



## Instruction sheet: Dangerous goods at TU Darmstadt

### Carriage of dangerous goods



Unit IV A –  
Occupational  
Safety and  
Environmenta  
l Protection

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## 1. What are dangerous goods?

Dangerous goods (*Gefahrgut*) are substances and articles with hazard characteristics that can be harmful when transported by road, rail, water or air to

- Public safety or order;
- Important common property;
- Life and health of people;
- Animals and property.

(§ 2 Abs.1 GGBefG)

**Dangerous goods are:**

- Most dangerous substances;
- Gases in pressure receptacles such as cylinders, tubes, pressure drums and cryogenic receptacles;
- Infectious substances;
- Genetically manipulated organisms;
- Radioactive materials;
- Other dangerous substances (such as lithium batteries in equipment).

## 2. Legal bases

<b>ADR</b>	Annex A and B to the Agreement Concerning the International Carriage of Dangerous Goods by Road
<b>GGBefG</b>	<i>Gefahrgutbeförderungsgesetz</i> – Act on the carriage of dangerous goods
<b>GGVSEB</b>	<i>Gefahrgutverordnung Straße, Eisenbahn und Binnenschifffahrt</i> – Ordinance on the Transport of Dangerous Goods by Road, Rail and Inland Waterways
<b>GGAV</b>	<i>Gefahrgut-Ausnahmereverordnung</i> – Dangerous Goods Exemption Ordinance
<b>IATA DGR</b>	International Air Transport Association – Dangerous Goods Regulations (IATA – DGR) for the Safe Transport of Dangerous Goods by Air

## 3. Who is responsible?

In accordance with Section 9(5) GGBefG (*Gefahrgutbeförderungsgesetz* – Act on transporting dangerous goods), the person responsible for the transport is the person who

- packs,
- loads,
- ships,
- carries,
- unloads,
- receives,
- unpacks

dangerous goods as an entrepreneur or owner of a company.

## 4. How do I identify dangerous goods?

### 4.1 Marking and placarding of vehicle transporting large quantities of dangerous goods:

- **Orange-coloured plate** in accordance with 5.3.2 ADR, front and rear, such as tank lorries



Petrol / gasoline

Image source: Berndt Gefahrgutausrüstung e.K.

- Placards on the sides of a container or tank trailer

### 4.2 Marking and labelling of packages, drums or jerricans in accordance with 5.2.2 ADR

Placards and four-digit UN number beginning with "UN".

Example: DIESEL FUEL:



For information about UN number, refer to Safety Data Sheet item 14 "TRANSPORT INFORMATION" for hazardous substances and to ADR table 3.2. [https://umwelt-online.de/regelwerk/gefahrgut/adr/adr\\_rid01/32ta\\_gs.htm](https://umwelt-online.de/regelwerk/gefahrgut/adr/adr_rid01/32ta_gs.htm)

Labels in accordance with 5.2.2.2.2 ADR (examples):



Non-flammable,  
non-toxic gases



Flammable  
liquids



Flammable  
solids



Oxidising  
substances



Toxic  
substances



Corrosive  
substances



other dangerous goods, such  
as large lithium batteries



in addition to labels,  
environmentally hazardous  
substance marks, if applicable

The **labels and marks** have an **edge-length of 10 cm**. Smaller labels are only acceptable if the package is too small for the 10 cm stickers or are intended for gas cylinders.



## 5. Use of packaging (packing dangerous goods)

**4.1.1.1** ADR Dangerous goods must be packed in good quality packaging, including intermediate bulk containers (IBCs) and large packagings. This packaging must be sufficiently robust to withstand the impacts and stresses which can occur under normal conditions of carriage.

**4.1.1.3** ADR Unless stated otherwise in the ADR/RID, every packaging, including intermediate bulk containers (IBC) and large packagings, and excluding inner packaging, must match a type.

**(The type approval number must be stated on the packagings.)**

Example: Box made of fibreboard:  4G/X5 Y8 Z8/12/D/BAM 5513-GBOX)

The packaging specifications in accordance with dangerous goods law compliant with Table 3.2 Column 8 (4.1.4 ADR) [https://umwelt-online.de/regelwerk/gefahr.gut/adr/adr\\_rid01/414.htm#x414](https://umwelt-online.de/regelwerk/gefahr.gut/adr/adr_rid01/414.htm#x414) must be observed

## 6. Documentation: Dangerous goods transport document (5.4.1.1.1 ADR)

In the dangerous goods transport document (delivery note), the number of packages, the UN number stating the dangerous good, the class, the packaging group etc. in accordance with 5.4.1.1.1 ADR must be stated.

Examples for UN numbers:

UN 1066 NITROGEN, COMPRESSED

UN 1963 HELIUM, REFRIGERATED LIQUID

UN 1202 DIESEL FUEL

UN 1203 PETROL/GASOLINE or MOTOR SPIRIT

UN 1992 SOLVENTS, FLAMMABLE, TOXIC, N.O.S. (Example: left over solvents)

## 7. Exemptions

### 1.1.3. c) ADR

The carriage undertaken by enterprises which is ancillary to their main activity, such as deliveries to or returns from building or civil engineering sites, or in relation to surveying, repairs and maintenance, in quantities of not more than 450 litres per packaging, including intermediate bulk containers (IBCs) and large packagings, and within the maximum quantities specified in 1.1.3.6. ADR [https://umwelt-online.de/regelwerk/gefahr.gut/adr/adr\\_rid01/adr\\_ges.htm](https://umwelt-online.de/regelwerk/gefahr.gut/adr/adr_rid01/adr_ges.htm). These exemptions do not apply to class 7.

### 1.1.3.6 ADR

#### Exemptions related to quantities (1.000 points rule)

[https://umwelt-online.de/regelwerk/gefahr.gut/adr/adr\\_rid01/1.htm#x1136](https://umwelt-online.de/regelwerk/gefahr.gut/adr/adr_rid01/1.htm#x1136)

- The driver does not need to have an ADR-compliant driver training certificate.
- The vehicle does not need to be marked with an orange-coloured plate.

### § 2 Nr. 6 GGVSEB

Vehicles under 25 km/h maximum design speed.

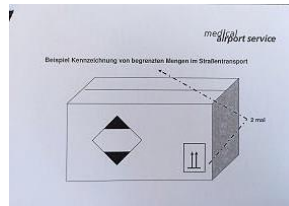


### 3.4 ADR: Dangerous goods packed in limited quantities (Limited Quantities – LQ):

[https://umwelt-online.de/regelwerk/gefahrgut/adr/adr\\_rid01/34.htm#x34](https://umwelt-online.de/regelwerk/gefahrgut/adr/adr_rid01/34.htm#x34)



Mark:



Package:

The mark does not indicate the kind of dangerous goods inside the package.

The total gross mass of the package (combination packaging) must not exceed 30 kg. Individual cylinders / receptacles within the fibreboard package must not exceed 5 litres – depending on the danger involved.

The permissible total quantity per inner receptacle must be calculated in accordance with 3.2 ADR and can be looked up in Chapter 3.2 ADR Table A, column 7a based on the UN-Number.

[https://umwelt-online.de/regelwerk/gefahrgut/adr/adr\\_rid01/32ta\\_gs.htm](https://umwelt-online.de/regelwerk/gefahrgut/adr/adr_rid01/32ta_gs.htm)

#### Examples:

UN 1114 Benzene:	5 litres per inner packaging
UN 1202 Diesel fuel:	5 litres per inner packaging
UN 1203 Petrol/gasoline:	1 litre per inner packaging
UN 1230 Methanol:	1 litre per inner packaging

When shipping dangerous goods in limited quantities in accordance with 3.4 ADR, the following must be stated on the parcel label, delivery note:

- Number of packages;
- Gross weight;
- Dangerous goods in limited quantities in accordance with 3.4 ADR.

**Shipping with a mark in accordance with 3.4 ADR is only permissible for carriage by road within Europe. Other regulations apply to carriage by sea or air!**



### 3.5 ADR: Dangerous goods packed in excepted quantities (excepted quantities – EQ)

[https://umwelt-online.de/regelwerk/gefahr.gut/adr/adr\\_rid01/35.htm#x35](https://umwelt-online.de/regelwerk/gefahr.gut/adr/adr_rid01/35.htm#x35)



Provisions and marks:

no more than 30 grams per inner packaging, no more than 1 kg per outer packaging.

The class must be stated on the mark.

This provision and the mark are nationally and internationally permissible, even for carriage by air, in accordance with IATA DGR.

## 8. Labels and marks for lithium metal batteries and lithium ion batteries



Labels:

UN 3090 Lithium metal batteries – **lithium content exceeds 2 grams**

UN 3091 Lithium metal batteries in equipment – **lithium content exceeds 2 grams**

UN 3480 Lithium ion batteries – **more than 100 Wh**

UN 3481 Lithium ion batteries in equipment, – **more than 100 Wh**

### Lithium batteries and lithium batteries in equipment,

lithium content below 2 grams or less than 100 Wh respectively



Mark:



## 9. Responsibilities of all persons engaged in the carriage of dangerous goods

The **consignor** is required to ascertain prior to handing over dangerous goods for carriage that they are classified and authorised for carriage in accordance with provisions for transporting dangerous goods, that a UN number has been assigned to them, and that a dangerous goods transport document in accordance with provisions for dangerous goods has been issued.

The **packer** must ensure and/or check that the requirements concerning packing, placing in overpacks, labelling and marking are observed in accordance with applicable provisions for dangerous goods.

Before handing over packed dangerous goods, the **loader** must check the packaging for obvious incompleteness or damage and the outside of the packaging for dangerous residues clinging to it. He must not hand over packages if their packaging is incomplete or damaged (possibly) resulting in leakage of dangerous goods or if dangerous residues are sticking to the outside of the packages. Such deficiencies must be remedied first.

The **driver** must ascertain that the vehicle is equipped in accordance with 8.1.4 ADR (fire-fighting equipment) and 8.1.5 ADR (miscellaneous equipment), and have on hand the required dangerous goods transport documents in accordance with 5.4.1 ADR. The driver must visually check the vehicle and packages for obvious defects and deficiencies such as leaks, rips, tears etc. The driver must secure cargo by suitable means capable of restraining dangerous goods to prevent any movement or tipping.

When transporting dangerous goods for which no exemption in accordance with ADR is possible, the driver must have an ADR DRIVER TRAINING CERTIFICATE and is required to carry it on their person. The vehicle must be placarded and marked in accordance with Chapter 5.3 ADR with an orange-coloured plate at the front and rear. The carrier must provide the driver (vehicle crew) with instructions in writing in accordance with 5.4.3 ADR.

The **unloader** must ensure that the correct goods are being unloaded by checking and comparing the relevant information on the transport document with the respective information on the package.

The **consignee** must not delay acceptance of dangerous goods without compelling reasons, and must check the packages visually for damage and leakage.



## 10. Recommendation on receiving (accepting) packages containing dangerous goods, e.g. in the post offices of TU Darmstadt

### Check packages:

1. Is the information provided on the delivery note for the consignee identical with the information provided on the package?
2. Are the packages intact (no visible leakage of dangerous substances)?

### Additional measures:

3. Notify the consignee listed on the delivery note or package that the package must be picked up at the post office immediately.

### As a rule:

- **Dangerous goods must not be stored temporarily in public areas such as corridors.**  
(1.10 ADR: “Security provisions”: Measures or precautions to be taken to minimise theft or misuse of dangerous goods that may endanger persons, property or the environment.)
- **In accordance with provisions for dangerous goods, the consignee is required to accept packages even if they are damaged,** because the driver is not permitted to continue to drive if dangerous substances leak from a damaged package.

### Handling damaged packages leaking hazardous substances:

- **Put on protective goggles and disposable protective gloves for handling chemicals. Place damaged package in a basin on an absorbent mat to catch leaking substances,** if possible without risking your own safety. Take damaged package to a well aerated room or a laboratory with fume hoods.  
If necessary, take damaged dangerous goods package outside.



Photo: Dr. Michael Linker

- **Notify consignee!**
- **Always consider your own safety!**
- **If touching and transporting the package is considered to be dangerous or deemed unacceptable due to its size or condition: Closely guard the package until a person trained in handling dangerous goods arrives to pick it up.** (Do not allow unauthorised persons to handle the package.)





**The following measures must always be observed when transporting dangerous goods:**

**Dangerous goods must be packed in such a way that no dangerous substances can leak from the packaging under normal conditions of carriage.**

- Ensure that cargo is secured properly;
- Transport gases or flammable fluids in well aerated vehicles;
- Keep a fire extinguisher containing at least 2 kg extinguishing agent at hand in the vehicle.

Whenever you need to ship or transport dangerous goods, need advice on classification (assigning dangerous substances or mixtures of substances to a UN number), need suitable UN-approved packaging or labels, please feel free to contact me, your Dangerous Goods Officer, Dita Mönkehues, Unit IVA, Phone: 16-24694.

**Training in how to safely transport or ship dangerous goods is required! I will be happy to advise, inform and train you.**

**Attached:**

**Examples of packages and approved drums, jerricans, fibreboards**

Last updated: 01 February 2024: Dita Mönkehues, Directorate IV, Unit IV A



Photo: Fa. Linde-Gase



Photo: Dita Mönkehues



Photo: Dita Mönkehues, TU Darmstadt



Photo: Dita Mönkehues, TU Darmstadt



Photo: Dita Mönkehues, TU Darmstadt