Law
- The Australian Dangerous Goods Code (A.D.G.C.) applies.
- Local and National Dangerous Goods transport regulations apply.

Documentation
Dangerous Goods Consignment documents and Emergency Procedure Guides are required in the vehicle when Dangerous Goods are transported, except if:

- The Dangerous Goods are transported for own use,

AND
- The quantity is no more than 25% of the quantities listed below.

Placards
A placard is a 250 mm 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 1,000 Litre W.C.* of Class 2.2 / 5.1 (inert and oxidising gas), such as:

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

OR
Quantities greater than 250 Litre W.C.* of Class 2.3 (toxic gas)

OR
Quantities greater than 250 Litre W.C.* of mixed Class loads

For packaging sizes and filling pressures, refer to your gas supplier.

*WC = Water Capacity

Cryogenic Liquid Cylinders

There are two types of portable cryogenic receptacles:

1. Open dewar's that continuously vent into the 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 content.
2. Portable liquid cylinders with a pressure relief device. Ensure that the cylinder is in good condition, and that the valve(s) are in the correct position for transport.

Do not transport:
- Portable liquid cylinders in enclosed vehicles;
- Dry ice in enclosed vehicles.

TRANSPORT EMERGENCY PROCEDURE

Do this for ALL Emergencies

- Shut off the engine and any electrical equipment.
- Move people from the immediate area and keep them up-wind.
- Consider an initial evacuation distance of 100 metres in all directions.
- No smoking or naked flames allowed within the evacuation distance.
- Stop the 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 in the gas and contact with skin or eyes.
- Remove the gas cylinder from the vehicle to an open area, if it is safe to do so.
- Notify the emergency services and tell them that gas cylinders or receptacles are carried on board.

Vehicle Accident

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

Fire

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

First Aid

- Asphyxia – move person to fresh air, 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 the person in a blanket and move him / her to a 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.

anziga
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 an enclosed vehicle.
- Oxygen enrichment causes material to ignite easily and will increase the intensity of a fire. Any oxidizing gas, e.g. Nitrous Oxide (laughing gas) has similar properties.
- Inert (Non-Flammable/Non-Toxic) 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.
- Unsecured gas cylinders may cause injury when projected out of place in cases of accidents or rapid traffic movements.
- 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 activate and release the gas contents of the cylinder.

Information on the hazards can be found on the cylinder label, and in the 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** (e.g. Nitrogen, Argon, Shielding Gases) – may cause an asphyxiating atmosphere leading to drowsiness, unconsciousness and death.
- **DG Class* 2.3 Toxic** (e.g. Sulphur Dioxide, Insectigas) may lead to a toxic atmosphere which is hazardous to health by breathing and/or skin contact.
- **DG Class* 2.2/5.1 Oxidising** (e.g. Oxygen, Nitrous Oxides) – may cause some materials to easily ignite (i.e. oil) and will increase intensity of the fire.
- **DG Class* 9 – Dry Ice** (Solid CO_2) **and DG Class* 2.2 refrigerated liquids** (e.g. Nitrogen, Argon, Oxygen) – evaporate to large volumes of inert gas (see above).
- **Unsecured Cylinders** are heavy and may cause injury or damage to vehicles and can lead to a violent cylinder rupture in transport. When transporting cylinders always ensure they properly are secured from moving side wards and upwards.

PRECAUTIONS

General

The safest and recommended method for transporting cylinders (e.g. gas cylinders and cryogenic receptacles) is by using the transport services provided by your gas supplier.

Occasionally, there may be a need to use other transport methods in which case it is then essential to follow safety instructions for full and empty gas cylinders:

- Restrain all cylinders against moving during transport (consider the forces generated in a traffic accident);
- Always transport liquefied, refrigerated and flammable gas cylinders in an upright position;
- Limit the number of cylinders to be transported;
- Use open vehicles or trailers in preference to any enclosed vehicles or trailers. Do not cover the gas cylinders with a tarpaulin;
- Ensure that the contents label on the cylinder can be clearly read;
- Never drop gas cylinders, or submit them to shock;
- Where possible, use mechanical lifting devices and trolleys to move gas cylinders;
- Wear safety shoes or boots and leather protective gloves when handling gas cylinders, consider the need for safety glasses or goggles;
- Smoking is strictly forbidden when loading, transporting, and unloading any gas cylinder.

Enclosed Vehicles

Ventilation is the key to reducing the risk of a fire or explosion.

Trades Vehicles

- Use an open vehicle such as a utility as this provides the best ventilation and avoids the risks of gas accumulation.
- If you are transporting the gas cylinder inside a trade vehicle:
  - keep the gas cylinder in a purpose built sealed compartment or cabinet that provides adequate ventilation of any leaking gas to the outside of the vehicle;
  - A side-mounted sealed compartment with its own door, ventilated externally is best practice.
- Do close the gas cylinder valve and disconnect the regulator, hoses and torch prior to transport;
- Do regularly check for leaks from valves;
- Do secure the gas cylinders and keep them upright;
- Do ensure the vehicle is well ventilated;
- Do unload the cylinder from inside the vehicle immediately on reaching your destination, unless the vehicle has a side mounted (side mounted cabinets are best practice – must it be a side mounted sealed cabinet or simply a ventilated sealed cabinet) sealed cabinet ventilated externally.

Passenger Vehicles

Do not transport gas cylinders in the passenger compartment of any vehicle due to the difficulty of providing appropriate load restraint.

Transporting gas cylinders inside the driver or passenger compartment of passenger cars is extremely dangerous and could cause an explosion, fire, exposure to toxic gas, or asphyxiation.

In the specific case where a small medical gas cylinder is required for use by a patient, it is recommended that the vehicle be fitted with an adequate means of restraining the cylinder, for example via a secure fixed bracket arrangement, designed for the gas cylinder to be carried. As a minimum, the medical gas cylinder should be stowed securely in the passenger foot-well, as to minimise any unintended movement.

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 gas cylinders (and cryogenic liquid receptacles);
- Gas cylinders should be carried in a side mounted sealed compartment with its own door, ventilated externally.

When loading gas cylinders at a gas supplier's 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,

Gas Suppliers may refuse to load certain vehicles based on their assessment of the risk associated with the product to be loaded, the particular vehicle and the method of loading and restraining the product.

Gas Cylinders

Before loading a cylinder into an enclosed vehicle:

- Tighten (do not overtighten) the cylinder valves and check that they are properly closed;
- Check carefully for gas leakage. Never transport a cylinder, if a leak has been detected during loading;
- Check that the valve outlet protection cap is fitted where required. Never remove any valve protection device (if fitted) during transport;
- Never transport gas cylinders with a regulator or any other equipment attached.