

Factsheet**Carriage of dangerous goods
ADR Transport 2014****Looking to transport hazardous chemicals?
What do you need to do now?**

Please consult the material safety data sheet (MSDS) for your hazardous substances, where you will find the UN number and other information on transporting them in Chapter 14. A hazardous substance will most probably be classified as dangerous goods for transportation, which means that other regulations apply than for handling and storing it.

Please also note the data examples on the following page.

Please contact ETH Zurich's dangerous goods advisor on time with this data and quantity indications. (→ see Contact on Page 7)

Examples of Dangerous Goods packaging:



Depending on the substance properties, amount and type of packaging, there are at least three types of transport (individual factsheets ↓):

- Packaging and transporting dangerous goods (DG) in limited quantities:** see Page 3
- Transporting Dangerous Goods within the exemption limit:** see Page 4 - 6
- Transporting Dangerous Goods above the exemption limit*:** see Page 7 - 8

The details are not always easy to understand. For example:

- 1 * 2.5 litres sulfuric acid UN1830 is considered as dangerous good (DG).
- 1 * 50 ml diethyl ether UN1155 is considered as dangerous good.
- 4 * 1 litre isopropanol UN1219 is considered as „limited quantity“ (if packaged correctly)!

amount	kinds of packaging	volume or masse	unit	type ; description	Gefahrstoffe Gefahrgüter Liste 2014-01-01.xlsx			LQ
					if known	UN-Nr	Classe	
					liquid	remarks		
Total								
1	jerrican	5	= 5	Liter Sulphuric acid 50%	UN 1830	8 II	x	no
2	bottles (PE)	1	= 2	Liter acetic acid	UN 2789	8(3)	x	
2	bottles	2.5	= 5	Liter HNO3 nitric acid 65%	UN 2031	8(5.1)	x	no
1	bottle	1	= 1	Liter HCl conc. Hydrochloric	UN 1789		x	
1	bottle	0.1	= 0.1	kg Antimon	UN 2871	6.1		
3	drums	2	= 6	kg Potassium Nitrite	UN 1488	5.1		
1	bottle	0.5	= 0.5	kg Na-Hydroxide, solid	UN 1823			sodium hydr... yes
1	bottle	1	= 1	Liter Isopropanol	UN 1219	3	x	
1	bottle(PE)	0.2	= 0.2	Liter K hydroxide solution	UN 1814		x	potassium... yes
1	box	30	= 30	kg Accus.alkaline	UN 2795		x	contains liquid
2	drums	4	= 8	kg Mg-Alloys>50%ribbons	UN 1869	4.1 III		no *
2	bottles	1	= 2	kg Magnesium powder	UN 1418	4.3(4.2) III		
1	canister	4.5	= 5	Liter Acetone-Toluene-Mixture	1993		x	no
1	bottle	0.8	= 1	Liter Methanol-DCM-Mixture	nur evtl.,		x	
					if known			

Factsheet

Packaging and transporting dangerous goods in “limited quantities (LQ)“:



Warning: Does not apply to diethyl ether, for instance!

Illustration: 1 litre ISOPROPANOL (**UN1219**) and 500g SODIUM HYDROXIDE, SOLID (**UN1823**)

There are strict rules for packaging hazardous chemicals for transportation. In order to be able to do it properly, training by the dangerous goods safety officer is compulsory.

Restrictions on packing substances that can react dangerously together also apply to small amounts. (Zusammenpack-Verbote).

	<p>Fire extinguisher required</p>	<p>Transport document (delivery note to be retained for later statistical surveys, for instance)</p>	
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<p>Limited Quantities = LQ</p>	<p>Packaging example</p>
<p>e.g. 2* 1 litre ETHANOL, MIXTURE (UN1170) and 2 kg CARBON DIOXIDE, SOLID, AS COOLANT (UN1845)</p> <p>Although approved packaging is not mandatory here, the package should withstand a drop from 1.8 metres. Further regulations: Marking and lettering (Beschriftung), gross mass, net mass of dry ice, resistance to moisture, gas permeability...</p>	



Transporting dangerous goods within the exemption limit

- Driver has complete ADR transport documents ready to hand (not together with dangerous goods)
- Vehicle is roadworthy; load restraint aids available and ready to use
- Visual inspection to verify that load is undamaged (intact), load bed clean
- Sealed 2kg fire extinguisher ABC EN3 (test not overdue), weather-proofed
- Transport of gases only in open or ventilated vehicles
- Restrictions on goods to be packed together / separating regulations
- Ban on smoking and consumption of alcohol
- Instruction by the dangerous goods advisor (safety officer) compulsory



Important information for dangerous goods packages:

Use UN-coded containers (e.g. synthetic material younger than 5 years).



UN number preceded by "UN" (mostly in 12mm lettering).

Labelling with danger labels (100mm * 100mm), diamond shaped!

For liquids, 2 orientation arrows on 2 opposite sides   , e.g. if composite packaging is used.

If outer packaging (->overpack) is used, all labels must be added to the outside:

<p>UMVERPACKUNG / OVERPACK</p> <p>KALIUMNITRIT (UN1488) POTASSIUM NITRITE (UN1488)</p>	
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Examples of dangerous goods packaging:



Please contact ETH Zurich's dangerous goods advisor on time with quantity indications and substance descriptions (examples Page 2).

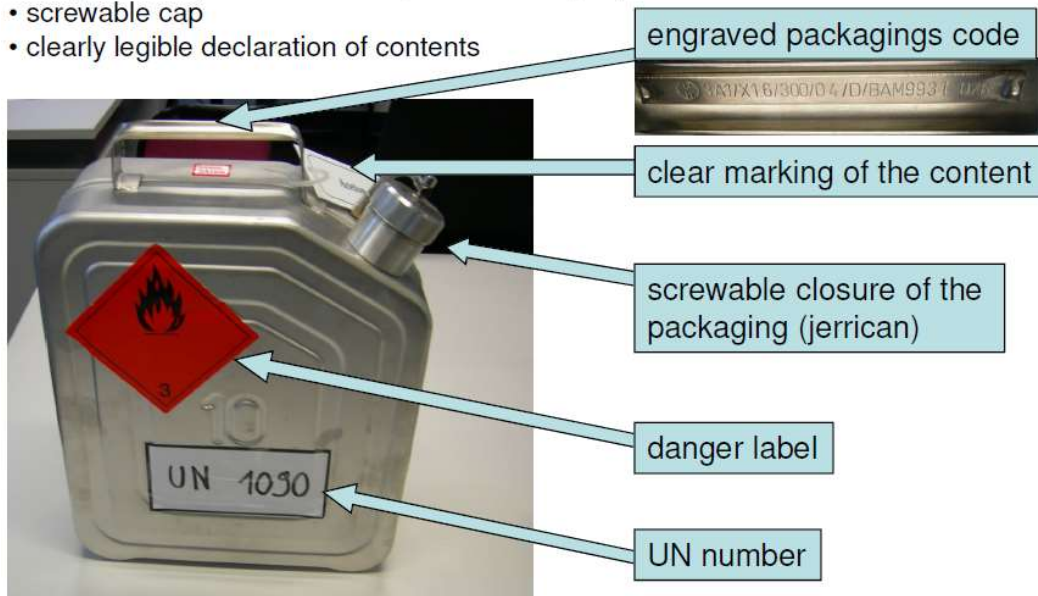
	<p>min. one 2kg fire extinguisher ABC EN3 is compulsory !</p>	<p>Correct ADR transport document is compulsory ! (to be retained)</p>	
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Dangerous Goods

Packaging examples

ADR conform jerrican for carriage of solvents:

- engraved UN codification of packaging (container coding)
- UN number preceded by «UN»
- danger label (100mm*100mm, diamond shaped)
- screwable cap
- clearly legible declaration of contents



Do not exceed highest permissible filler load! (Diethyl ether e.g. only 90% of the total volume)



Dangerous Goods	Packaging examples
<p>e.g. 3*2 kg POTASSIUM NITRITE (UN1488) →</p> <p>and 10 litres ACETONE (UN1090) see previous page</p>	

Supplementary explanations:

Terms:

Excepted package: -> Does not mean that the packer or consignor is relieved from the relevant requirements concerning packaging conditions and marking, lettering (and possibly labelling) of packages. Only the correct packaging and quantity enables transportation under easier conditions.

Exemption limit:

	<p>Warning! Many regulations also have to be followed under the exemption limit of 1000 loading points, but no dangerous goods transport with an orange sign is required.</p>
	<p>Above the exemption limit of 1000 loading points, the carriage of dangerous goods must be conducted by professionals with an orange sign. This already applies for a small bottle of UN3394 butyl lithium, for instance (-> pyrophoric; transport category 0).</p>

Factsheet

Transporting dangerous goods above the exemption limit

- ADR vehicle with police label, roadworthy after test
- Driver with valid driving license and ADR photo ID, roadworthy after test
- Smoking and consumption of alcohol prohibited. The carrying of passengers is prohibited!
- "Dangerous goods" entry in the vehicle registration certificate
- Driver has received transport documents with complete dangerous goods information (ask the dangerous goods advisor); tunnel ban ↓
- Written instructions to be carried in the driver compartment
- Load bed clean, suitable load restraint aids
- Visual inspection of the dangerous goods (undamaged)
- For gases, open or ventilated vehicle
- Restrictions on goods to be packed together and separating regulations for foodstuffs/infectious substances/...
- Prohibition of mixed loads (Class 1)
- Complete equipment ADR vehicle (see picture ↓ on the next page)

**Contact:**

For questions please contact:

Andreas Hurni (SGU) – squ-gefahrengut@ethz.ch – Dangerous Goods Advisor, ETH Zurich
Telephone (office/pager): +41 44 633 44 19

Equipment of the transport unit :

EN3 tested **fire extinguishers**: 1 x 2 kg in the driver's cab ;
additionally in an area protected from the weather and easily accessible,
depending on the highest permissible vehicle mass:

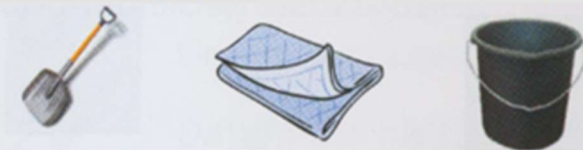
	<u>transport unit <3.5 t</u> + 2 kg = total min. 4 kg	<u>transport unit 3.5-7.5 t</u> + 6kg + 2 kg = total min. 8 kg	<u>transport unit > 7.5 t</u> + 6kg + 2 * 2 kg = total min. 12 kg
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Two self-standing warning signs;
For each vehicle, a wheel chock
of a size suited to the maximum mass of the vehicle and the diameter of the wheel;
Eye rinsing liquid (--> not required for danger label numbers 1, 1.4, 1.5, 1.6, 2.1, 2.2, 2.3)



Additional equipment required for certain classes (3, 4.1, 4.3, 8 and 9):
a shovel, a drain seal, a collecting container

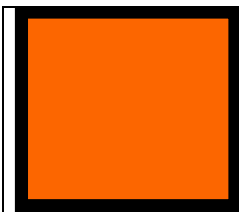
For each member of the vehicle crew:



a warning vest, a portable spark-free light (Ex), Eye protection
(e.g. protective goggles), protective gloves, an emergency escape mask
for each member of the vehicle crew shall be carried on board the vehicle for danger label numbers 2.3 or 6.1



→ Source: folding factsheet, publisher: Fischer Düsseldorf / Sulser Group; VAG Schweiz (amended)



Above the exemption limit of 1000 loading points, the carriage of dangerous goods must be conducted by professionals with an orange sign. This already applies for a small bottle of **UN3394** butyl lithium for instance (-> pyrophoric; transport category 0).