

03

POCKET GUIDE
SAFETY

Safe transport of gas cylinders

MESSER 
Gases for Life



Dear user of Messer gases,

Messer produces and supplies a broad portfolio of products and gases in cylinders. The transport of gases is associated with a variety of potential hazards. It is advisable to employ the services of a company specialising in this area to transport gases – even in small quantities. **We would be happy to arrange delivery of our products to you.**

This safety leaflet is intended to inform you about the basic precautionary measures that need to be considered when transporting small quantities of gas by vehicle.

Please familiarise yourself with this basic safety information before transporting any gases. In order to transport gases safely, it is essential that you do not exceed the maximum permissible loading capacity of the vehicle, that you secure the load, and that you fit the cylinder valve protection caps.

The transport of gases is subject to the provisions of the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR).

Even where the ADR regulations do not apply (e.g. to the transport of gases as a private person and for purely domestic use, or when the upper limits on quantities are not exceeded, etc.), you must comply with the general duty of care so as to protect yourself and others. Furthermore, you are obliged to comply with the applicable national laws and regulations concerning the transport of dangerous goods.

Messer staff will also be glad to instruct you in the safe handling and transport of gases.

Please keep this safety sheet within easy reach at all times.

Important

With each product, Messer provides you with a safety data sheet containing important safety instructions on gases. Please familiarise yourself with this information.

Your Messer Team



Vehicle types, basic rules and maximum load capacities

Open vehicles

Open vehicles or flat-bed trucks with side walls are to be preferred for the transport of gas cylinders. Do not exceed the maximum load capacity of the vehicle.



Enclosed commercial vehicles

Enclosed commercial vehicles are vehicles in which the driver's cab is separated from the cargo bed by a fixed bulkhead. The driver's cab must be ventilated separately from the cargo space. The cargo space may or may not be ventilated. Before unloading, it is important to be aware that a hazardous atmosphere may have formed in the cargo space. Open the doors to the cargo space carefully. Do not exceed the maximum load capacity of the vehicle.



Passenger cars

Passenger cars are intended for the transport of persons and are generally not designed for the transport of dangerous substances. These vehicles are equipped with a single ventilation system. Do not exceed the maximum load capacity of the vehicle.



The load securing examples are symbolic representations.

Secure the load in the luggage compartment of the vehicle. Never put it on a seat or in front of or behind a seat.

Keep the windows open and switch the ventilation to the highest setting.

Receipt of gas cylinders

Make sure that the cylinder label is present and easily legible. If the label is illegible or missing, do not use this gas cylinder.

Exchange the gas cylinder for a cylinder with a label that is in good condition.

Make sure that the name of the gas on the cylinder label matches your order.

As a new user, you must be issued with the relevant **safety data sheet** containing further safety instructions for the gas that you have received.

Check the UN number (material number) to see if it matches with the UN number on the SDS and on the delivery note.

Hazards and precautionary measures

The pressure in gas cylinders is high. Rupturing gas cylinders or cylinder valves can cause serious injury to persons or damage to property. The influence of heat may cause any safety valves that are present to open, thus resulting in the release of gas. If liquefied gas escapes, it evaporates and produces large amounts of gas.

Do not transport any other dangerous goods (e.g. dyes, paints, solvents, acids, etc.) while you are transporting gases. Carry with you a fire extinguisher that is suitable for vehicles. Do not smoke or use an open flame inside or in the vicinity of the vehicle.

Handle gas cylinders with care and avoid any kind of damage as a result of external influences. Do not throw gas cylinders from vehicles or ramps when loading or unloading.

Inform yourself about:

- the properties of the gases and their associated hazards
- the safety data sheet
- the safe transport, loading and unloading of gas cylinders
- the safe storage of gas cylinders
- the safe handling of gas cylinders and associated equipment
- emergency measures

Mixed loads

In general, mixed loads of the gases mentioned in this leaflet are permitted. The European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) becomes fully applicable if the total quantity of gas to be transported should exceed a value of 1,000 ADR points. If this is the case, Messer is obliged to refuse to load vehicles that are not intended for the transport of gas.



Hazard symbols

Hazards

	<p>Non-flammable, non-toxic gases May cause suffocation.</p>
	<p>Flammable gases May result in fire or explosions. May cause suffocation.</p>
	<p>Oxidising substances (gases) May result in powerful reactions or explosions in combination with combustible materials. May facilitate ignition of materials and will greatly intensify fires.</p>
	<p>Toxic gases „Only transport by experts permitted“ Risk of poisoning. May result in a toxic atmosphere and is hazardous to health through inhalation and skin contact.</p>
	<p>Corrosive substances (gases) „Only transport by experts permitted“ Risk of corrosive burns. May react powerfully with water or other substances. Spilled substances may give off corrosive vapours. May cause permanent changes to human skin tissue at the area of contact and destroy metals. May damage the eyes, skin and respiratory tract.</p>
	<p>Gases under pressure Compressed, liquefied, cryogenic or dissolved gas</p>
<p>Cryogenic liquefied nitrogen</p>	<p>May cause asphyxiation and cold burns. Any leaks will result in the release of large quantities of gas and displace the breathable air, which may cause drowsiness, loss of consciousness and death by asphyxiation. Direct contact with liquid nitrogen can cause cold burns.</p>
<p>Dry ice (solid CO₂)</p>	<p>May cause asphyxiation and cold burns. Gas leakage in the vehicle interior displaces the breathable air and may cause drowsiness, loss of consciousness and death by asphyxiation.</p>

NOTE: The conventional hazard symbols are listed in the above table. If the shoulder of your gas cylinder is marked with other symbols, **please contact Messer staff.**

Transport of gas cylinders

Transport only a limited number of gas cylinders:*

Vehicle type	Maximum load			
Open vehicle or trailer	Less than the maximum load capacity of the vehicle or trailer AND less than 1,000 ADR points in total			
	Cylinders of 0 - 12 litres (max. length 1 metre)		Cylinders of 12 - 50 litres	
Enclosed commercial vehicle	Separately ventilated cargo area	Unventilated cargo area	Separately ventilated cargo area	Unventilated cargo area
	24	4	12	4
Passenger car	4 gas cylinders in the luggage compartment Acetylene: 2 gas cylinders		Transport is not recommended	

* The figures in the tables are only estimates. They may turn out to be lower, depending on the specific circumstances.

Make sure that the cylinder valves are closed. Secure all of the cylinders during transport. Secure the gas cylinders such that they cannot shift, even in the event of an accident.

If a cylinder valve for liquefied gas is equipped with a safety valve (e.g. as in the case of CO₂), transport the gas cylinder in an upright position.

In open vehicles, all of the gas cylinders must generally be transported in either a horizontal or a vertical position. When transported horizontally, the gas cylinders should lie either parallel or at right angles to the longitudinal axis of the vehicle. Gas cylinders near the bulkhead should always lie at right angles to the longitudinal axis. Handle empty gas cylinders with the same care as full ones. Never transport a gas cylinder without cylinder valve protection (either an integrated valve protector or a sealing cap). Small gas cylinders lacking integrated valve protection and gas cylinders that cannot be fitted with

a sealing cap must be transported in cylinder containers that ensure the same level of safety as gas cylinders with valve protection.

Never transport a gas cylinder to which a pressure reducer or other equipment is fitted, even if the cylinder valve is closed. Unload gas cylinders as soon as possible after arrival at the destination (because ventilation is considerably reduced in stationary vehicles). Never leave gas cylinders unattended in the vehicle. Never use gas cylinders in a vehicle unless the vehicle is specifically designed for such use.

Transport of dry ice (solid CO₂)

Dry ice should only ever be transported in thermally insulated containers that are intended for this purpose. Note that these containers are not gas-tight. Dry ice should be transported over short distances only.

Never transport dry ice in plastic sacks, bags or any other packaging that is not intended for this purpose.

Make sure the load is properly secured. Provide a separately ventilated cargo space. If you transport dry ice in an enclosed commercial vehicle without separate ventilation or in a passenger car, keep the windows open and switch the ventilation to the highest setting. Never leave the load in the vehicle overnight. Never use dry ice in the vehicle. Transport only a limited quantity of dry ice:*

Vehicle type	Maximum load	
Open vehicle or trailer	The maximum load capacity of the vehicle or trailer must not be exceeded.	
Enclosed commercial vehicle	Separately ventilated cargo area	Unventilated cargo area
	Maximum load capacity of the vehicle	200 kilograms
Passenger car	50 kilograms (in the luggage compartment)	

* The figures in the tables are only estimates. They may turn out to be lower, depending on the specific circumstances.



Transport of liquid nitrogen (LIN)

Refrigerated liquefied nitrogen is a very cold liquefied gas and is transported in insulated, **closed** cryogenic vessels under pressure or

in insulated, **open** cryogenic vessels (Dewar flasks). Transport only a limited number of **closed** cryogenic vessels:*

Vehicle type	Maximum load			
	Vessels of 0 - 50 litres		Vessels of > 50 litres	
Open vehicle or trailer	Do not exceed the maximum load capacity of the vehicle or trailer AND less than 1,000 ADR points in total			
Enclosed commercial vehicle	Separately ventilated cargo area	Unventilated cargo area	Separately ventilated cargo area	Unventilated cargo area
	5	2	2	1
Passenger car	1		Transport is not recommended	

* The figures in the tables are only estimates. They may turn out to be lower, depending on the specific circumstances.

Transport only a limited quantity of liquid nitrogen in **open cryogenic vessels** (Dewar flasks):*

Vehicle type	Maximum load	
	Open vehicle or trailer	Transport is not recommended
Enclosed commercial vehicle	Separately ventilated cargo area	Unventilated cargo area
	60 litres	10 litres
Passenger car	10 litres (in the luggage compartment)	

* The figures in the tables are only estimates. They may turn out to be lower, depending on the specific circumstances.

Bear in mind that Dewar flasks are not gas-tight and that cold gas escapes from them continuously.

They should therefore be transported over **short distances** only.

Never attempt to make Dewar flasks gas-tight. Always transport Dewar flasks upright, otherwise liquid will leak out.

Ensure that cryogenic vessels are properly secured. Make sure that the valves are closed (if present). Make sure that the valve caps or closures are correctly fitted (if present). Unload vessels as soon as possible after arrival at the destination (because ventilation is considerably reduced in stationary vehicles). Never leave the load in the vehicle overnight. Never use liquid nitrogen in the vehicle.

What to do in an emergency

Gas leaks

If gas is escaping and creating a hazardous atmosphere in the vehicle, proceed, where possible, as follows: Park the vehicle as far away as possible from other people and vehicles, and switch off the engine. Ventilate the vehicle by opening the doors. If it is possible to do so without risk, try to close any valves that may be open. Keep any onlookers away. Do not continue your journey if safety cannot be guaranteed.

If the escaping gas is flammable, the following actions must also be performed: Switch off any possible sources of ignition. Call the fire brigade. Give your exact location and precise details about your load.

Fire

Stop immediately and leave the vehicle in a safe place. Make sure the vehicle is properly secured. If it is possible to do so without risk, try to extinguish the fire. Call the fire brigade.

Traffic accident

If you are involved in a traffic accident while driving a vehicle that is carrying gases, call the fire brigade. Give your exact location and precise details about your load.

Why is it not advisable to transport gases in enclosed commercial vehicles and passenger cars?



Emergency braking may be necessary in certain traffic situations.



Acetylene gas leaking from the valve of a gas cylinder ignited inside a delivery van. The driver narrowly escaped. The vehicle burned out in just two minutes.

Important

Messer may refuse to load a vehicle if this seems appropriate after due consideration of the vehicle and the product.

This leaflet contains basic information only. It is not a substitute for training and is not intended as such. This leaflet contains no legal advice with regard to the transport of products. As the carrier of the product, you are exclusively responsible for compliance with all applicable laws and regulations as well as with the requirements of your insurance. You are likewise obliged to ensure that the gases are transported in accordance with regulations.



You can request additional **pocket safety guides** on our Internet page or obtain them directly from our experts.

A web tutorial accompanies this pocket guide.



Important

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