



Dangerous goods guidance



CONTENTS

- Introduction & Scoping
- What are Dangerous Goods?
 - Responsibilities
- Are your goods classified as dangerous goods for transport?
 - Hierarchy of restrictions
 - How to reference classification and identification using Safety Data Sheet (SDS)
- Packaging
 - Fit for purpose
 - Compatible
 - Compliant with standard requirements
- Marking and labelling
 - Hazard labels
 - Handling labels
 - Other information incl. minimum standards
- Documentation
- Limited Quantity
- Lithium Battery
- Special Provision , Liquids
- Biological Substances, Refrigeration & Dry Ice
- IMDG UK sea crossing, Channel tunnel
- Information likely to be required by the carrier
- Glossary



Introduction & Scoping

Goal Statement:

To provide recommendations/solutions to ensure that all carriers of Dangerous goods, all modes, but in particular Limited Quantity (LQ) have the same level of understanding and knowledge and are conversant with the risks associated with carrying such products.

Brief Background

Dangerous goods are a product line that most carriers have to deal with on a day to day basis. Members of the PCSA have recognised this as potential issue for those who do not hold the same level of understanding as member organisations and/or their service partners, as such this presents a potential risk to anyone involved in the parcel journey.

What are Dangerous Goods?

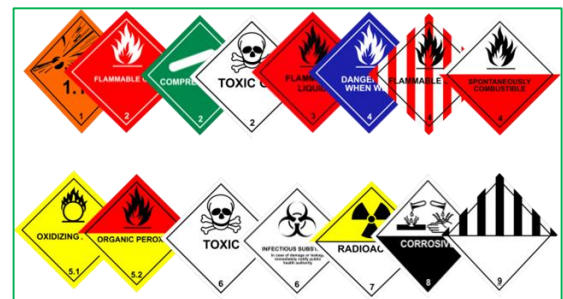
Any substances that can pose a hazard to the health and safety of people or may cause damage to property or the environment.

The Carriage of Dangerous Goods Regulations do not consider how an item will be used, they simply consider whether or not an item may pose a hazard during transport or in the event of an emergency situation. Many products or objects commonly available are classified as hazardous for transport. Some examples can be seen below.






If a substance is found to meet the classification criteria for any of the 9 classes of dangerous goods, the transport of the goods must comply with the dangerous goods regulations for the mode(s) of transport used.

- Class 1** Explosives
- Class 2** Gases
- Class 3** Flammable liquids
- Class 4** Flammable Solids, Other Flammable substance
- Class 5** Oxidizing Substances and Organic Peroxides
- Class 6** Toxic and Infectious Substances
- Class 7** Radioactive goods
- Class 8** Corrosive
- Class 9** Miscellaneous



The carriage of dangerous goods is regulated by all modes of transport used by parcel carriers to ensure the goods are carried safely and to a uniform standard:

Mode	Regulations/Guidance	Scope	Limitations
	ADR/RID	Applies to all road/rail transport journeys	Refer to carriers own restrictions
	IMDG code	Includes domestic and international journeys including sea transport	More restrictive than road/rail – dangerous goods documentation required for all shipments
	IATA DGR ICAO TI	Applies to all shipments by air to domestic and international destinations	Most restrictive – refer to operator acceptance procedures





Responsibilities - "YOU MUST ENSURE"

Shipper/Sender	Carrier	Driver
Packaged & presented : <ul style="list-style-type: none"> • Accordance to DG class • Relevant legislation for transport mode • Fit for stress/strains of the journey • See page 14 	<ul style="list-style-type: none"> • Continued assessment of shipper compliance • Goods presented meet acceptance procedures • All handlers are adequately trained for the duties/risk presented • Handled in safe, reasonable manner 	<ul style="list-style-type: none"> • Complies with education & formal competence • Goods received in correction condition • Aware of limitations incl. rejection where requirements not met

How are Dangerous Goods regulated for transport?

Hierarchy of restrictions

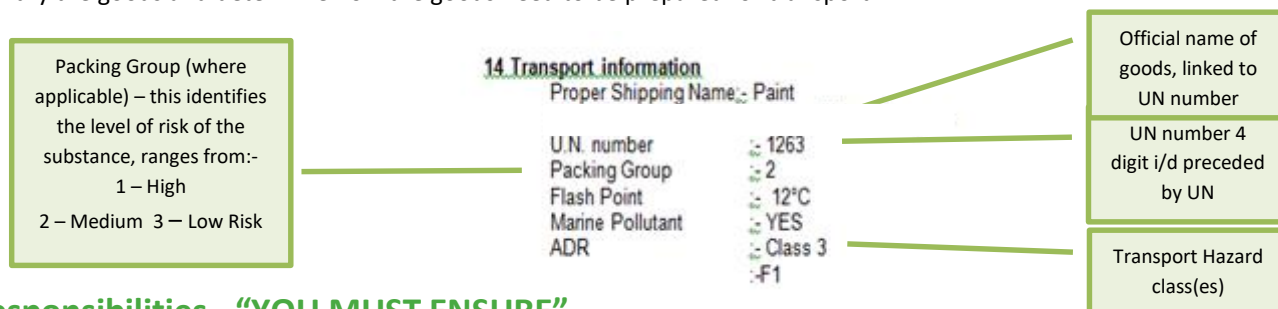
According to the degree of risk posed by the product, substance or article, it may be prepared under the following provisions:

Fully Regulated	Limited Quantities	Excepted Quantities	Special Provision
Large quantity and/or higher risk goods	Small quantity, lower risk goods	Very small quantity, lower risk goods	Can provide exemptions from regulations
UN specification packaging Marking, labelling and documentation Training and competence Transport restrictions	Strong, robust combination packaging Package performance testing may be required Restriction on quantities and volumes (per container and per package) Package marking General awareness training Carriage notification and restrictions on large trailer loads	Strong, robust combination packaging Package performance testing required Restriction on quantities and volumes (per container and per package) – much lower thresholds than Limited Quantities Package marking General awareness training Restricted to maximum of 1000 packs per vehicle	Product specific conditions which when met may provide exemption from some or all of the regulatory requirements May impose minimum packaging requirements in order to comply Carrier may require evidence that requirements of Special Provision have been met
			

How to reference classification and identification using Safety Data Sheet (SDS)

A Safety Data Sheet (SDS) identifies any health safety & environmental risks associated with the use of a substance or article.




Section 14 of the SDS references the classification for **Transport**. This section provides all of the information you will need to identify the goods and determine how the goods need to be prepared for transport:



Responsibilities - "YOU MUST ENSURE"

Shipper/Sender	Shipper/Sender	Shipper/Sender
The SDS you are referencing is up-to-date	You present freight in accordance with requirements of current regulations as they are updated regularly	Have the SDS available, your carrier will probably request a copy for your product and may not accept the goods without it

Packaging

Fully Regulated	Limited Quantities	Excepted Quantities
Large quantity and/or higher risk goods	Small quantity, lower risk goods	Very small quantity, lower risk goods
<p>Where required, UN specification packaging must be used</p> <p>UN Package <i>specification mark</i> must meet conform to the risk presented by the substance i.e. <i>packing group</i></p> <p>Package must be assembled in accordance with manufacturer's instructions</p> <p>Refer to the suppliers package certificate for further details</p>	<p>Strong, robust combination packaging must be used (no single/loose receptacles)</p> <p>Packages should meet the same construction standard as UN specification but does not need to be UN approved</p> <p>Package performance testing may be required (drop and stacking tests)</p> <p>Must be capable of withstanding the stresses and strains of a parcel carrier network</p>	<p>Strong, robust combination packaging</p> <p>Must be triple packed with absorbent material</p> <p>Package performance testing required 1.8m drop test</p> <p>Package must bear the Excepted Quantities mark</p>
		

Responsibilities - "ALWAYS REMEMBER"

Dangerous goods will usually be carried by parcel carriers with their general freight. Therefore, they will be subject to the same conditions in transit as any other package, which could include being:

- Loaded/unloaded multiple times
- Stacked (particularly if you use a "loose load" carrier)
- Sent down chutes and conveyors – this can mean other parcels impacting against the goods
- Dropped (not intentionally)
- Strapped/restrained
- Exposed to changes in climate i.e. temperature & pressure.
- Shock & vibration during carriage by road.

The packaging you choose needs to be able to withstand these forces, so it is important you select appropriate packaging (e.g. robust, 2-ply fibreboard boxes with intermediate packaging to fill any voids and prevent the inner receptacles from moving around inside the box).

Packaging **may** be re-used if it retains its original performance.

Display packaging or cartons intended for palletised transport only **may not** be suitable e.g. crisp box

Senders **should not** rely upon Fragile, Do Not Drop or other similar warnings as a sole control.

Note Carriers may always impose more restrictive requirements, e.g. double bag for liquid, additional void fill.

Marking and Labelling

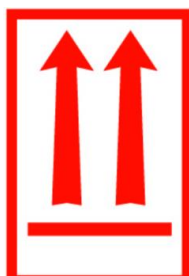
Package marking and labelling must conform to the requirements of the applicable mode of transport. All marking and labelling:

- Must be legible and durable
- Should be displayed on one side of the package
- Must conform to minimum size requirements (e.g. labels must be minimum 100mm x 100mm)
- Must not be obscured or overlapped and must be repeated on the outer layer of any over packing if the originals are no longer visible
- Any previous or irrelevant information must be removed or covered



Handling Labels

Additional handling labels may be required according to the regulations applicable to certain products or the way they are presented.






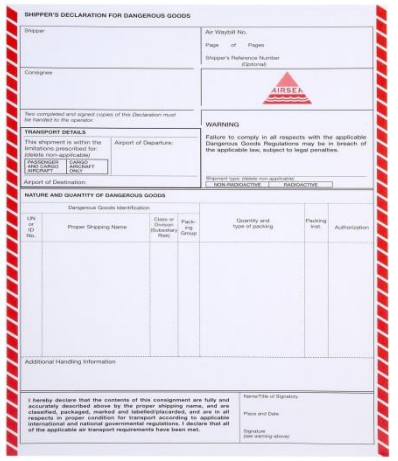


Other Information



Documentation

For most dangerous goods shipments the sender must prepare a *Transport Document*, detailing the contents of the consignment & the way it is prepared. These will vary in content & appearance depending on which regulations apply.

Mode	Regulations/Guidance	Document	Details
<p>ADR/RID</p> 	<p>ADR YFIRLÝSING FYRIR HÆTTULEGAN VARNING / ADR TRANSPORT DOCUMENT FOR DANGEROUS GOODS</p> 	<p>No specific format but</p> <ul style="list-style-type: none"> Key information must appear in the correct sequence 	<p>Not required for</p> <ul style="list-style-type: none"> Limited Quantity (LQ) or Excepted Quantity (EQ) shipments Small Loads within the UK, however the carrier may require one to be presented
<p>IMDG code</p> 	<p>IMO DANGEROUS GOODS DECLARATION</p> 	<ul style="list-style-type: none"> May be SITPRO or MULTIMODAL form Key information must appear in the correct sequence Minimum 2 copies required 	<p>Required for</p> <ul style="list-style-type: none"> ALL shipments including Limited Quantity (LQ) or Excepted Quantity (EQ) shipments
<p>IATA DGR</p> 	<p>SHIPPER'S DECLARATION FOR DANGEROUS GOODS</p> 	<ul style="list-style-type: none"> Most Carriers require the IATA format DG declaration Key information must appear in the correct sequence Minimum 2 copies required 	<p>Not Required for</p> <ul style="list-style-type: none"> Excepted Quantity (EQ) shipments

This must be handed over & travel with the consignment as it contains vital information for the carrier throughout the transport chain.

Limited Quantities ADR 3.4

Identification

Products which may be prepared under the “Limited Quantities” provision are identified in column 7a of the ADR regulations. The entry will describe the maximum net quantity (Litres or Kilos) permitted per inner receptacle

(1)	(2)	(3b)	(3a)	(4)	(5)	(6)	(7a)
1266	PERFUMERY PRODUCTS with flammable solvents	3	F1	II	3	163 340c	5 L

Products not permitted to be shipped under the Limited Quantities provision are indicated by a zero

Package

- The product must be contained in suitable inner receptacles, each not exceeding the total in column 7a
- Intermediate packaging must be used to fill voids, prevent movement and provide any additional protection needed (Corrosives in PG II must be packed in rigid intermediate packaging)
- An outer package of good quality, conforming to the relevant section of ADR part 4 (describing the design and construction criteria for UN specification packaging)
- The total gross weight of the finished package, including internal packaging and any other items inside must not exceed 30kg.
- Where shrink wrapped trays are used, the maximum gross weight is reduced to 20kgs

The finished package must be of sufficient strength and capacity to safely protect the contents from the conditions of transport. The PCSA recommends that consignors should test the capability of their chosen packaging by conducting the stacking tests and 1.2m drop tests described in the international (Air and Sea) regulations.

Marking

Each package must be marked legibly and durably on a white or contrasting background with the following marking, the mark must be at least 100mm by 100mm, this may be reduced to no less than 50mm by 50mm if the package cannot physically display the mark on one face



add orientation arrows if containing liquid,



for Air regulations add Y mark version



If multiple packages are consolidated or palletised for the purpose of easier handling, the mark must be repeated on the outer surface with the words “Overpack” unless it remains visible.

General

- All employees engaged in the preparation and loading of Dangerous goods in limited quantities, must have received general awareness training commensurate with their duties, as per ADR 8.2.3
- The consignor is required to notify the carrier of the total gross mass of the goods to be consigned in a traceable form prior to carriage
- Vehicles over 12T maximum mass carrying in excess of 8T of Limited Quantity goods must display the marking as shown above
- The carrier may impose additional packing requirements particularly for liquids, and request to see confirmation of training and packaging construction standards

Lithium Batteries

Stand-alone Lithium batteries, power banks or articles containing Lithium batteries need to be shipped as fully regulated Dangerous Goods if the Lithium content or power rating exceeds a certain threshold.

Below this threshold these same articles may be prepared under a simplified system providing certain packaging & marking provisions are met.

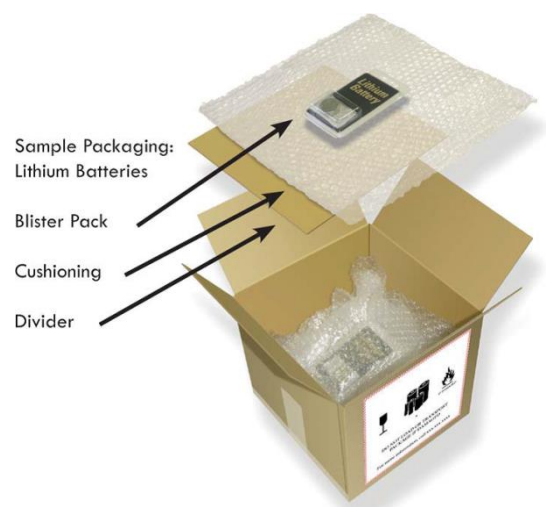
These are described in the various modal regulations as either **section II shipment (air regulations) & Special provision (SP) 188 for sea & road.**

Minimum Packing Requirements

One of the major risks associated with the transport of batteries & battery-powered equipment is fire caused by the short circuit of the battery & as a result the battery terminals coming into contact with other batteries, metal objects, or conductive surfaces.

Methods to protect against short circuit include, but are not limited to, the following:-

- Inner packaging controls, i.e. to completely enclose to avoid contact with conductive material or short circuit activation (if in equipment)
- Cushioning void fill to protect the articles & movement
- Exposed terminal or connectors are protected with non-conductive caps or tape
- Protection eliminating accidental initiation of battery powered articles
- Rigid outer packing, able to withstand 1.2m drop test
- New lithium battery mark, see below



This marking requirement **does not apply** to:

- Packages containing only button cell batteries installed in equipment (including circuit boards)
- Packages containing no more than four cells or two batteries installed in equipment and no more than two packages per consignment.

Special Provision & Liquids

Some articles or substances classified as Dangerous Goods may be exempted from parts or all of the requirements of ADR provided certain conditions can be met under what are called “Special Provisions” (SP)

(1)	(2)	(3b)	(3a)	(4)	(5)	(6)	(7a)
1266	PERFUMERY PRODUCTS with flammable solvents	3	F1	II	3	163 340c	5 L

If SP applies they will be referenced in Column 6, as a number *see above*, & then detailed in ADR section 3.3.

The SP can only be applied where all conditions detailed are adhered to, note carriers may seek additional evidence & /or confirmation.

SP common examples

Product	UN number	SP number	Exemption Summary
Non-Spillable Lead Acid Battery	UN2800	238(b)	Not restricted if capable of surviving pressure and vibration tests, all liquid fully absorbed and cannot leak from a fractured case and terminals protected against short circuit likely to cause heat/fire
Environmentally hazardous substances	UN3077 & UN3082	375	Not restricted if well packaged and packed using inner receptacles of no more than 5L or 5kg each
Fire Extinguisher	UN1044	594	Not restricted if packaged to prevent inadvertent discharge under transport conditions
Alcoholic Beverage	UN3065	144 145	Not restricted if: below 24% alcohol by volume, or Between 24% and 70% in receptacles of no more than 250L
Small Gas Cylinder	UN2037	191	Aerosols and small cylinders, no more than 50ml of non-flammable/toxic gas are not restricted
Helium Gas Cylinder	UN1046	653	Cylinders of no more than 30kg gross and maximum 15.2MPa (152 bar.litre) can be shipped under reduced restrictions
Liquid Nitrogen cryogenic flasks	UN1977	593	Not restricted if transported in an insulated flask, with all liquid fully absorbed into the inner core

Non Hazardous Liquids

Liquid shipments, not classified dangerous or exempt by SP should still be packed to minimise the risk of damage in transit, spill & leak.

Minimum standards would include:-

1. Robust outer package
2. Inner dividers for fragile inner containers
3. Absorbent &/or cushioning material
4. Supplementary leak proof linings e.g. plastic bags
5. Orientation labels on at least 2 sides of the package

Biological, Refrigeration & Dry Ice

Biological substances e.g. human or animal blood or urine samples, being sent for testing, diagnosis or research.

Substances known or suspected to carry a harmful disease are classified under section 6.2 of the Dangerous Goods regulations. These will be defined as:-

- **Category A Infectious substances (UN2814/2900) : contain diseases causing death or serious injury which may be transmitted through contact following release in transport.**
- **Category B Biologic substances (UN3373) : contain diseases causing death or serious injury unlikely to be transmitted through contact following release in transport**

Note. Biological substances known not to contain infectious substances, e.g. blood samples for routine health screening may be consigned as exempt human/animal specimens.

Category A	Fully regulated Dangerous Goods	Can only be carried under full ADR transport requirements
Category B	Exempt from ADR, subject to Packaging instruction compliance (P650) <i>And marked as image below</i>	No special transport requirements
Exempt Human/animal specimens	Must be secure & triple packaged <i>And marked as image below</i>	No special transport requirements



When **refrigeration** containing dry ice or gel packs is used to provide temperature control in transport, the outer package must provide insulation & be of sufficient strength to take the additional weight of the refrigerant.

When **dry ice** is used, the outer package must be vented & also marked **DRY ICE AS COOLANT**

IMDG UK sea crossing, Channel tunnel

Any dangerous goods transport by sea must comply with the International Maritime Dangerous Goods (IMDG) code, this includes UK sea crossings (e.g. Northern Ireland, Eire, Isle of Man, Channel Islands etc.).

IMDG is largely aligned with the requirements of the ADR regulation, however, there are some additional requirements which must be complied with.

Not all parcel carriers will accept dangerous goods if sea transport is required.

Key requirements for transport of dangerous goods by sea:

- All dangerous goods regardless of quantity must be declared
- All dangerous goods must be accompanied by a completed dangerous goods note (DGN)
- All items indicated must be declared by calling for clearance from the vessel operator up to 24 hours prior to shipment, detailing:
 - UN number
 - Class of goods
 - Net/gross weight
 - Type of packaging plus packing group
 - Proper shipping name
 - Flashpoint (if applicable)

The form is titled 'IMDG DANGEROUS GOODS DECLARATION' and includes fields for shipper and carrier information, a declaration section, and a table for listing dangerous goods. The table has columns for UN number, proper shipping name, hazard class, and packaging. It also includes checkboxes for 'Bulk cargo', 'Open', and 'Closed' packaging types.

Segregation (within the vehicle and on board the vessel) may be required which can cause delays depending on other freight being carried.

Weather conditions can also cause delays as dangerous goods may not be accepted in poor conditions.

The vessel operator has the ultimate decision on whether dangerous goods are accepted so delays may be outside of your parcel carrier's control.

Channel tunnel

For journeys carrying dangerous goods via the Channel tunnel, all packages are subject to the ADR regulations but limited to specific classes permitted by the tunnel operator. All ADR placarded vehicles must check in at the tunnel reception area to present documentation prior to the crossing.

Information likely to be required by the carrier

In order to ensure a safe, compliant & on time shipment every time your carrier may request the following additional information :-


1. Disclosure of likely dangerous goods profile as part of a signing-up (account set-up) procedure
2. Safety data sheets or technical information describing nature or classification of goods
3. Consignment size, weights & package types
4. Packaging compliance certification
5. Evidence of competency either training certificates or Dangerous Goods Safety Adviser contact
6. Photographic evidence for packaging & labelling compliance
7. Follow-up conversation &/or site meeting, process review
8. Regular updates, either periodically or post incident review

The shipper has the responsibility to ensure that the goods are classified, packaged and labelled in accordance with the requirements of the relevant regulations and that the carrier is made aware of any dangerous goods the shipper may send.

The carrier is not responsible for ensuring compliance with the regulation this includes specifying or verifying the packaging requirements.



Glossary

Small Load	Goods shipped in compliance with ADR 1.1.3.6 exemptions related to quantities carried per transport unit
Dangerous Goods	Any substances that can pose a hazard to the health and safety of people or may cause damage to property or the environment.
Dangerous Goods	If a substance is found to meet the classification criteria for any of the 9 classes of dangerous goods, the transport of the goods must comply with the dangerous goods regulations for the mode(s) of transport used.
Suitable packaging for LQ	The packaging chosen needs to be able to withstand the forces generated in a standard parcel journey - <i>see page 6</i> .
Lithium Battery threshold	<p>Not exhaustive , but includes:-</p> <ul style="list-style-type: none"> • Manufacturer test obligation • Lithium content volume maximum limitations @ 1g for lithium metal, lithium alloy cell & no more than 20 watt hour for lithium ion cell. • Lithium content volume maximum limitations @ 2g for lithium metal, lithium alloy battery & no more than 100 watt hour for lithium ion batteries. • Inner packaging controls, i.e. to completely enclose to avoid contact with conductive material or short circuit activation (if in equipment) • Rigid outer packing, 1.2m drop test • Chapter 3.3 has been amended 2017 to show that lithium cells and batteries meeting the provisions of SP 188 require a new lithium battery mark, see below.  <p>* Place for UN Number(s) ** Place for telephone number for additional information</p>
Fully Regulated	Any goods that cant be shipped under Special Provisions or other Exemptions such as Limited Quantities, & must comply with the full requirements of the regulations.
Packing Group	Identifies the level of risk associated with a substance Groups I, II & III. I being the highest risk, III the lowest risk.

*This document is intended to be read alongside the appropriate dangerous goods regulations by shippers and members of the transport community to provide guidance and best practice on the transport of dangerous goods in a shared user parcel carrier network.

It is not a substitute for statutory training.

PCSA accepts no responsibility or liability for the transport of dangerous goods.

For further information, please visit www.parcelcarriersafety.com or on Twitter  @safetyparcel