Dangerous Goods

> *Articles or substances which are capable of posing a hazard to health, safety, property or the environment. (ICAO)*

Dangerous Goods, frequently referred to as "DG" for short, are commonly handled by humanitarian organisations in field settings. Unfortunately, proper handling and storage of DG items is less commonly known, and many areas of humanitarian response lack regulatory oversight or enforcement of DG rules. Humanitarian actors should attempt to learn as much about DG items under their care for the safety of their own personnel, local communities, and the environment, and should seek to enforce proper handling and storage procedures wherever DG may be present.

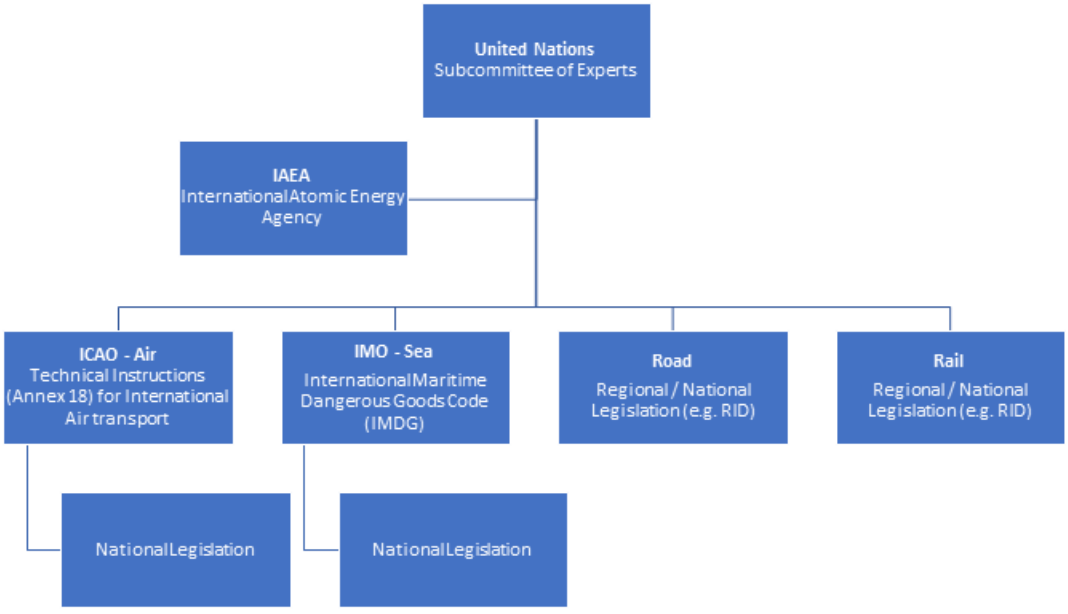
Common Terms in Dangerous Goods

DG	Short for “Dangerous Goods” – the term “DG” is used frequently in international transportation and storage.
Flash point	The lowest temperature at which flammable liquid ignited in the atmosphere when exposed to a source of ignition.
Explosive article	Any article containing one or more explosive substances.
Overpack	An enclosure used by a single shipper to contain one or more packages and to form one handling unit.
Outer Packaging	The outer protection of a composite or combination packaging together with any absorbent materials, cushioning and any other components necessary to contain and protect inner receptacles or inner packaging.
Pressurized Containers	Any container or vestibule that contains pressurised liquids or gasses of any kind. Pressurised containers can be considered dangerous goods even when evacuated and empty.
UN Dangerous Goods Identification Number	Four-digit ID number that quickly identifies the specific dangerous good and any associated handling or special transportation needs.
ICAO	Short for the United Nations “International Civil Aviation Organisation”.
IATA	Short for “International Air Transport Association.”

HazDec	Short for “Shipper’s Declaration of Dangerous Goods.” HazDecs are predefined declaration forms shippers must include when transporting DG items via air/sea.
IMO	Short for “International Maritime Organisation”
DGD	Short for “Shipper’s Dangerous Goods Declaration.” DGDs are predefined declaration forms shippers must include went transporting DG by air/sea.
HazMat	Short for “Hazardous Material,” used in reference to DG, most commonly in North America.
Reactive Substance	Any substance that may react to other specific substances nearby, especially when exposed to air, when improperly stored, or when the required storage container is compromised. Reactive substances may cause rapid energetic reactions, or slow reactions. Many reactive substances react strongly to other specific substances, such as water or other chemicals, and must be handled accordingly.

Hazardous Materials and Dangerous Goods Types

Since 1956, the United Nations Committee of Experts on the Transport of Dangerous Goods has compiled, maintained and updated what are known as *UN Recommendations on the Transport of Dangerous Goods* (UN Model Regulations Rev. 12, 2001). These official recommendations include suggested standards on categorisation, labelling, and harmonised numbering of DG items for quick reference. These official recommendations are not binding - local regulations can choose to adopt, enhance or exclude regulations - and technically only pertain to transportation. Irrespective of the voluntary or specific nature of the guidelines, many international agencies have opted to adopt these standards and nomenclatures for daily use.



As part of the *UN Recommendations on the Transport of Dangerous Goods,* the United Nations

Committee of Experts on the Transport of Dangerous Goods maintains what is called a "Dangerous Goods List," a consolidated and updated list of commonly transported DG items. The Dangerous Goods List serves as a quick reference tool for persons associated with the transport and handling of DG.

The overall types and number of DG handled by transporters and warehouse personnel can be vast. Different industries have a wide variety of material requirements, and suppliers and manufacturers tend to develop specialised expertise in specific areas of DG. Irrespective of the industry specifics, handlers of DG should have a general understanding of how to manage all potentially hazardous materials they may encounter.

Hazard Class

When it comes to handling and managing DG, there are agreed upon categories of materials/substances that are commonly used between manufacturers and logistics providers, referred to by pre-defined corresponding classes. A table of these common categories and corresponding classes and sub divisions can be seen below.

Class	Category	Label	Example
1 Explosives	1.1 Mass explosion hazard		Demolition
	1.2 Projection hazard but not a mass explosion hazard		Fireworks
	1.3 Fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard		Flares
	1.4 No significant blast hazard		Safety Devices
	1.5 Insensitive explosives with a mass explosion hazard		Blasting Agent
	1.6 Extremely insensitive articles which do not have a mass explosion hazard		Explosive Extremely Insensitive Article
2 Gases	2.1 Flammable gases		Butane, Propane
	2.2 Non-flammable, non-toxic gases		Argon, Oxygen
	2.3 Toxic gases		Insecticide, Pesticide Gas

Class	Category	Label	Example
3	Flammable Liquids		Diesel, Alcohol
4 **Other Flammable Substances**	4.1 Flammable solids, self-reactive substances and solid desensitised explosives		Sulphur, Safety Matches
	4.2 Substances liable to spontaneous combustion		White or Yellow Phosphorus
	4.3 Substances which in contact with water emit flammable gases		Lithium
5 **Oxidizing Substances and Organic Peroxides**	5.1 Oxidizing substances		Calcium Chlorate, Oxygen Generator
	5.2 Organic peroxides		Hydrogen Peroxide
6 **Toxic (Poisonous) Substances**	6.1 Toxic substances		Pesticides
	6.2 Infectious substances		Patient Specimens
7	**Radioactive Materials**		Machine components, Radioactive isotope for diagnosis or treatments

Class	Category	Label	Example
8	**Corrosives**		Acids
9	**Miscellaneous Hazardous Materials**		First aid kit, Lithium Batteries

Some hazard classes – such as radioactive materials – may be extremely rare for most humanitarian organisations – but most humanitarian response organisations will handle a variety of different DG items throughout the course of their supply chains.

Some DG items have more than one hazard class, having what is known as a "subsidiary hazard class" – the secondary (or more) set of hazards that define the DG item. As an example, an explosive substance may also be toxic, or a gas may also be corrosive. The leading primary hazard classes and subsidiary hazard classes are identifiable by referencing the substance in the Dangerous Goods List. The classification is universal across multiple modes of transport.

Such hazard classes and their respective labels provide quick and visual indication of all hazards posed by the article or substance. Direct recognition of all hazards, makes it easy to understand the risks, apply segregation (incompatibility) guidelines and ensure everyone is aware they are dealing with DG.

UN No.	Name and description	Class or division	Subsi-diary hazard	UN packing group	Special provi-sions	Limited and excepted quantities		Packagings and IBCs		Portable tanks and bulk containers	
								Packing instruction	Special packing provisions	Instruc-tions	Special provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
-	**3.1.2**	**2.0**	**2.0**	**2.0.1.3**	**3.3**	**3.4**	**3.5**	**4.1.4**	**4.1.4**	**4.2.5 / 4.3.2**	**4.2.5**
1249	METHYL PROPYL KETONE	3		II		1 L	E2	P001 IBC02		T4	TP1
1250	METHYLTRICHLOROSILANE	3	8	II		0	E0	P010		T10	TP2 TP7 TP13

UN DG Numbering System

Contained within the Dangerous Goods List is a consolidated numbering system for the rapid classification of dangerous goods. This list is sometimes referred to as the UN Dangerous Goods Identification Number, Dangerous Goods Classification Number, or Sometimes just the UN Number.

This UN number is universal across multiple modes of transport, and consists of four digits

Example:

Item Description	Calcium hypochlorite mixture, dry, corrosive with more than 10% but not more than 39% available chlorine

UN ID Number	**UN 3486**

Understanding and utilising UN DG numbers is extremely important for anyone planning on procuring, transporting and storing any substance that might be considered dangerous goods. DG numbers are extremely specific to material or chemical composition, and referencing a DG number across the Dangerous Goods List will quickly inform handlers of labelling requirements, packing instructions and limits for different forms of transport, hazard class, special handling needs, and if there are potential secondary hazards such as reacting to other substances.

To enhance the safe handling and transport of goods, users must correctly and accurately identify the UN Number. UN Numbers can be found on the Dangerous Goods List in the first column next to the corresponding DG item. The UN DG number is extremely specific, and many DG items with similar sounding names might have different ID numbers. When determining the ID number, users must use the accurate, full name of the DG item, and may even need to denote the percentages of its chemical composition or even the size of its packaging.

UN No.	Name and description	Class or division	Subsi-diary hazard	UN packing group	Special provi-sions	Limited and excepted quantities		Packagings and IBCs		Portable tanks and bulk containers	
								Packing instruction	Special packing provisions	Instruc-tions	Special provisions
(1)	(2)	(3)	(4)	(5)	(6)	(7a)	(7b)	(8)	(9)	(10)	(11)
-	3.1.2	2.0	2.0	2.0.1.3	3.3	3.4	3.5	4.1.4	4.1.4	4.2.5 / 4.3.2	4.2.5
1817	PYROSULPHURYL CHLORIDE	8		II		1 L	E2	P001 IBC02		T8	TP2
1818	SILICON TETRACHLORIDE	8		II		0	E0	P010		T10	TP2 TP7

Transporters will rely on this information for the process of properly securing and handling loads, especially air transporters who may be adversely impacted by DG items. If the UN DG Number is unknown, or isn't readily available, persons involved with the transportation or storage of DG items should not make up a number nor search in the inappropriate places. Wherever possible, logistics personnel should consult with manufactures, properly certified persons, or transport providers to properly identify the correct numbers.

Marking and Labelling

In the context of DG handling, labelling refers to the proper placement of pre-defined labels on the carton, canister, or other form of packaging or overpacking that dangerous good or hazardous items are stored and transported in. The labelling of DG is absolutely essential for air transport, however DG container should be labelled at all points throughout the supply chain, including warehousing and all other forms of transportation.

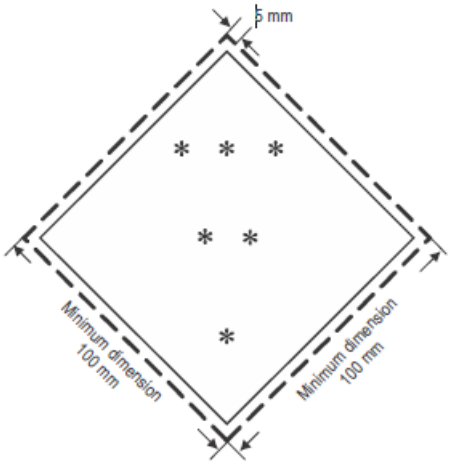
- Any person or organisation shipping or handling dangerous goods for any reason should be able to clearly identify DG using the appropriate labelling.
- The hazardous material contained within the packaging defines the labelling required.
- Labelling should be easy to read and clearly visible on the outermost outer packing or overpacking, and should be affixed on the side/top of the carton, ideally near the shipping

label.

- Mixed or consolidated packages of more than one type of hazardous material must contain proper labelling for each type of dangerous goods. NEVER mix or consolidate hazardous materials into a single package that might react with each other in any way.
- For storage: If at all possible, cartons containing DG should be stored in a manner that makes them easy to access and identify, meaning that the labels should remain visible at all times.
- For transport: If DG containers are palletised, pallets containing DG items should also be clearly labelled on the outside of the pallet wrapping or binding.
- For transport: Each label type must meet the size and colour requirements defined by ICAO and IATA, IMO, or other regulatory body relevant to the mode of transportation.

UN Number – Cartons or containers used for transporting DG items should clearly indicate the correct corresponding UN number.

Hazard Class Labelling – Containers of DG of any kind should he clearly labelled with the corresponding hazard class label. Hazard class labels should not be smaller than 10 cm along the edge. If a container has more than one DG hazard class, each hazard class must be indicated on the outside. Containers with DG that have one or more subsidiary hazard class must also be clearly labelled each subsidiary hazard class on the outside. The colour and symbol of the hazard label, indicates the type of hazard (e.g. red for fire, skull and bones for toxic).



Example Hazard Class Labels:

Handling Labels – Handling labels should be used in conjunction with hazard class labels, but provide specific information specific to the DG that cannot be ascertained from the hazard class alone. This might include package orientation, special handling needs, or special considerations.

Example Handling Labels:

Note: the example labels serve as a guide only. Hazard labels have variations to express even more information, and there are even a wider set of handling labels. Both label types are routinely reviewed and updated by international regulatory bodies. For the most up to date set of labels, please coordinate with a properly certified person or transporter.

Example Carton with DG Marking

Placarding

A placard is a physical sign that denotes a large physical structure that either contains or transports one or more containers of DG items. Physical structures might include:

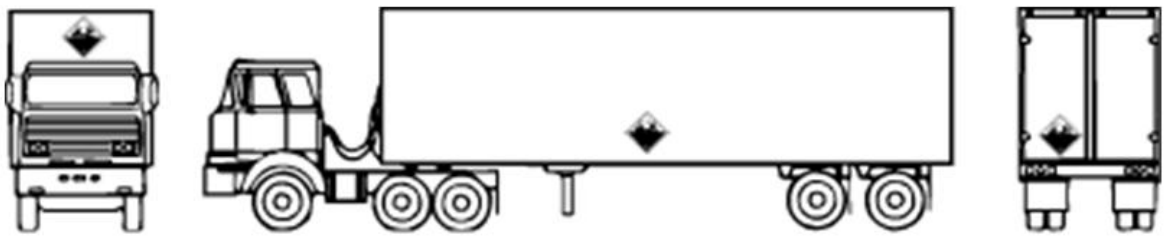
- Bulk packaging.
- Freight/Cargo container.
- Unit load device (ULD).
- Truck, rail car, or other surface vehicle transporting DG.
- Warehouse (area).

A placard functions much like a sticker label – it denotes the hazard class and specific attributes of the DG contained within vehicle or structure.

The use of placards is not universally regulated nor is it universally enforced, especially as it pertains to use inside of individual countries of operation. Many countries heavily regulate the use of placards on locations that store DG items, or on vehicles that transport DG items, while other countries have limited to no regulation, especially in humanitarian contexts. Persons or organisations operating in any country should understand local regulations surrounding placard usage, and should utilise the appropriate placard where available.

Vehicles or multi-modal containers that may cross international boundaries may be required by one or both countries to properly place placards on vehicles or containers. Shipping containers that contain DG that frequently are transhipped between various ports are usually required to have some form of placarding, commensurate with port and private regulations.

In contexts where placard use is not regulated or enforced, humanitarian agencies should endeavour to still place placards where safe and appropriate. There is no one accepted guidance on placard usage, but as a general rule, any time the cumulative aggregate weight of DG on any one vehicle exceeds 500 kg, then vehicles should be properly marked. Additionally, long term storage locations containing DG should also be clearly placarded.



Title
Download - DG Hazard Labels
File

Common Issues with Storage and Transport of Dangerous Goods

Any Form of Multi-Modal Transport

Irrespective of form of transport, there are certain DG considerations all shippers including humanitarian agencies should be aware of.

Differing Standards

Though there is wide consensus on how to handle and process DG cargo, not all standards across all modes of transport are the same. The overall size or type of packaging for a DG item may vary depending on the mode of transport. As an example, a container of Calcium Hypochlorite (HTH) might be allowable up to 20 kg per container for a seaborne vessel while only allowed up to 5 kg for an airborne vessel. Additionally, there are different declaration and labelling standards for different modes of transport. Humanitarian supply chain planners should think through their entire supply chain needs when deciding what DG to procure and how to properly package and label it, taking multiple modes of transport into account.

Responsibility

The legal requirements for compliance with DG regulations vary greatly across operational contexts – commercial aviation will have strict regulations while field level operations may have no discernible regulations at all. This variation may cause problems throughout a supply chain – persons ordering or packing cargo at one end of the supply chain may not understand the requirements for another part. Humanitarian actors must still know what DG items they intend to handle, and know how to handle them. As DG items are stored and transported they will need to be properly labelled, packaged, identified on packing lists/manifests and have the appropriate accompanying declaration documentation. In highly regulated contexts, any failure to identify or properly classify a DG item can result in fines, cargo being rejected or impounded, or contractual penalties. Serious incidents resulting from mislabelled or misidentified DC can result in series legal penalties or jail time. In any context, incorrectly packed or handled dangerous goods can have on operations safety, in worst case scenario a spill, fire can result from incorrect shipment preparation or handling, with dramatic consequences for people and assets.

Certification in DG Handling/Shipping

Private industries – such as international aviation and maritime associations – and some national or local regulatory bodies rely on specially trained persons or third-party experts to properly identify and manage the labelling, handling and transport requirements for DG. A properly DG certified person will have undergone specific training from relevant accredited bodies, and may have to undergo re-certification every year. The different levels and types of certification relate to the nature of the DG activity (air, sea, road, etc) and to the overarching bodies that govern the type of activity. Where possible, humanitarian agencies should work with accredited transport companies, forwarders, and local government authorities. Regulations in many parts of the world require certified persons to prepare and inspect DG items before they can even be loaded onto a vessel in the first place.

As an example, DG shipped using international commercial air transport must be managed by a person certified through an IATA recognised DG training program; the properly IATA DG certified person is ultimately responsible for signing all DG related declarations. Any person who is not certified to manage air transport of DG should not be certifying DG cargo, and failure to comply can result in accidents and penalties. Different regulatory bodies may require different forms of certification, and national and local laws may require DG certification for warehousing, sea and road transport supervision as well.

Humanitarian agencies may not have the capacity to employ full time personnel with all required certifications, but third-party logistics companies often can and do have properly certified persons on call who will work with agencies to properly document and certify DG cargo. To facilitate this process, humanitarian agencies may seek as much information on DG

related products as possible. Manufacturers and vendors in more developed industries can supply DG related information, including:

- Special temperature or handling requirements.
- Local and international regulations.
- Specifications on packaging requirements for shipping.

Safety Data Sheets

Many suppliers should be able to provide what is known as a Safety Data Sheet (SDS) / Material Safety Data Sheet (MSDS) / Product Safety Data Sheet (PSDS) – product specification sheets that can inform commercial handlers and transporters of any DG related properties to assist the transport process. Many transporters – especially air transporters – will ask for SDS/MSDS/PSDS to be submitted along with other documentation.

SAFETY DATA SHEET

SECTION 1: IDENTIFICATION

1.1 Product Identifier

Product Form: Substance

Product Name: Natural Gas

Synonyms: Methane

1.2 Intended Use of the Product

Fuel gas - domestic, commercial and industrial

Note: this Safety Data Sheet does not include information related to Liquified Natural Gas.

1.3 Supplier Information

Supplier Name
Address
Country
Phone Number

1.4 Emergency Telephone Number

Emergency Number : 1-877-969-0999

SECTION 2: HAZARD IDENTIFICATION

2.1 Classification of the Substance or Mixture

Simple Asphyxiant	Simple Asphyxiants – Category 1; A gas that is a simple asphyxiant.
Gases Under Pressure	Gases under pressure / Compressed gas
Flam Gas 1	Flammable gases - Category 1
H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated

2.2 Label Elements

Hazard Pictograms :

Signal Word : Danger

Hazard Statements : H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.
H380 - May displace oxygen and cause rapid suffocation.

Precautionary Statements : P210 - Keep away from heat, sparks, open flames, hot surfaces. No smoking.
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.
P403 - Store in a well-ventilated place.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.

2.3 Other Hazards

Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Asphyxiant gas, can be fatal. May cause damage to the blood, central nervous system, and cardiovascular system. High concentrations of gas can cause unconciousness and death. Mercaptan is added (rotten egg odour) to the gas, however this smell should not be relied on as a good indicator of the presence of gas as olfactory fatigue (loss of smell) occurs rapidly. Being under the influence of alcohol may enhance the effects of this product.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Name	Product Identifier	% (w/w)	GHS / WHMIS Classification
Natural gas (predominantly methane)	(CAS No) 8006-14-2	100	Simple Asphyxiant Flam. Gas 1, H220 Compressed gas, H280

Air Transport of Dangerous Goods

Out of all methods of cargo transport, air transport is by far the most sensitive to proper DG packaging, labelling and handling. Operating and maintaining an aircraft at altitude is already a dangerous task, and small problems that might arise from any DG item being mishandled can be amplified to catastrophic proportions very quickly.

- The air inside aircraft is rapidly recirculated, and any potentially hazardous fumes or smoke can harm crew members quickly.
- Fires spread quickly inside aircraft, and crews have limited space and reaction times.

- Energetic explosive events, or projectile objects can harm essential crew or depressurise a cabin causing serious or fatal accidents.

The majority of commercially operated aircraft take guidance from both the International Air Transport Association (IATA) and the International Civil Aviation Organisation (ICAO)

IATA - IATA is an international consortium of governments and private sector operators that helps define mutually recognised regulations and standards for international transportation of goods and persons, including regulations relating to the transportation of dangerous goods. Many national civil aviation authorities follow IATA guidelines, and virtually all international air operators and international airports follow IATA standards.

ICAO - ICAO is a specialised UN agency that supports the development of mutually recognised civil aviation standards among UN member states, including air safety regulations.

ICAO and IATA collaborate closely on the development and provision of DG regulations which are considered industry standards. IATA publishes the "Dangerous Goods Regulations" (DGR) while ICAO publishes "Technical Instructions for the Safe Transport of Dangerous Goods by Air," both of which are updated on an ongoing basis. These regulations don't just designate labelling and handling, but also denote quantity limitations, specialised packaging requirements for air transport, what cargo may not travel on passenger aircraft, and restrict some DG items altogether.

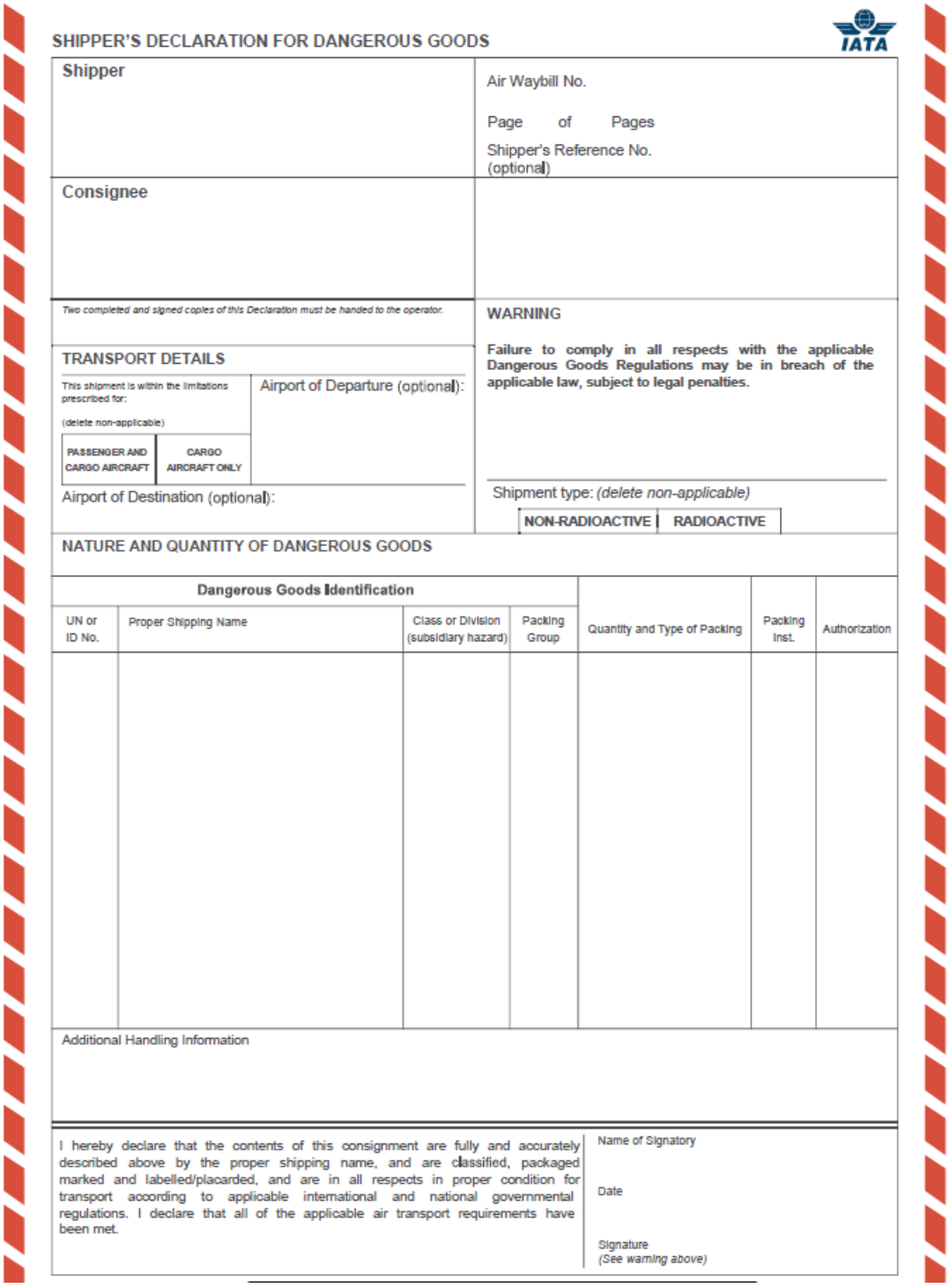
Virtually all commercial and private flights that operate internationally must comply with IATA and ICAO standards, including those standards relating to DG. Commercial shippers, manufacturers, suppliers, airports and ground handling companies should understand these regulations, and have a shared common understanding of how DG should be transported by air. Aircraft that operate in domestic airspace and do not cross an international border are beholden to that country's civil aviation authority (CAA). Domestic CAAs have the autonomy to operate and regulate aviation activity within their own airspace as they see fit, however most CAAs align their standards closely with both ICAO and IATA. Furthermore, a common adoption of international DG standards makes it easier for pilots and crew to operate multiple countries when required.

DG transported by air will be highly scrutinised by airports, CAA authorities, aircraft operators, crew and insurance companies. The ultimate determining factor of what can or cannot be loaded onto an aircraft is the loadmaster, crew and pilot, who will follow local and international standards, and assess what they feel as safe. Loaders will still expect DG cargo to be properly packaged and declared, that SDS/MSDS/PSDS are provided and DG marked on packing lists, and that persons or organisations who plan to ship DG items by air should identify and work with companies and logistics providers who are fully certified and authorised to manage, label and handle DG items.

Shipper's Declaration for Dangerous Goods

The "Shippers Declaration of Hazardous Goods" (abbreviated as DGD and also known as Hazardous Declaration or HazDec) is a standard, industry wide accepted form for properly declaring dangerous goods as they are loaded onto an aircraft. DGDs should be submitted with regular paperwork – such as a packing list – as well as being stored alongside the DG cargo itself. Air operators, airports, ground handling crews and insurance underwriters rely on DGDs to quickly identify all potential hazards and understand how to assess incoming consignments. Consequently, the person filling out and signing a DGD should be properly certified by an ICAO or IATA accredited certification program in DG. Many air operators in developed contexts will only accept DGDs from certified persons. Falsely declared or improper certification on a DGDs

can lead to serious penalties.



SHIPPER'S DECLARATION FOR DANGEROUS GOODS

IATA

Shipper	Air Waybill No. Page of Pages Shipper's Reference No. (optional)
Consignee	
Two completed and signed copies of this Declaration must be handed to the operator.	WARNING **Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.**
TRANSPORT DETAILS This shipment is within the limitations prescribed for: (delete non-applicable) PASSENGER AND CARGO AIRCRAFT / CARGO AIRCRAFT ONLY Airport of Departure (optional): Airport of Destination (optional):	Shipment type: *(delete non-applicable)* NON-RADIOACTIVE / RADIOACTIVE

NATURE AND QUANTITY OF DANGEROUS GOODS

Dangerous Goods Identification						
UN or ID No.	Proper Shipping Name	Class or Division (subsidiary hazard)	Packing Group	Quantity and Type of Packing	Packing Inst.	Authorization

Additional Handling Information

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I declare that all of the applicable air transport requirements have been met.

Name of Signatory

Date

Signature
(See warning above)

Sea Transport of Dangerous Goods

Sea transport also some specific sensitivities pertaining to the transport of DG. Though not as strict as aviation, seaborne cargo comes with its own special restrictions and considerations, as well as its own handling needs. Additionally, the majority of seaborne cargo by nature moves between different ports in different countries, necessitating a strong common international standard.

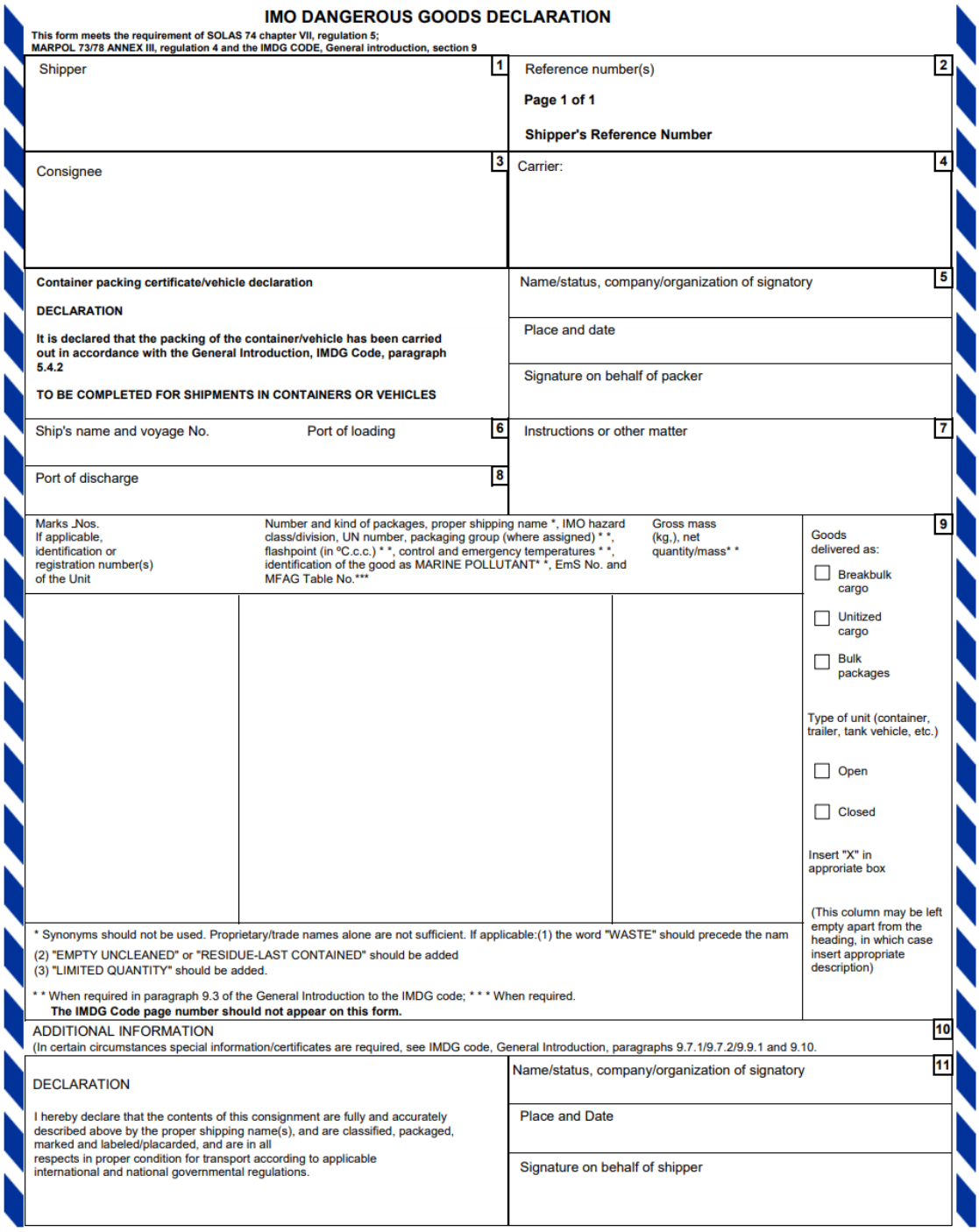
- DG transported in ocean containers can be stored for months a time, and be exposed to a wide range of temperatures.
- Shipping containers can be transhipped through multiple ports globally, and may be stored in the vicinity of a wide range of other DG or heavy machinery.
- The quantities of DG that may be stored on a single vessel may be substantial, and can result in large explosive, toxic, or other hazardous accidents. Crews stranded on vessels at sea may be days away from a rescue, and their health and safety may be heavily compromised.

As it pertains to DG, seaborne vessels take their guidance from the International Maritime Organisation (IMO). The IMO is a United Nations specialised agency with responsibility for the safety and security of shipping and the prevention of marine and atmospheric pollution by ships. The IMO produces what is called the International Maritime Dangerous Goods (IMDG) Code. The IMDG Code specifically outlines the storage, handling, labelling and placarding of DG cargo on vessels. IMDG is also update on an ongoing basis.

The vast majority of sea cargo utilised by humanitarian agencies will be transported using multi-modal shipping containers, or perhaps large oversized cargo such as vehicles. It is unlikely that humanitarian agencies will be responsible for sealing their own containers or be present for vessel loading; to ensure DG is properly handled they must work with a knowledgeable and certified person or company who can advise on the proper packing and labelling of cargo, and who will be responsible for ensuring containers contain the appropriate placards. Humanitarian agencies shipping goods will still be expected to provide as much information as possible, including identifying UN DG Identification Numbers, specifying DG on packing lists, SDS/MSDS/PSDS and supplying supporting documentation.

Dangerous Goods Declaration (DGD)

The IMO “Dangerous Goods Declaration” (DGD) is a standard, industry wide accepted form for properly declaring dangerous goods as they are loaded onto a seaborne vessel. DGDs should be submitted with regular paperwork – such as a packing list – as well as being stored alongside the DG cargo itself. DGDs may not be the only dangerous goods declaration forms used by transporters – some shipping lines maintain their own DG declaration standards, especially if they operate using domestic inland waterways. Irrespective of the form used, DGDs must be filled out and signed by someone who is fully authorised and certified to do so.



IMO DANGEROUS GOODS DECLARATION

This form meets the requirement of SOLAS 74 chapter VII, regulation 5;
MARPOL 73/78 ANNEX III, regulation 4 and the IMDG CODE, General introduction, section 9

1 Shipper	2 Reference number(s) **Page 1 of 1** **Shipper's Reference Number**
3 Consignee	4 Carrier:
Container packing certificate/vehicle declaration **DECLARATION** **It is declared that the packing of the container/vehicle has been carried out in accordance with the General Introduction, IMDG Code, paragraph 5.4.2** **TO BE COMPLETED FOR SHIPMENTS IN CONTAINERS OR VEHICLES**	5 Name/status, company/organization of signatory Place and date Signature on behalf of packer
Ship's name and voyage No. Port of loading 6	7 Instructions or other matter
8 Port of discharge	

Marks ,Nos. If applicable, identification or registration number(s) of the Unit	Number and kind of packages, proper shipping name *, IMO hazard class/division, UN number, packaging group (where assigned) * *, flashpoint (in °C.c.c.) * *, control and emergency temperatures * *, identification of the good as MARINE POLLUTANT* *, EmS No. and MFAG Table No.***	Gross mass (kg,), net quantity/mass* *	9 Goods delivered as: ☐ Breakbulk cargo ☐ Unitized cargo ☐ Bulk packages Type of unit (container, trailer, tank vehicle, etc.) ☐ Open ☐ Closed Insert "X" in approriate box (This column may be left empty apart from the heading, in which case insert appropriate description)

* Synonyms should not be used. Proprietary/trade names alone are not sufficient. If applicable:(1) the word "WASTE" should precede the nam
(2) "EMPTY UNCLEANED" or "RESIDUE-LAST CONTAINED" should be added
(3) "LIMITED QUANTITY" should be added.

* * When required in paragraph 9.3 of the General Introduction to the IMDG code; * * * When required.
The IMDG Code page number should not appear on this form.

10 ADDITIONAL INFORMATION
(In certain circumstances special information/certificates are required, see IMDG code, General Introduction, paragraphs 9.7.1/9.7.2/9.9.1 and 9.10.

DECLARATION I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name(s), and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.	11 Name/status, company/organization of signatory Place and Date Signature on behalf of shipper

Road Transport of Dangerous Goods

There is no globally recognised standard for the proper method for the surface transport of DG items. National and local regulations vary greatly, and the contexts in which humanitarian organisations may respond might have virtually no regulation whatsoever. Humanitarian organisations should endeavour to maintain minimum safety standards for road transport of DG, and remain in compliance with any regulations that may pertain to the geographic areas of response.

Packaging, Labelling and Identification – to whatever extent possible, DG items transported by road should have proper labels on cartons/containers, and be fully disclosed on shipping documents such as packing lists and waybills. As a rule of thumb, DG labelling and packing should be at least equal to the requirements for sea shipping, however local regulations may strictly indicate these requirements as well. Packaging should not be compromised, and transporters – especially third party transporters – should be made well aware of the contents of their vehicles.

Placards and Vehicle Requirements

Many national and local regulations strictly regulate the placement of placards on surface vehicles that transport DG. These regulations relate not only to the placement of markings, but also to the types/volumes/quantities of DG items, times of day and locations of operation, and even may require special training from drivers or special ratings for vehicles. Humanitarian agencies planning to operate in any context should research and understand these regulations where required. Failure to do so can mean required volumes of items not being able to be delivered, transhipped, or not being able to be transported by regular means altogether.

Self-Loaded/Self-Operated Vehicles

Humanitarian agencies may own or operate their own vehicles, or may take a full responsibility in loading, securing and even driving vehicles laden with DG. Even without official regulation, there are several steps agencies should follow:

- Avoid loading multiple types of DG that may react with each other onto a single vehicle.
- Properly secure DG items that may fall over or spill.
- Never transport DG items long side other items that may cause rapid or violent reactions.
- Avoid overloading any one vehicle with DG – spread DG deliveries out over a long period of time.
- Where large loads of DG items are unavoidable (example: fuel trucks), understand the local context – move the vehicle when is safest time of day and along the safest route.
- Instruct staff and drivers on proper transport and handling methods.
- Transport compressed containers empty were possible, and discharge batteries.
- Where required, place signs in local languages indicating:
    - Warnings when a truck may have flammable or hazardous substances.
    - If people should avoid smoking around the vehicle.
    - If special handling requirements for the DG items exist.

Warehousing and Storage of Dangerous Goods

The proper storage and warehousing procedures for DG items – while extremely important – do not have a well-defined international standard like transportation of DG does. This largely stems from the fact warehouses themselves will almost never operate between two different sovereign territories. As a result, the proper storage of DG in a warehousing context is often regulated by national and local authorities; sometimes regulation is heavy, and sometimes regulation is almost non-existent.

Humanitarian organisations operating in any context should both understand the proper methods of storing DG, and should maintain and enforce internal policies. Additionally, any agency specific warehousing DG procedures should also comply with the prevailing national or local laws regarding DG management.

Identify DG/Hazardous Items

While in the course of humanitarian operations, persons working in storage or warehousing should always be alert for incoming DG/Hazardous Items. Simple steps to follow for identifying potentially hazardous materials include:

- Check labels on containers for clues such as, caution label, warning label, danger label. These are usually the indication if something is hazardous.
- Check for SDS/MSDS/PSDS for incoming shipments.
- Identify the material on the UN list of dangerous goods.

Basic DG and Hazardous Materials Handling Requirements

When storing any DG or hazardous materials for any reason and in any context, the following is recommended:

- Identify DG/hazardous materials beforehand and transport, handle, and store them in accordance with local regulations.
- Keep SDS/MSDS/PSDS in the same storage location as the stored DG/hazardous items.
- Learn and know the risk of DG/hazardous items in storage.
- If necessary, keep a separate DG/hazardous inventory.
- Separate and properly track DG/hazardous item waste.
- Keep adequate spill response equipment available and train employees on their use.
- Use the rule of “first in first out” (FIFO), use the oldest product first.
- If the expiration date marked on the side of the product has been exceeded, contact the proper authority to see if the expiration date has been or can be exceeded.

Spill Prevention

Steps that any person managing DG/hazardous materials can take to reduce or prevent spills might include:

- Understand chemical hazards.
- Follow safe storage and handling procedures.
- Read and follow the instructions on labels and material safety data sheets.
- Don’t store or use chemicals in unlabelled containers.
- Inspect chemical containers for damage or leaks.
- Don’t handle or open chemical containers without appropriate personnel protective equipment (PPE).
- Don’t leave containers open.
- Report potential hazards to managers, other employees, and safety managers.

It is recommended that damaged or leaking hazardous materials should be removed and stored in a separate, safe space. Ideally, spilled items should be stored in a well-marked, reinforced plastic drum.

Spill Response

In the event of a spill or leaking container, the supervisor of the facility should be notified. The person discovering the spill and the site supervisor should record information on the spill (when it occurred, why it occurred, what was spilled, volume spilled, personnel involved, etc,), and keep on file at the storage location.

Necessary action to contain and control the spill by soaking up, diverting, or containing any

liquid flow should be taken immediately to prevent contamination of any surface drains, soils, or waterways. Such action could include spreading absorbent materials or pads and/or using absorbent rolls or dirt to control the flow.

Spill Clean-up

Materials used to support the clean-up DG/hazardous materials spills should be readily available in all storage locations where DG/hazardous materials might be stored. These materials might include items such as the following:

- Oil absorbent pads.
- Brooms and squeegees.
- Large plastic covered trash bins.
- Nitrile gloves and latex gloves.
- Leather gloves.
- Boots.
- Respiratory masks.
- Salvage drums and containment pallets.
- Dust pans or shovels.
- Sandbags or bags of other absorbent materials.
- Danger tape.
- Safety cones.
- Helmet/ “hard hat”.
- Face shield.
- Chemical resistant aprons.
- Emergency response guidelines.

In the event of spills of flammable or combustible liquids, the following steps are strongly suggested:

Inform all persons in the immediate area to evacuate, except those involved in the clean-up process.

- Notify the safety and security focal point.
- Eliminate all ignition sources, including static electricity, electrical switches, running motors, and exposed wiring.
- Increase ventilation and exhaust fumes to the outdoors.
- Put on the protective equipment.
- Confine the spill by blocking it. This is done by using the absorbent material in the spill kit. Prevent the spill from entering drains or sewer system.
- Cover the spill with absorbent materials and safely and properly dispose of used absorbents.
- Safely dispose of contaminated equipment including personal protective equipment.
- Seal and label all containers of disposed items as hazardous waste.
- Store waste in a safe spot in or near the storage facility, ideally outside, until pickup by a licensed hazardous waste disposal company can be arranged.
- For a major spill, or one that cannot be contained, the area and the warehouse should be fully evacuated.

Other Considerations

The scope and specifics of DG handling requirements depend on the activities of the agency in question, including the types of intervention activities and the sheer volume of DG items

required.

DG in warehouses should always be marked and accounted for. Cartons should always have the appropriate markings, and where necessary DG items might even require signs or marking denoting their location inside the warehouse or storage facility. Depending on the local regulations, warehouses with sufficient quantities of DG may be required to be properly marked or placarded on the outside.

All DG items should be clearly visible and clearly accessible. DG items that give off fumes, are considered combustible, corrosive, oxidising or toxic should be properly sealed and properly ventilated. DG items in containers that display distress or compromise must be removed, repacked, or secured in the appropriate manner. If at all avoidable, DG items of different types should not be stored next to each other in a warehouse, and ideally should be stored in separate structures.

Warehouse staff should be informed of which items are DG, and be instructed on the proper hazards and handling procedures associated with them. Humanitarian agencies should never expect casual or local labour to understand or respect the concerns surrounding DG, and safety should be of paramount concern.

Toxic or Corrosive Compounds – Compounds considered poisonous or toxic to humans can range across many DG items. Toxic substances should be well sealed and well-marked. If required, they should be stored in a separate location, and only handled using the appropriate protective gear. Items like refillable lead acid batteries may appear inert, but can cause harm to warehouse workers.

Explosive Compounds – While relatively unusual for humanitarian response, agencies can and do handle explosive compounds without realising it. As an example, chemical based fertilisers can be extremely explosive when intermixed with other substances. Explosive compounds should be clearly identified and segregated from the remaining cargo items. If possible, explosive compound should be stored in an entirely separate storage area, ideally someplace not commonly accessed by persons. Explosive compounds should not be exposed to excessive heat, open flames, or other reactive compounds for any period of time.

Oxidising Compounds – Corrosive compounds that may be common in humanitarian response included medical grade cleaning compounds or household cleaning supplies.
Oxidising compounds react with metals nearby, and can cause violent reactions with fuels and other combustible materials. Though warehouses may take steps to prevent violent reactions with combustible compounds, warehouse workers may not notice the slowly forming impact of oxidisation on other things in the warehouse. Oxidising compounds will slowly degrade shelving, racks, and warehouse super structures increasing risk of serious injury to warehouse workers, as well as impacting any metal objects stored near it. Storage facilities that keep oxidising compounds may end up damaging the objects immediately around the substance over a long period of time without noticing it.

Bio-hazards – Bio-hazardous substances such as medical waste or live biological samples should be handled by trained personnel only! Bio-hazardous materials should be properly sealed, and stored in separate secure areas, and at the required temperatures if any exist.

Pressurised Containers – It is strongly advised that pressurised containers of any size are not stored in a warehouse for any period of time. Flammable compressed gas should be handled in a separate storage area all together, while non-flammable compressed gas should ideally be stored temporarily, or not at all. If compressed gas or other pressured containers must be stored for any period of time, they should be stored at the ground level and properly braced to

avoid falling or rupturing. If pressurised containers have valves or nozzles that are exposed, they should be safely and securely covered to avoid rupturing or becoming damaged in movement. Pressurised containers should not be exposed to excessive heat above the normal room temperature range – even inert or non-flammable compressed compounds can violently rupture harming nearby persons.

Fuel – Fuel products are extremely common in field bases humanitarian response, including:

- Diesel
- Gasoline/Petrol
- Compressed Gas

Stored fuel is usually accessed frequently, and is equally frequently exposed to the open air. General tips for storage of fuel include:

- Fuel should be stored in an independent, secure storage facility separated from any main warehouse structure by at least 10 meters (preferably more).
- Fuel storage areas should be extremely well ventilated, while still be locked or inaccessible by unauthorised persons.
- Fuel storage areas should be properly marked with the appropriate placard.
- Fuel storage areas should have fully charged and maintained fire extinguishers easily accessible, and of the appropriate type (Class B for flammable liquids, Class C for flammable gasses).
- Fuel containers should be sealed, not exposed to air when not in use or being accessed, and not be compromised or leaking in any way.

Fuel by nature is both highly combustible, and highly reactive. Fuel should not come into contact with or be stored near any other volatile or reactive chemicals, such as nitrogen-based fertilisers or chlorine based compounds. Natural gas contained in compressed cylinders should be properly secured to avoid falling or damage.

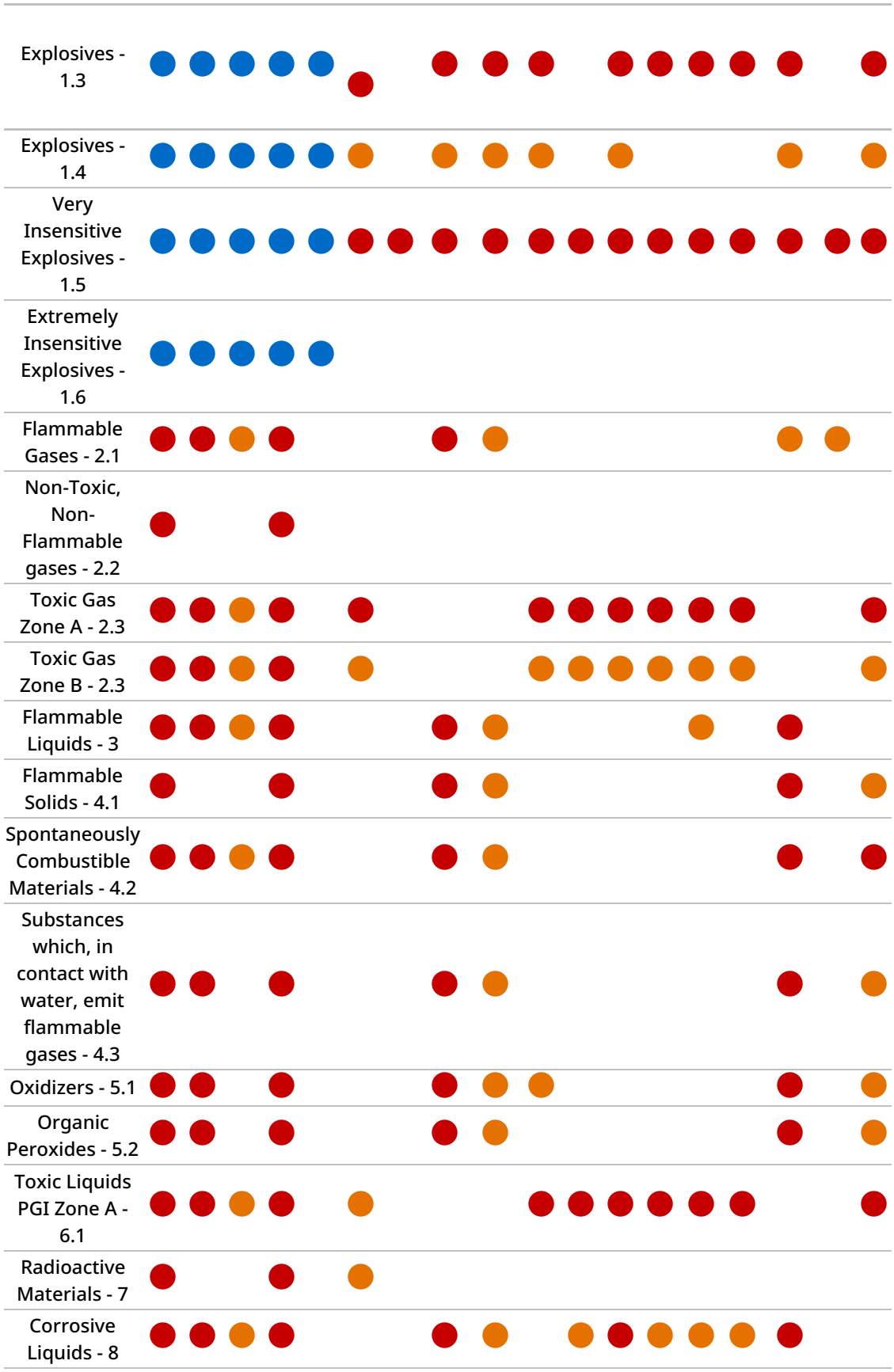
Additionally, fuel should not be exposed to open flames, sparks or excessive heat sources, including any form of welding or electrical work nearby. Employees should refrain from smoking near the area, and no smoking signs should be clearly visible. Different fuel compounds have different flash points – the temperature at which they are combustible. Note that gasoline (petrol) has a significantly lower flash point, meaning it can be ignited in negative temperatures. Other compounds vary based on things such as air temperature and ventilation.

Please reference the Fuel Management section of this guide for more information on proper fuel handling in storage and transport.

Separating DG in Transport and Storage

Understanding how to segregate DG items in storage or in transit is important. Knowing what and how to segregate is easier to track at the level of the hazard class instead of individual items. Please see the below table for a breakdown of segregation guidelines.

Class or Division	1.1, 1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3 Zone A	2.3 Zone B	3	4.1	4.2	4.3	5.1	5.2	6.1 Zone A	7	8
Explosives - 1.1 and 1.2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●


Explosives - 1.3
Explosives - 1.4
Very Insensitive Explosives - 1.5
Extremely Insensitive Explosives - 1.6
Flammable Gases - 2.1
Non-Toxic, Non-Flammable gases - 2.2
Toxic Gas Zone A - 2.3
Toxic Gas Zone B - 2.3
Flammable Liquids - 3
Flammable Solids - 4.1
Spontaneously Combustible Materials - 4.2
Substances which, in contact with water, emit flammable gases - 4.3
Oxidizers - 5.1
Organic Peroxides - 5.2
Toxic Liquids PGI Zone A - 6.1
Radioactive Materials - 7
Corrosive Liquids - 8

●	May not be loaded, transported, or stored together in the same transport vehicle or storage facility. Both main hazard risks and subsidiary risks need to be taken into account.
●	May not be loaded, transported, or stored together in the same transport vehicle or storage facility **unless separated** from each other by three meters or more. However, Class 8 (corrosive) liquids may not be loaded above or adjacent to Class 4 (flammable) or Class 5 (oxidising) materials except that the mixture of contents would not cause a fire or a dangerous evolution of heat or gas.
●	Segregation among different Class 1 (explosive) materials is governed by the compatibility table. Exception: ammonium nitrate (UN 1942) and ammonium nitrate fertiliser may be loaded or stored with Division 1.1 (Class A explosive) or Division 1.5 (blasting agents) materials.
Blank Cells	The absence of any hazard class or division or a blank space in the table indicates that no restrictions apply.
Notes:	**Hazard Zone** - A "hazard zone" means one of four levels of hazard assigned to gasses - Hazard Zones A through D. Hazard Zones A and B are assigned to liquids that are poisonous by inhalation. Consult manufacturer or packaging to identify hazard zones. **PGI** - "Poisonous Gas".

Common DG items in Humanitarian Action

Item	Common Issues	Example Item	Possible UN IDs
Batteries	• Depending on battery type, may be banned or have limited capability to transport on commercial aircraft. • Some battery types are refillable, and may leak harming handlers or reacting to nearby objects or substances. • Damaged or swollen batteries are forbidden in air transport.	Lithium ion	UN3480, UN3481
		Sealed lead acid	UN3028, UN2800, UN3090
		Refillable lead acid	UN2794, UN3171
		Lithium metal	UN3090, UN3091
Biological Hazards	• Heavily restricted on some forms of transport. • May require specialised documentation. Requires specialised storage.	Blood/medical samples	UN3291
		Live infectious substances	UN2814, UN2900
		Medical waste	UN3291

Item	Common Issues	Example Item	Possible UN IDs
Water Purification	• Some products that contain NaDCC as an active ingredient may count as DG if they contain a sufficiently large percentage, or are shipped in a sufficient size or sufficient quantities (Example: Aquatabs above 1.67 grams per tablet). Always check SDS from the manufacturer before shipping. • Keep away from products bearing the 4.3 hazard label.	HTH Calcium Hypochlorite	UN1748, UN2208, UN2880
		NaDCC	UN2465
		Sodium Hypochlorite	UN1791
Cleaning Agents	• If packaging is compromised, may irritate or harm persons handling them. • May react to objects and substances stored nearby, causing slow damage or violent energetic reactions. • Shade and good ventilation is necessary. • When a large quantity must be stored or stowed, if possible, separate in smaller storing quantities. • Keep away from products bearing the class 3, division 4.2 hazard labels and in general from any flammable products.	Alcohol bases hand sanitiser	UN1987
		Chlorine based cleaning solutions	UN1017, UN1908
Compressed Gas	• Compressed gas cylinders are considered DG even when completely depressurised or empty when transported by air. • Compressed gas cylinders may rupture, when stored for long periods of time, or in an unsafe manner.	Oxygen	UN1002, UN1702
		Fire extinguisher	UN1044
		Propane	UN1978, UN1995
Liquid Fuel	• Highly combustible depending on the type. • Fuel is often inappropriately stored in a high temperature or unventilated rooms, or centrally located in a warehouse. • Shade and good ventilation is necessary. • Keep away from substances bearing the division 5.1 hazard label.	Diesel/Gas oil	UN1202
		Gasoline/Petrol	UN1203
		Kerosene	UN1223
		Aviation Fuel/A-1 jet fuel	UN1863
Mechanical Equipment	• Vehicles and generators can be considered DG for air shipping because they contain fuel or other potentially hazardous fluids,	Automobiles/Vehicles	UN3166, UN3171, UN1202, UN2800
		Engines	UN3528, UN3529, UN3530, UN3166
		Generators	UN3166

Item	Common Issues	Example Item	Possible UN IDs
Equipment and Fluids	all of which usually must be below a minimum level or completely drained before transporting in an air craft or sea shipping container.		
		Oxygen Generator	UN3356
		Freezers	UN2857, UN3159
		Antifreeze	UN3082
		Coolants	UN1202
Chemical Fertilizers	• May be highly explosive depending on chemical composition. • Storage in high temperature, lowly ventilated areas, or near other reactive substances might cause serious harm.	Multiple	
Building Related Materials	• Require proper declaration and documentation for most forms of transport, and is often highly regulated by air transport	Pesticides	Many
		Sealants	Many
		Paints	UN1950, UN1263

Dangerous Goods Lookup Tool

Expand to full screen

Dangerous Goods Tools and Resources

Templates and Tools

DG Hazard Labels

Sites and Resources

- UN Model Regulations, Rev. 12, 2001
- UN Dangerous Goods List
- ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air