



***CARRIAGE OF GAS CYLINDERS
BY ROAD IN CARS, VANS
AND OTHER VEHICLES***

GUIDANCE FOR DRIVERS AT WORK

Rev 1 : 2005

Many thousands of gas cylinders are transported every day. There are certain measures you should take to ensure that you transport cylinders safely at all times. This leaflet explains what you must do to be safe and comply with the law.

In 1996 The Carriage of Dangerous Goods (CDG) legislation was changed to harmonise with Europe. During 2004 these regulations were replaced by the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (S.I. 568), known as the Carriage Regulations.

The European Agreement Concerning The International Carriage Of Dangerous Goods by Road (**ADR**), implemented by the Carriage Regulations has now been put into place to protect everyone either directly involved, or who might become involved (such as members of the emergency services and public).

1. Do I have to comply?

Yes, everyone carrying gas cylinders in the course of their work in a vehicle must follow basic legal safety requirements.

However the full requirements of the Carriage Regulations do not apply:

- When the quantity of dangerous goods being carried is below the threshold quantity described at the end of this document.
- When private individuals carry dangerous goods, which are packaged for retail sale and are intended for personal use.
- When dangerous goods are carried only incidentally to the enterprise's main activity such as a plumber carrying propane on his way to a job or an engineer taking refrigerant gas to repair a refrigeration system. The total quantity of dangerous goods must also be below the threshold quantity described at the end.

To calculate if the load you are carrying is within this scope please turn to “The Threshold Quantity calculation” section at the back of this leaflet.

However, it is recommended to follow the basic legal safety requirements listed in question 2 at all times.

2. What are the basic legal safety requirements?

Drivers should be trained in:

- The potential hazards and dangers of the goods.
- Safe handling of gas cylinders
- Emergency procedures and the use of fire fighting appliances

A record should be kept of all training. The training should be periodically supplemented with refresher training to take account of regulation changes and should be verified upon commencement of employment.



- **Vehicles** used for the transportation of gas cylinders should be open, if this cannot be achieved the vehicle should be well ventilated. Toxic gases must not be carried in a closed vehicle unless specifically designed for the purpose.
- If an **Unventilated Vehicle** is used the loading door(s) must bear the following notice (with effect from 1st July 2005)

WARNING
NO VENTILATION
OPEN WITH CAUTION

- A **2 kg Fire extinguisher** is required on all vehicles carrying gas cylinders. They should have a minimum capacity of 2 kg dry powder.
- **Cylinder valves** must be closed whilst in transit and any equipment disconnected.
- **Cylinders** should be secured properly and should not project beyond the sides or ends of the vehicle.
- **Cylinder labels** are attached to all cylinders. The labels are produced in accordance with the current legislation, and you must never remove or deface these labels.

The driver does not need to carry documents detailing the load they carry, but in an event of an accident this information would be beneficial to have.

If a leak is suspected... park the vehicle in a safe place and contact the gas supplier.

If you are involved in an accident... advise the emergency services:

- What products you are carrying
- How many cylinders you are carrying

In addition to these general requirements, you will need to make specific provision if your load is above the Quantity Threshold. If you are carrying more than 8 cylinders or any toxic gases, you may be above the limit. You should consult your supply note or perform the threshold quantity calculation to determine if you need to follow the Carriage Regulations in full. It is each driver's responsibility to know whether the load they are carrying is above the threshold.

Please see the section "Threshold Quantity calculation" at the back of this leaflet for more information.

3. What should I do if a load is above the threshold?

There are six main points you should consider:

3.1 INFORMATION



At the start of the journey the **driver** should always have in their possession:

- For each product:
 - The UN number
 - The proper shipping name
 - The classification of the product as in ADR
 - The number and contents of the cylinders, including product volume or mass.
 - **Emergency information** with clear instructions for the driver - this is known as a TREM card.

- The name and address of the consignor (the organisation sending the goods) and consignee (the recipient of the goods).

All the information (except the Emergency Information) must be kept for at least 3 months after the journey.

The gas supplier will provide all the necessary information to you when you collect your gas.

3.2 VEHICLE MARKING

The **driver** must ensure that an orange plate is displayed at the front and rear of the vehicle. The plates must always be removed or covered up if the vehicle is not carrying any dangerous goods.

3.3 EQUIPMENT

The **vehicle** must carry the following equipment:

Any emergency equipment specified in the emergency information (TREM card) provided to the driver.

Fire fighting equipment

- Vehicles up to and including 3.5 tonnes gross vehicle weight
The vehicle must have a minimum of two dry powder fire extinguishers with a total capacity of 4 kg, this includes the 2 kg extinguisher detailed in question 1.
- Vehicles between 3.5 and 7.5 tonnes gross vehicle weight
The vehicle must have dry powder fire extinguishers with a minimum total capacity of 8 kg, of which at least one shall have a minimum capacity of 6 kg.
- Vehicles above 7.5 tonnes gross vehicle weight

The vehicle must have dry powder fire extinguishers with a minimum total capacity of 12 kg, of which at least one shall have a minimum capacity of 6 kg.

At least one wheel chock of a size suited to the weight of the vehicle and to the diameter of the wheels.

Two self standing warning signs.



A **warning vest** for each member of the crew.

A **pocket lamp** for each member of the crew.

3.4 TRAINING

In addition to the training previously mentioned, the **driver** must possess a suitable Dangerous Goods Vocational Training (ADR) Certificate, if the vehicle is above 3.5 tonnes gross vehicle weight (GVW). After 1 January 2007 an ADR Certificate will be required even when the vehicle is below 3.5 tonnes GVW.

3.5 DANGEROUS GOODS SAFETY ADVISER

Your employer (or you if self-employed) must appoint a specially qualified Dangerous Goods Safety Adviser to advise, check and report on the enterprise's compliance with the Carriage Regulations.

3.6 OTHER DUTIES

There should be no passengers without the Operator's authorisation.

There should be no smoking in the vicinity during loading and un-loading.

The engine should be stopped during loading and un-loading, unless it is necessary for the actual process.

4. *What will the authorities be looking for?*

The police and VOSA (Vehicle Operations Safety Agency) working with guidance from the HSE will be looking for breaches of the legislation. If identified the HSE may prosecute offenders. The police will be looking for gas cylinder labels, potential leaks and that appropriate securing devices have been fitted and are being utilised correctly. They will also satisfy themselves that the driver has been trained and understands the hazards and knows what to do in an emergency.

5. *Where else can I go for further information?*

The HSE website- <http://www.hse.gov.uk/cdg/index.htm>

By calling the HSE InfoLine- 08701 545500

The Threshold Quantity calculation

To perform the threshold quantity calculation and hence determine whether you are above or below the threshold limit you must:

- Determine what **transport category** the gas you are transporting is in.
- Determine the quantity of gas you are carrying for each category and translate this into **Points**

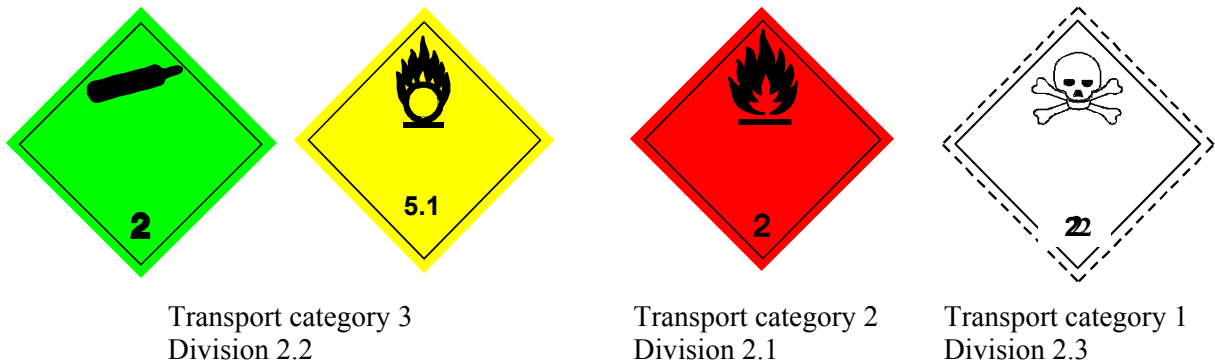


- Use the correct calculation for your load to identify whether you are above or below the threshold.

Transport Categories

All gases have been classified by ADR into four Transport categories. The classifications relate directly to the hazard diamonds for each product. If there are two diamonds, the left most diamond should be consulted to determine the correct category.

The table below shows the transport categories together with the corresponding hazard diamonds and lists the main industrial gases in each category.



Transport category	Gas category	UN Division	Industrial gases in category
1	Toxic	2.3	N/A
2	Flammable	2.1	acetylene, hydrogen, propane, propylene.
3	Asphyxiant and Oxidizing	2.2	argon, carbon dioxide, compressed air, helium, nitrogen oxygen
4	Empty cylinders		

Table 1

For gases not listed and mixed gases check the hazard diamond on the cylinder to determine the relevant category.

Points

To determine the quantity of the gas in a cylinder the following rules apply.

Compressed gases = water capacity of cylinder in litres
 Liquefied gases = nett mass of gas in kg

Dissolved gases = nett mass of gas in kg



The water capacity is the amount of water the cylinder can carry, the nett mass of the gas is the total mass of the gas contained in the cylinder, this excludes the cylinder and cylinder valve.

Each litre/ kg you carry represents a Point. The Point is used to **calculate** the load and hence determine whether the new regulations apply in full.

The calculation

The calculation you perform will depend on whether you are transporting gases from one category or a combination of categories.

... For a load containing **one** transport category

Points per cylinder x number of cylinders = Total load Points

Look at Table 2 and identify which limit applies to the load you are carrying. If you are below the limit: read Section 2 and act accordingly.

Transport category	Gas	Point limit	Hazard diamonds
1	Toxic	20	2.3
1	Ammonia and Chlorine	50	2.3
2	Flammable	333	2.1
3	Asphyxiant and Oxidizing	1000	2.2
4	Empty cylinders	Unlimited load exemption	

Table 2

... For mixed loads

For each category of gas carried there is an associated calculation. This calculation must be performed for individual categories of gases, the Points for each category must then be added together.

There are five steps:

1. Calculate the total of toxic gas Points (T Points) and multiply by 50



- (1a Calculate the total of Ammonia and Chlorine and multiply by 20)
- 2. Calculate the total of flammable gas Points (F Points) and multiply by 3
- 3. Calculate the total of asphyxiant/ oxidant gas Points (A Points)
- 4. Add the these values together to acquire Points for total load
- 5. Check whether the total is below or above 1000

The process is detailed in full below.

1. Calculate toxic gas Points (T Points)

Toxic gases are regarded as the most potentially hazardous gases, so the quantity allowed is only a fiftieth of the amount of asphyxiant/oxidising gases. Therefore in mixed loads the toxic gas quantity is multiplied by 50 before it is added to the other categories.

Points per cylinder x number of cylinders x 50 = T Points

Note: Ammonia and Chlorine have a special concession to be multiplied by 20.

2. Calculate flammable gas Points (F Points)

Flammable gases are considered more potentially hazardous than asphyxiant or oxidising gases so you can only carry one third of the amount. Therefore, to calculate for mixed loads, the flammable gas quantity is multiplied by 3 before it is added to the other gases.

Points per cylinder x number of cylinders x 3 = F Points

3. Calculate asphyxiant/ oxidant gas Points (A Points)

Points per cylinder x number of cylinders = A Points

4. Add the three values together to acquire Points for total load

T Points +F Points + A Points = Total Points for mixed load.

- 5. If the total Points for a load is below 1000, the small load requirements detailed in sections 1 and 2 apply; if above 1000 the regulations must be observed in full, see section 3 for more information.

Example: You are carrying: one large propane cylinder (47 kg), one small argon/CO₂ (10 litres) and 2 large oxygen cylinders (47litres). (Figures are rounded up to two significant figures)

Product	Cylinder size.	Number of gas cylinders	Points per cylinder (b)	Transport category	Multiplying factor (c)	Total Points (a) x (b) x
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		(a).				(c)
Propane	47 kg	1	47	2	3	141
Argon/CO ₂	10 litre	1	10	3	1	10
Oxygen	47 litre	2	47	3	1	94
Total Points for load carried-						245

Table 3

The total number of points does not exceed the 1000 limit, therefore this load is below the threshold and the requirements detailed in section 2 should be adhered to.

BRITISH COMPRESSED GASES ASSOCIATION

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