

Marking and labelling dangerous goods

Prior to transportation by air, articles and substances classified and identified as dangerous goods must be accurately marked and labelled with their UN or ID number and proper shipping name, with such information clearly indicated on the dangerous goods transport document and cargo packaging.

Essential Marking Requirements

Every dangerous goods package must display specific markings that identify the contents and provide critical safety information. The UN number (a four-digit identifier such as UN1203 for gasoline) and proper shipping name (the official transport name like "GASOLINE") must be clearly marked on the package in durable, legible text. Additional markings may include the shipper's name and address, consignee details, and orientation arrows for packages containing liquids. These markings serve as the primary identification system for emergency responders and handling personnel throughout the transport chain.

Hazard Labels and Their Purpose

Dangerous goods packages must display diamond-shaped hazard labels that immediately communicate the type of danger present. Each of the nine dangerous goods classes has distinctive labels with specific colours, symbols, and class numbers - for example, Class 3 flammable liquids display a red diamond with a flame symbol. Some packages may require multiple labels if the contents present more than one type of hazard. Handling labels, which are rectangular rather than diamond-shaped, provide additional instructions such as "Cargo Aircraft Only" or "Keep Away from Heat" to ensure proper handling throughout the journey.

Documentation and Consistency

The marking and labelling information on packages must exactly match the details provided in the dangerous goods transport document, creating a consistent identification system from shipper to consignee. This documentation includes the shipper's declaration, which certifies that the dangerous goods have been properly classified, packed, marked, and labelled according to regulations. Any discrepancies between package markings and transport documents can result in delays, penalties, or safety incidents, making accuracy essential for legal compliance and operational efficiency.

Quality and Durability Standards

All markings and labels must be durable enough to remain legible throughout the transport process, resistant to weather conditions, handling, and normal transport stresses. Labels must be securely attached to packages and positioned where they are clearly visible and not obscured by other markings or attachments. Poor quality or damaged markings can lead to mishandling, delays, or safety risks, emphasising the importance of using proper materials and application methods that meet international standards for dangerous goods transport.









Annex A - Dangerous Goods Marks and Labels

Below are the labels used to identify the hazard class or division of a dangerous good when transported by air and are the primary means of identifying dangerous goods by ground staff and air crew.













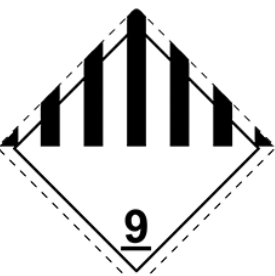

Some dangerous goods may have more than one hazardous characteristic. Each such hazard must be clearly marked and labelled on the packaging for air transportation. For some dangerous goods, ICAO Technical Instructions also require handling labels and/or other markings to be affixed.

The different types of hazard labels, markings and handling labels are illustrated below.¹




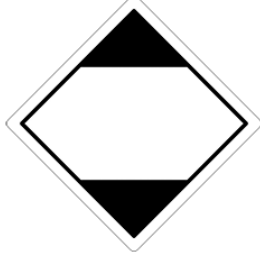
Hazard Labels

			
Explosives Division 1.1 to 1.3	Explosives Division 1.4	Explosives Division 1.5	Explosives Division 1.6
			
Flammable Gas Division 2.1	Non-Flammable, Non-Toxic gas Division 2.2	Toxic Gas Division 2.3	Flammable Liquid Class 3

¹ Source: ICAO DOC 9284 Technical Instructions for the Safe Transport of Dangerous Goods by Air

			
Flammable Solids Division 4.1	Substance Liable to Spontaneous Combustion Division 4.2	Substance which, on contact with water, emit flammable gas Division 4.3	
			
Oxidizing substances Division 5.1	Organic peroxide Division 5.2	Toxic Substances Division 6.1	Infectious substances 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 Fissile Class 7
			
Corrosive Substance Class 8	Miscellaneous Class 9	Lithium Batteries or Sodium Ion Batteries Class 9	

Markings

 <p>*Place for UN number(s)</p>			
Battery	Environmentally Hazardous Substance	Limited Quantity for Air Transport	Limited Quantity for Surface Transport

Handling Labels

			
Cargo Aircraft Only	Radioactive Material – Excepted package	Magnetized Material	
			
Cryogenic Liquid	Keep Away from Heat		

In addition to taking reference from these marks and labels, shippers and freight forwarders should check the information on the relevant Safety Data Sheet to confirm the classification and handling of such dangerous goods when transported by air.




Annex B – Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

GHS is an international system developed by the United Nations to standardise the classification of chemicals and to communicate their inherent hazards to users. Under the system, chemical manufacturers and suppliers are required to label all chemical containers or receptacles with the appropriate diamond-shaped GHS pictogram labels, based the hazards posed by the chemical substances.







Several GHS pictograms contain symbols that largely resemble those found on hazard labels used in air transportation, which suggest that the substances may be classified as dangerous goods. Other GHS pictograms communicate hazards that are only applicable to chemical users but not to transportation.

In addition to taking reference from GHS pictograms, shippers and freight forwarders should check the information on the relevant [Safety Data Sheet](#) to confirm if the substance should be classified as a dangerous good when transported by air.

The various GHS pictograms are shown below.²

Pictogram	Pictogram Name	Hazardous nature/ effects of content	May indicate that the content of the package are dangerous goods of the following class:
	Explosive	Explosives Self-reactive substances & mixtures	Class 1 - Explosives
	Gases Under Pressure	Pressurised content	Division 2.2 – Non-flammable, non-toxic gas Division 2.3 – Non-toxic gas
	Flammable	Flammable gases, aerosols/ liquid / solids Self-reactive substances & mixtures Pyrophoric liquids & solids Self-heating substances & mixtures Substances & mixtures, which in contact with water, emit flammable gas	Division 2.1 -Flammable gas Class 3 – Flammable liquid Class 4 – Flammable solid

² Source: Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Manual

Pictogram	Pictogram Name	Hazardous nature/ effects of content	May indicate that the content of the package are dangerous goods of the following class:
	Oxidizer Organic Peroxide	Oxidizing gases Oxidizing liquids Oxidizing solids Organic peroxide	Division 5.1 – Oxidizing substances
	Corrosive	Corrosive to metal Cause skin corrosion Cause serious eye damage	Class 8 - Corrosives
	Toxic	Acute toxicity, when in contact with skin, ingested or inhaled.	Class 6 – Toxic and infectious substances
	Aquatic Toxicity	Acute aquatic toxicity Chronic aquatic toxicity	Class 9 – Miscellaneous -Environmentally hazardous substances
	Harmful	Harmful when in contact with skin, ingested & inhaled Cause skin irritation Cause eye irritation Cause respiratory tract irritation Narcotic effects Cause skin sensitisation	None
	Respiratory	Cause respiratory sensitisation Carcinogenicity Reproductive toxicity Specific target organic systemic toxicity single exposure Specific target organic systemic toxicity repeated exposure Aspiration hazard Germ cell mutagenicity	Class 6 – Toxic and infectious substances

The following are some examples of GHS pictograms found on containers, receptacles or packages containing chemical substances.



Annex C - Examples of such hidden dangerous goods

Many common household and commercial products known by their general descriptions, may contain articles or substances that are classified as dangerous goods.

If undetected, such products containing hidden dangerous goods may be erroneously offered as undeclared dangerous goods for transportation by air. Some examples are as follows:

Examples of Commonly “Hidden” Dangerous Goods
<ul style="list-style-type: none">▪ Aircraft spare parts/ aircraft equipment May contain explosives (flares or other pyrotechnics), chemical oxygen generators, unserviceable tire assemblies, cylinders of compressed gas (oxygen, carbon dioxide, nitrogen or fire extinguishers), paint, adhesives, aerosols, life-saving appliances, first aid kits, fuel in equipment, wet or lithium batteries, matches, etc.
<ul style="list-style-type: none">▪ Automobiles (e.g. cars, motorcycles), automobile parts/supplies May contain ferro-magnetic materials which may not meet the definition for magnetized materials but which may require special stowage due to the possibility of affecting aircraft instruments. May also contain engines, including fuel cell engines, carburettors or fuel tanks which contain or may have contained fuel, wet or lithium batteries, compressed gases in tire inflation devices, fire extinguishers, shocks/struts with nitrogen, air bag inflators/air bag modules, flammable adhesives, paints, sealants, solvents, etc.
<ul style="list-style-type: none">▪ Battery-powered devices/ equipment May contain wet or lithium batteries.
<ul style="list-style-type: none">▪ Breathing apparatus May contain cylinders of compressed air or oxygen, chemical oxygen generators or refrigerated liquefied oxygen.
<ul style="list-style-type: none">▪ Camping equipment May contain flammable gases (butane, propane, etc.), flammable liquids (kerosene, gasoline, etc.), flammable solids (hexamine, matches, etc.) or other dangerous goods.

Examples of Commonly “Hidden” Dangerous Goods

- **Chemicals**

May contain items meeting any of the criteria for dangerous goods, particularly flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances.

- **COMAT (Company material) (e.g. aircraft parts)**

May contain dangerous goods as an integral part, e.g. chemical oxygen generators in a passenger service unit (PSU), various compressed gases such as oxygen, carbon dioxide or nitrogen, gas lighters, aerosols, fire extinguishers, flammable liquids such as fuels, paints and adhesives, corrosive materials such as batteries. May also contain other items such as flares, first aid kits, life-saving appliances, matches, magnetized material, etc.

- **Consolidated consignments (Groupages)**

May contain any of the defined classes of dangerous goods.

- **Cryogenic Liquids**

Indicate presence of refrigerated liquefied gases such as argon, helium, neon or nitrogen.

- **Cylinders**

May contain compressed or liquefied gas.

- **Dental apparatus**

May contain flammable resins or solvents, compressed or liquefied gas, mercury or radioactive material.

- **Diagnostic specimens**

May contain infectious substances.

- **Diving equipment**

May contain cylinders (such as scuba tanks, vest bottles, etc.) of compressed gas (air, oxygen, etc.), or high intensity diving lamps which can generate extremely high heat when operated in air. For such diving lamps, the bulb or battery must be disconnected for safe transportation.

- **Drilling and mining equipment**

May contain explosive(s) and/or other dangerous goods.

<ul style="list-style-type: none"> ▪ Dry shippers (Vapour shippers) May contain free liquid nitrogen. Dry shippers are not subjected to these instructions only when they do not permit the release of any free liquid nitrogen irrespective of the orientation of the packaging.
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<ul style="list-style-type: none"> ▪ Electrical equipment/ electronic equipment May contain magnetized materials or mercury in switch gear and electron tubes, wet batteries, lithium batteries or fuel cells or fuel cell cartridges that contain or have contained fuel.
<ul style="list-style-type: none"> ▪ Electrically powered apparatus (e.g. (wheelchairs, lawn mowers, golf carts, etc.) May contain wet batteries, lithium batteries, fuel cells or fuel cell cartridges that contained or have contained fuel.
<ul style="list-style-type: none"> ▪ Expeditionary equipment May contain explosives (flares), flammable liquids (gasoline), flammable gas (propane, camping gas) or other dangerous goods.
<ul style="list-style-type: none"> ▪ Film or media equipment May contain explosive pyrotechnic devices, generators, internal combustion engines, wet batteries, lithium batteries, fuel, heat producing items, etc.
<ul style="list-style-type: none"> ▪ Frozen embryos May contain refrigerated liquefied gas or dry ice (solid carbon dioxide).
<ul style="list-style-type: none"> ▪ Frozen fruits, vegetables etc. May be packed in dry ice (solid carbon dioxide).
<ul style="list-style-type: none"> ▪ Fuels May contain flammable liquids, flammable solids or flammable gases.
<ul style="list-style-type: none"> ▪ Fuel control units May contain flammable liquids.
<ul style="list-style-type: none"> ▪ Hot air balloons May contain cylinders with flammable gas, fire extinguishers, batteries, etc.

<ul style="list-style-type: none"> ▪ Household goods May contain items meeting any of the criteria for dangerous goods including flammable liquids such as solvent-based paint, adhesives, polishes, aerosols, bleach, corrosive oven or drain cleaners, ammunition, matches, etc.
<ul style="list-style-type: none"> ▪ Instruments May conceal barometers, manometers, mercury switches, reader tubes, thermometers, etc. containing mercury.
<ul style="list-style-type: none"> ▪ Laboratory/ testing equipment May contain items meeting any of the criteria be dangerous goods, particularly flammable liquids, flammable solids, oxidizers, organic peroxides, toxic or corrosive substances, lithium batteries, cylinders of compassed gas, etc.
<ul style="list-style-type: none"> ▪ Machinery parts May contain adhesives, paints, sealants, solvents, wet and lithium batteries, mercury, cylinders of compressed or liquefied gas, etc.
<ul style="list-style-type: none"> ▪ Magnets and other items of similar material May individually or cumulatively meet the definition of magnetized material.
<ul style="list-style-type: none"> ▪ Medical supplies/ equipment May contain items meeting any of the criteria for dangerous goods, particularly flammable liquids, flammable solids, oxidizers, organic peroxide, toxic or corrosive substances, or lithium batteries.
<ul style="list-style-type: none"> ▪ Metal construction material, metal fencing, metal piping May contain ferromagnetic material, which may require special stowage due to the possibility of affecting aircraft instruments.
<ul style="list-style-type: none"> ▪ Passenger baggage May contain items meeting any of the criteria for dangerous goods. Examples include fireworks, flammable household liquids, corrosive oven or drain cleaners, flammable gas or liquid lighter refills, camping stove cylinders, matches, ammunition, bleach, aerosols, etc.
<ul style="list-style-type: none"> ▪ Pharmaceuticals 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.

<ul style="list-style-type: none"> ▪ 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 or lithium batteries.
<ul style="list-style-type: none"> ▪ Racing car or motorcycle team equipment May contain engines, including fuel cell engines, carburettors of fuel tanks with fuel or residual fuel, flammable aerosols, cylinders of compressed gases, nitromethane, other fuel additives, wet batteries, lithium batteries etc.
<ul style="list-style-type: none"> ▪ Refrigerators May contain liquefied gases or an ammonia solution.
<ul style="list-style-type: none"> ▪ Repair kits May contain organic peroxides and flammable adhesives, solvent-based paints, resins, etc.
<ul style="list-style-type: none"> ▪ 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.
<ul style="list-style-type: none"> ▪ Semen May be packed with dry ice (solid carbon dioxide) or refrigerated liquefied gas.
<ul style="list-style-type: none"> ▪ Ship's spare May contain explosives (flares), cylinders of compressed gas (life rafts), paint, lithium batteries (emergency locator transmitters), etc.
<ul style="list-style-type: none"> ▪ Show, motion picture, stage and special effect equipment May contain flammable substances, explosives or other dangerous goods.
<ul style="list-style-type: none"> ▪ 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.
<ul style="list-style-type: none"> ▪ Swimming pool chemicals May contain oxidising or corrosive substances.

<ul style="list-style-type: none"> ▪ Switches in electrical equipment or instruments May contain mercury.
<ul style="list-style-type: none"> ▪ 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.
<ul style="list-style-type: none"> ▪ 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.
<ul style="list-style-type: none"> ▪ Unaccompanied passengers baggage/ personal effects May contain items meeting any of the criteria for dangerous goods, such as fireworks, flammable household liquids, corrosive oven or drain cleaners, flammable gas or liquid lighter refills, camping stove cylinders, matches, bleach, aerosols, etc.
<ul style="list-style-type: none"> ▪ Vaccines May be packed in dry ice (solid carbon dioxide).

Note:

Articles and substances which do not fall within the definition of dangerous goods, and which in the event of leakage may cause a serious clean-up problem or corrosion to aluminum on a long-term basis, must be checked by the shipper and freight forwarder.

Annex D – Sample of a Safety Data Sheet (SDS)

A typical SDS contains information divided into 16 sections.


Section 14 of the SDS - Transport Information, contains the following essential information that would identify the substance/item as a dangerous good when transported by air:

- UN number
- UN proper shipping name
- Transport hazard class
- Packing group (if applicable)
- Special precautions when transporting the substance/item

An SDS is often used to identify dangerous goods when there is no clear identification on the packaging. As such, when uncertain if certain items should be classified as dangerous goods, shippers and freight forwarders may contact the supplier/manufacturer for confirmation, or request a copy of the SDS for further information.

Shippers and freight forwarders should request a copy of the SDS from the supplier or manufacturer of the substance/item to verify if it should be classified as a dangerous good.

Sample SDS

Safety Data Sheet		
Sulphuric Acid 50%		
Document number: S/2282/SA5	Revision Date: 12 January 2021	
Section 1: Identification		
Product Identifier		
Trade name:	Sulphuric Acid 50%	
Product code:	SA5001	
Recommended use and restriction on use		
Recommended use:	Industrial purposes	
Restriction of use:	No transport, no storage, no disposal	
Details		
Section 14: Transport Information		
UN-Number	UN1830	
UN proper shipping name	Sulphuric acid	
Transport hazard class(es)	Class 8	
Packing group	II	
Environmental hazards		
Marine pollutant	No	
Special precautions for user		
Warning	Corrosive	
Hazard identification no. (Kemler code)	Xn	
EMG Number	2.1.2.2.1	
Segregation groups		
Section 15: Regulatory information		
Section 16: Other information		