1.3 TRAINING/EDUCATION
RELOCATION OF CHEMICALS

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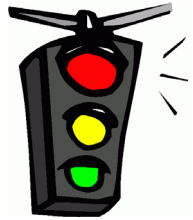
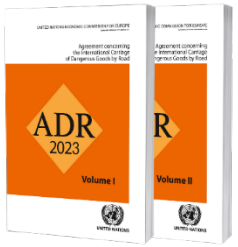
My job is to help you find a answer for your question concerning handling chemicals, chemical and clinical waste and dangerous goods.

You are welcome to call or write me ☺

LEGISLATION (596):





Everyone involved in the shipping of dangerous goods must follow the rules:

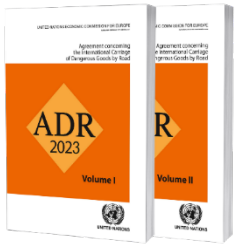
It is important to follow the rules and follow them correctly, as it may result in another person being injured. **Shipper has the biggest responsibility!**

§ 1. The regulation applies to the transport of dangerous goods by vehicles on roads used for general traffic by one or more types of traffic.

§4. Anyone involved in the road transport of dangerous goods in accordance with the regulations must exercise caution and due diligence in order to prevent damage to life, health, the environment or material values.

In Denmark, it is the Ministry of Transport and Building's executive order on road transport of dangerous goods that applies, and it states that we must follow the **ADR convention.**

CHAPTER 1.3 EDUCATION



1. General awareness training:

Personnel shall be familiar with the general requirements for the carriage of dangerous goods.

2. Function-specific training:

Personnel shall be trained, commensurate directly with their duties and responsibilities concerning the carriage of dangerous goods.

3. Safety training:

Personnel shall be trained in the hazards and dangers presented by dangerous goods. The training provided shall aim to make personnel aware of the safe handling and emergency response procedures.

WHAT IS DANGEROUS GOODS?

Dangerous Goods are objects or substances that pose an **acute danger to health, the environment, values and safety.**

Ex. It can be a corrosive liquid that will give an irreversibel damage to your eye, if you get the liquid by accident in your eye.

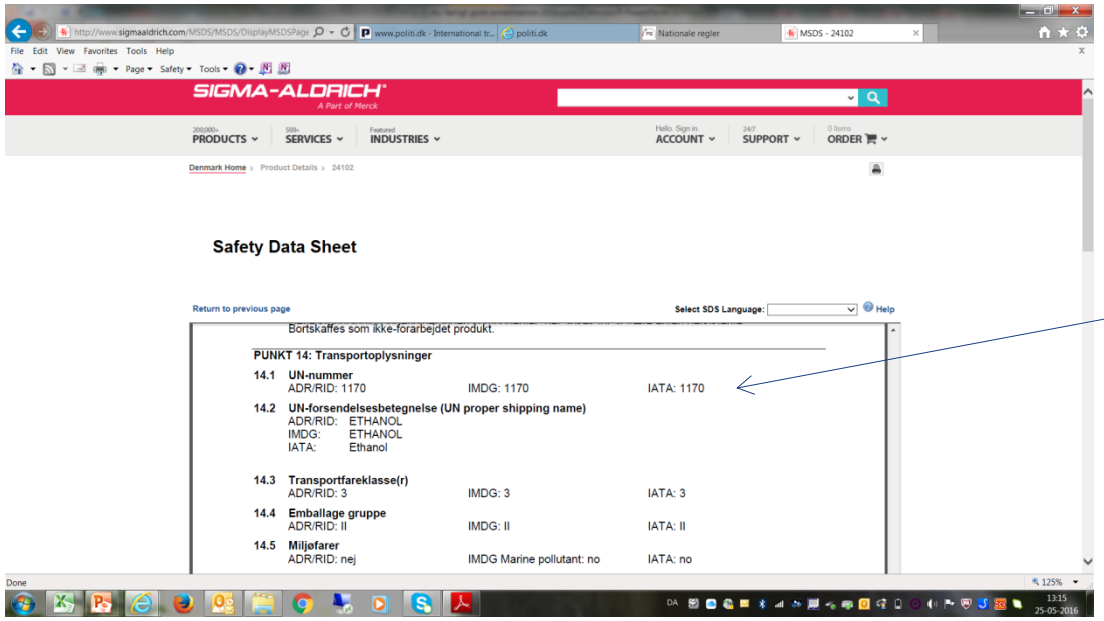
It can be a substance that destroys the vehicle/airplane or others may be injured if it is not apparent that there is a danger associated with the handling of the item.






WHERE TO FIND THE UN NUMBER FOR A CHEMICAL?

Section 14. in the SDS/MSDS – Transport information:



If there is a 4 digit number, it is dangerous goods.

Example:

UN 1170 ETHANOL

Hazard class 3

Packing group II

For gas cylinders the UN number and proper shipping name, must be applied!.

HAZARD CLASSES

Class 1 Explosives

Class 2 Gasses (2.1 Flammable Gas, 2.2 Non-flammable, Non-toxic Gas and 2.3 Toxic Gas)

Class 3 Flammable Liquids

Class 4.1 Flammable Solids, Self-Reactive Substances, Polymerizing Substances and Solid Desensitized Explosives.

Class 4.2 Substances Liable to Spontaneous Combustion

Class 4.3 Substances which in contact with Water, Emit Flammabale Gases

Class 5.1 Oxidizing Substances

Class 5.2 Organic Peroxides

Class 6.1 Toxic Substances

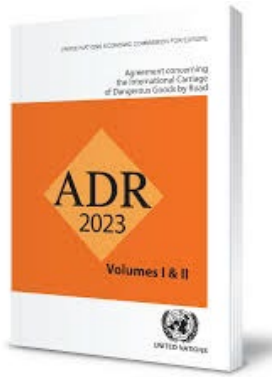
Class 6.2 Infectious Substances

Class 7 Radioactive Material

Class 8 Corrosives

Class 9 Miscellaneous Dangerous Substances and Articles, including Environmentally Hazardous Substances.

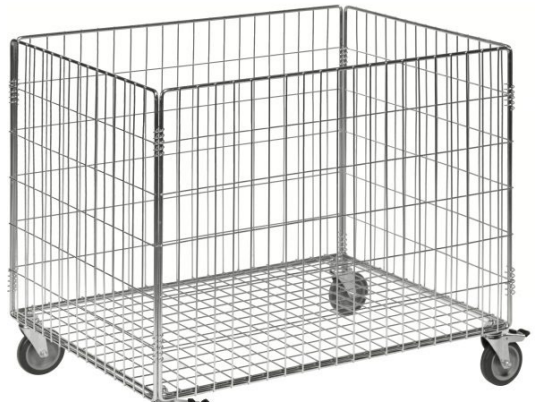
REQUIREMENTS FOR DANGEROUS GOODS



1. Identification of the dangerous goods
2. Klassification – hazard class(es)
3. Packagings
4. Packning, including herunder mixed packing
5. Marking an labelling – packagings, vehicle, containers etc.
6. Documentation
7. Handling and unloading, including mixed loading
8. Training/education of staff depending on the task 1.3, 8.2 plus special.
9. Requirement for vehicle, vehicle crew and equipmen (ADR-approval, wheel chock, fire extinguishers , warning west, shovel, drivers licens, eye rinser, etc.)

PEDISTRIAN VS TRANSPORT IN VEHICLE

§ 1. The regulation applies to the transport of dangerous goods by vehicles on roads used for general traffic by one or more types of traffic.
It is recommended to move chemicals in smaller quantities, as a pedestrian with, for example, a cart, a rolling table with edges, or a trolley with wheels.



CHEMICALS THAT IS NOT DANGEROUS GOODS!

Chemicals that are not classified as hazardous are NOT dangerous goods,
Can be packed in a good quality packackings – no marking/labelling, documentation etc.
Can be moved by the moving company.

Example.:

Agarose

Lactose monohydrate

Ribonuclease A, from bovine pancreas

HAZARDOUS CHEMICALS

Chemicals must be sorted by using **hazard pictograms and H-phrases.**

If the chemicals are moved in a cart, rolling table, trolley, or similar by a walking employee, the dangerous goods regulations do not apply.
When transporting chemicals, safety is importance. It is crucial to keep chemicals that can react with each other separate to avoid any potential hazards.

Therefore, the chemicals must be sorted, see the next slides.

BE AWARE OF REACTIVITY – DO NOT PACK WITH CHEMICALS THAT SHOUL BE AVOIDED!!

Find the information in section 10 in the Safty Data Sheet (SDS):

Example: HCl

PUNKT 10: Stabilitet og reaktivitet

10.1 Reaktivitet
Ingen data tilgængelige

10.2 Kemisk stabilitet
Stabilt under de anbefalede opbevaringsforhold.

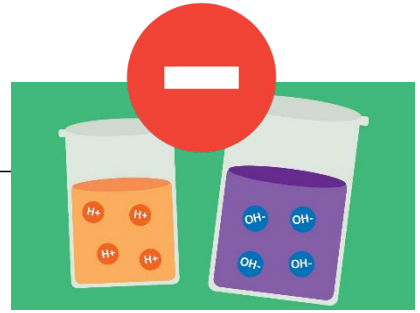
10.3 Risiko for farlige reaktioner
Ingen data tilgængelige

10.4 Forhold, der skal undgås
Ingen data tilgængelige

10.5 Materialer, der skal undgås
Baser, Aminer, Alkali metaller, Metaller, Permanganater, f.eks. kaliumpermanganat, Fluor, metal acetylider, hexalithium disilicide

10.6 Farlige nedbrydningsprodukter
Farlige dekomponeringsprodukter dannet under brand. - Hydrogenchlorid gas

Sigma - H1758 Side 5 af 8



Acid and base = NO GO

PREPARATION – PACKING CHEMICALS

- ✓ Sort the chemicals using the hazard pictograms and H-phrases.
- ✓ Find more information in the Safety Dayasheet (SDS).
- ✓ Pack chemicals that are NOT classified.
- ✓ Pack classified chemicals, be aware of prohibition of mixed packagings!

Acid and base = NO GO

SORTING CHEMICALS

- ✓ Chemicals **without** hazard pictograms – packed in a separate box (can be packed with irritating chemicals).

- ✓ Chemicals labeled with below hazard pictogram and H-phrases - packed in a separate box (can be packed with non-hazardous chemicals).

  - **Irritant for skind and eyes H315 and/or H319,**
  - **Harmful by ingestion, skin contact and/or inhalation H302, H312 and/or H332** acute tokic category 4 and/or
  - **Allergic skin reaction H317.**

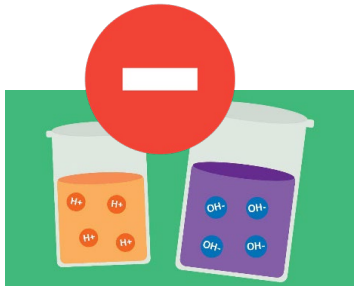
- ✓ Chemicals labeled with below hazard pictogram and H-phrases, packed in a separate box, can be packed together in a box:

  - **Carcinogenic H350 and/or H351,**
  - **Mutagenic H340 and/or H341,**
  - **Reproduction tokic H360, H361 and/or H362,**
  - **STOT enkelt og gentagen eksponering H370, H371, H372 and/or H373,**
  - **Allergic, asthma symptoms or breathing diificulties if inhaled HH334 and/or**
  - **Aspiration toxic H304.**

SORTERING AF KEMIKALIER

✓ **Toxic** chemicals labeled (**H300, H301, H310, H311, H330 and/or H331**), packed in a separate box . Please note that these chemicals are **stored under lock**, it may be in a building, room, or cabinet.

✓ **Corrosive** chemicals (**H314 and/or H318),** be aware of the rules for packing, e.g. acids and bases must be kept separate, see the safety data sheet section 10.



Acid and base = NO GO !

✓ **Flammable** chemicals (**H224, H225, H226 and/or H228**) packed in a separate box. Please note that it is only allowed to have 50 storage units (approximately 50 liters) in a laboratory.

✓ **Oxidizing** chemicals **(H270, H271 and/or H272**) are considered problematic and must be separated and packed separately for safety reasons

QUICK GUIDE

Sorting by hazard pictograms and H-phrases ☺

QUICKGUIDE– PACKING CHEMICALS

- ✓ **Non-hazardous** chemicals
  For example agarose and lactose.

- ✓ Chemicals with **irritant** properties
  For example EDTA and Tris.

- ✓ **Harmful** chemicals
  For example Thiazolyl tetrazolim bromide.

- ✓ **Toxic** chemicals
  For example sodium azide.

QUICKGUIDE– PACKING CHEMICALS

- ✓ **Corrosive** chemicals, acid and bases must be separated to prevent any dangerous reactions or hazards.!
  For example phosphoric acid and sodium hyroxide.

- ✓ **Flammable** chemicals
  For example acetone and ethanol.

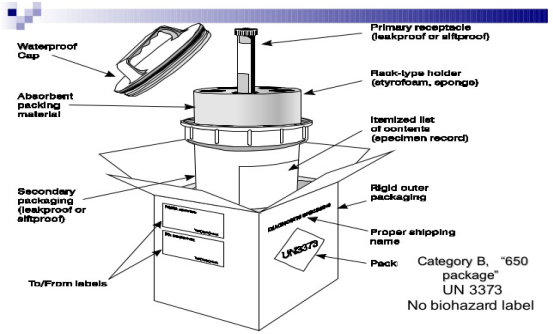
- ✓ **Oxidizing** chemicals
  For example hydrogen peroxide and potassium permangante

OVERPACK.

If there is a lot of small packages, they can be packed together in an ”OVERPACK”.

For example:

BIOLOGICAL SAMPLES



If it is packaged, packed and labeled in the manner below, transport is not covered by the Dangerous Goods regulations:

- ✓ No requirement to use an UN-approved package , but it must be of good quality and capable of withstanding a **droptest** from a height of **1,2 meter**.
- ✓ **Outer** packakging must be **rigid** and at least one surface must have a **minimum dimension of 10 x 10 cm.**
- ✓ The packaging must consist of three components: A **Primary-**, a **Secondary-** and a rigid **Outer** packaging.
- ✓ The primary receptables or secondary receptables msut be leak- or sift proof.
- ✓ The orimary receptacles must be packed in secondary packagings in such a way that, under nomral conditions of transport, they cannot break, be punctured or leak their contents. If multiple **fragile** primary receptables are placed in a single secondary packagings, they must either individually wrapped or **separated** to prevent contact between them.
- ✓ For liquids **absorbent** material must be placed between the primary and the secondary packagings . If there is **any doubt** as to whether or not residual **liquid** may be present in the primary receptabel during transpot then a packaging suitable for liquids, including absorbent material, must be used.
- ✓ The outer packaging must be marked with a **diamond-shaped** square with the wording "**UN 3373**" and each side of the square having a lenght of at least 50 mm. The proper shipping name "**Biological Substance, Category B**" in letters at least 6 mm high must be marked on the outer packaging adjacent to the diamond-shaped mark.
- ✓ The name an adress of the shipper and consignee must be provided on the package.

TRANSPORT GMO

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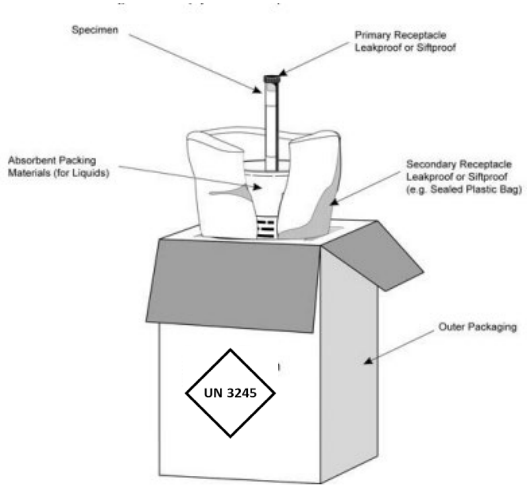
- ✓ The outer packaging must be marked with **a diamond-shaped square with the wording "UN 3245"** and each side of the square having a lenght of at least 50 mm.
- ✓ The name an adress of the shipper and consignee must be provided on the package.



TRANSPORT OF CHEMICALS IN A VEHICLE

If there is ned to transport/move chemicals in a car, please **contact AU´s safety advisor .**
(contact information on slide no. 2).

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