or substance.
Packing Group (if applicable)	For packing purposes, some dangerous goods have been assigned to one of three packing groups based on the danger that they present: **Packing Group I**: Substances presenting high danger **Packing Group II**: Substances presenting medium danger **Packing Group III**: Substances presenting low danger
Environmental hazards	Indicates if the substance is environmentally hazardous according to UN Model Regulations or other transport regulations
Special precaution for user	Information on any special precaution that needs to be complied with in connection with transporting the substance
Transport in bulk according to IMO Instruments	Information applicable to the transport of dangerous goods in bulk according to the International Maritime Organization (IMO) Instruments only

Determine if a Substance or Article is Classified as Dangerous Goods

The following are sample extracts of information found in Section 14 of the SDS for two chemical substances.

Sample SDS Extract of a Non-Dangerous Goods Substance

The following is an extract from an SDS for the substance *Ferric Ammonium Sulfate*.

SECTION 14: TRANSPORT INFORMATION

ICAO / IATA

UN Number	None
UN Proper Shipping Name	Not Restricted / Not Regulated for Transportation
Transport Hazard Class(es)	Not Restricted / Not Regulated for Transportation
Packing Group (if applicable)	Not Restricted / Not Regulated for Transportation
Environmental hazards	Not applicable
Special precaution for user	Nil
Transport in bulk according to IMO Instruments	Nil

Based on the transport information in this SDS, the substance is not classified as dangerous goods and may be offered for transport as a general cargo consignment.

It should be noted that non-flammable, non-toxic gases may appear has as "*Not Restricted*" or "*Not Regulated*" on some SDS. However, if the gas is contained in a pressurised cylinder, it would meet the criteria for classification as dangerous goods in Division 2.2. (E.g, a pressurised fire extinguisher containing a non-flammable, non-toxic fire extinguishing agent)

Sample SDS of a Dangerous Goods Substance

The following is an extract from an SDS for the substance *Trifluoroacetic Acid*

SECTION 14: TRANSPORT INFORMATION

ICAO / IATA

UN Number	UN2699
UN Proper Shipping Name	Trifluoroacetic Acid
Transport Hazard Class(es)	Class 8 – Corrosive substances 
Packing Group (if applicable)	I
Environmental hazards	Not applicable
Special precaution for user	Warning: Corrosive substances
Transport in bulk according to IMO Instruments	Nil

Based on the transport information in this SDS, the substance is classified as dangerous goods meeting the classification criteria for Class 8 – *Corrosive substances*. It may only be offered for transported by air when a consignment containing this substance has complied with the applicable packing, marking, labelling and documentation requirements of the ICAO TI.