

NEW ZEALAND

Gas Cylinder & Pack sizes and water capacity (W.C.)

The following cylinder sizes and their approximate nominal water capacities (in litres) should be used to assess load limits.

Nominal W.C. (Litres)

High Pressure Cylinders

e.g. Oxygen, Argon, Nitrogen, CO₂, Hydrogen, Helium, Shielding Gases.

High Pressure Cylinders and Dissolved Acetylene

PACKS*		200 – 800
Large	J	50
G	50	
Medium	F	25
E	15	
Small	D	10
A	3	

Liquid Dewars

e.g. Liquid Nitrogen 150 – 450

Low Pressure Cylinders

e.g. LPG, Refrigerant, Sulphur Dioxide, Ammonia.

H	220	
Large	G & S	110
Medium	R	65
T	47	
FT	44	
ET & TS	36	
Small	EX & P	25

*Packs: multiply number of cylinders in pack by W.C. of cylinder type.

Cryogenic Liquid Receptacles

There are two types of portable cryogenic receptacles:

1. Open Dewar's that continuously vent into atmosphere. An oxygen deficient atmosphere will be created, therefore ensure very good ventilation, and secure the Dewar in an upright position. Do not transport or use open dewars with oxygen.
2. Closed vessels with pressure relief device. Ensure that the vessel is in good condition, and that the valve(s) are in the correct position for transport.

- Do not transport cryogenic receptacles with inert gases, or containers with dry ice, in the passenger compartment.
- Wear clothing that protects the skin when handling cryogenic receptacles.

TRANSPORT EMERGENCY PROCEDURE

Do this for ALL Emergencies

- Shut off the engine and any electrical equipment.
- Move people from the immediate area and keep upwind.
- Consider initial evacuation distance of 100 metres in all directions.
- No smoking or naked flames within 50 metres.
- Stop gas leakage if safe to do so.
- Do not use excessive force on the valves. Do not attempt to operate a damaged valve.
- Avoid breathing gas and contact with skin or eyes.

- Remove the cylinder from the vehicle to an open area if it is safe to do so.
- Notify the Fire Brigade and police and tell them that gas cylinders or receptacles are carried on board.

Vehicle Accident

- Carry out action under "FOR ALL EMERGENCIES".
- Do not move vehicle if this could cause spillage or generate sparks.
- Warn other traffic.

Fire

- Carry out action under "FOR ALL EMERGENCIES".
- Call the Fire Brigade.
- Stop source of flammable gas if safe to do so.
- Do not extinguish burning gas other than by cutting off the source of gas supply: if this is not possible, leave gas to burn.
- Do not approach cylinders suspected of being hot.
- Remove cool cylinders from path of fire.
- If the fire gets out of control and cylinders are heated, evacuate personnel at least 100 metre and warn against approaching.

First Aid

- **Asphyxia** – move to fresh air, and resuscitate if necessary.
- **Cold burns** – remove any clothing that restricts blood circulation, unless it is stuck to the skin. Flush or soak the affected area with luke warm or cold water.
- **Hypothermia** – wrap in blanket and move to warm place.
- Call the local emergency services to seek professional medical treatment.

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TRANSPORTING GAS CYLINDERS or cryogenic liquid receptacles in vehicles

Consider this BEFORE transporting your gas cylinders or cryogenic receptacles...



in an enclosed sedan, in the boot...



inside a van or on the back of open vehicle.

IMPORTANT

This pamphlet gives information on the hazards, safe handling and transport requirements for gas cylinders or cryogenic receptacles. Please read the rest of this pamphlet fully BEFORE transporting gas cylinders or cryogenic receptacles, especially in an enclosed vehicle.



Australia New Zealand
Industrial Gas Association

HAZARDS



Above: Aftermath of an explosion caused by a buildup of flammable gas in a vehicle.

Compressed and liquefied gases are potentially hazardous for the following reasons:

- Some gases are very flammable and a leakage can create an explosive atmosphere in a vehicle.
- Oxygen enrichment causes material to ignite easily and will increase the intensity of the fire. Nitrous oxide (laughing gas) has similar properties.
- Inert gases can cause oxygen deficiency and asphyxiation.
- Toxic or corrosive gases are hazardous to health.
- The gas pressure is high and a ruptured cylinder or valve can cause serious injury or damage.
- Cryogenic liquids are very cold and can cause cold skin burns and metal brittle fracture.
- When a liquefied gas is released it vaporises and creates large amounts of gas.
- Heat may cause any safety device fitted to operate and release contents.

Information on the hazards can be found on the cylinder label, and in the Material Safety Data Sheet that is freely available from your gas supplier.

Risks

- **DG Class* 2.1 Flammables** (e.g. Acetylene, Ethylene, Hydrogen, LPG) – may cause flammable or explosive atmospheres in the vehicle compartment.
- **DG Class* 2.2 Inerts** (Nitrogen, Argon, Shielding Gases) – may cause an asphyxiating atmosphere leading to drowsiness, unconsciousness and death.
- **DG Class* 2.3 Toxic** (Sulphur Dioxide, Insectigas) may lead to toxic atmosphere which is hazardous to health by breathing and/or skin contact.
- **DG Class* 2.2/5.1 Oxidising** (i.e. Oxygen, Nitrous Oxides) – may cause some materials to easily ignite (i.e. oil) and will increase intensity of a fire.
- **DG Class* 9 – Dry Ice** (Solid CO₂) **and DG Class* 2.2 refrigerated liquids** (Liq. N₂, Ar) – evaporate to large volumes of inert gas (see above).
- **Unsecured Cylinders** may cause damage to people, vehicles and can lead to violent cylinder rupture in transport. When transporting cylinders always ensure they are secured in place.

* Refer to Dangerous Good Classes.

PRECAUTIONS

General

The safest and recommended method to transport cylinders (e.g. gas cylinders and cryogenic receptacles) is by a professional gas transport company. Occasionally, there might be a need of using other transport systems and it is then essential to follow safety instructions for full and empty cylinders:

- Secure all cylinders against moving during transport. Consider also the forces in a traffic accident;
- Limit the number of cylinders to be transported;

- Use open vehicles or trailers in preference to any enclosed vehicles or trailers. Do not cover with tarpaulin;
- Ensure that the contents label on the cylinder can be clearly read;
- Never drop cylinders, or submit them to shock;
- Where possible use mechanical lifting devices and trolleys to move cylinders;
- Wear safety shoes or boots, safety glasses or goggles, and leather protective gloves when handling cylinders;
- Smoking is strictly forbidden when loading, transporting, and unloading any cylinder;
- Always transport liquid gases and acetylene cylinders in an upright position.

Enclosed Vehicles

If there are no other practical methods of transport, enclosed vehicles may be used subject to the following recommendations:

- Transportation of cylinders in the passenger compartment should always be avoided whenever possible.
- If the cylinders are in the passenger compartment, at least one window is opened and the ventilation fan is on high speed when transporting the cylinders.
- If cylinders are in the boot, the boot lid is held opened in a fixed position: check the car manufacturer's manual whether driving with open boot or open rear door is allowed or not;
- Unload the cylinders as soon as possible after arrival at destination. (Ventilation decreases considerably when the vehicle is stopped or parked);
- Do not store or leave unattended in vehicle overnight, or for long periods (more than 1 hour);
- Do not use the cylinders in an enclosed vehicle;
- Carry a fire extinguisher suitable for vehicle fires;
- Do not transport cylinders containing toxic or flammable gases in enclosed vehicles.

When cylinders are continually transported in enclosed vehicles (such as ambulances, service vans with welding equipment, etc.) the following is recommended:

- A permanent system should be in place to secure the cylinders (gas cylinders and cryogenic liquid receptacles);
- The vehicle should be equipped with adequately sized ventilation openings;
- The cylinders should be carried in a separate, gas tight compartment, ventilated to the outside.

When loading of cylinders at a gas supplier site or shop, the personnel responsible for the sale and/or loading the cylinders should provide the safety instructions on loading and transport to the driver, and make sure that these are properly understood.

Loading and transportation of cylinder must comply with local regulations.

Gas Cylinders

Before loading a cylinder into an enclosed vehicle:

- Tighten (do not overtighten) the cylinder valves and check that they are properly closed;
- Use the valve outlet sealing nut when available;
- Check carefully for gas leakage, (using approved leak detection fluid - see your gas supplier);
- Never transport a cylinder if a leak has been detected on it during loading;
- Never transport cylinders with regulator or other equipment attached;
- Do not remove any valve protection device (if fitted) during transport.

Law

- Land Transport Rule: Dangerous Goods applies.
- Information is available on Land Transport New Zealand (LTNZ) Fact Sheets 67, 68 and 69.
- Requirements of Standard NZS5433 must be met.

Documentation

Dangerous Goods Declaration documents and 'D' endorsement on driver's license are required if you carry more than any of the quantities of Dangerous Goods listed below.

Placards

A placard is a 250mm Dangerous Goods Class label that must be attached at the front and rear of the vehicle. Placarding is required if you carry:

Quantities greater than 250 Litre W.C.* of Class 2.1 (flammable gas) such as:

- Acetylene
- Hydrogen
- LPG

OR

Quantities greater than 250 Litre W.C.* of Class 2.2 (inert and oxidising gas), such as:

- Argon
- Carbon Dioxide
- Helium"
- Nitrogen
- Nitrous Oxide
- Oxygen

OR

Quantities greater than 25 Litre W.C.* of Class 2.2 Cryogenic Liquids. (except Liquid Nitrogen)

OR

Quantities greater than 100 Litre W.C.* of Class 2.2 Liquid Nitrogen.

OR

Quantities greater than 50 Litre W.C.* of Class 2.3 (toxic gas)

OR

You are paid for the transport (hire or reward)

Segregation

Store oxygen and fuel gases separately.

Segregate fuel gases from:

- Oxidizing agents
- Flames and sources of ignition
- Other combustible material

* Refer overleaf for cylinder water capacities.