

Cylinder Safety

NIGP is delighted to deliver all the information you required in order to ensure the safety of cylinders while transported, stored and used.

Cylinder Care

Always maintain the cylinder valve free of grit, dirt, oil or water ingress in to the cylinder valve, any failure may have impacted the safety and/or quality.

Valve care

If grit, dirt, oil or water enters the cylinder valve, the safety and/or quality may be compromised and gas leakage may occur.

To prevent contamination of the cylinder valve, always use valve safety caps provided along with the cylinders when not in use.

Prior to assembling regulators and fittings, it is most important to ensure there are no foreign particles or dirt in the cylinder outlet.

Clean the cylinder valve by using a dry, clean and dirt free cloth and do not push any material in to the valve socket. Clean compressed air or nitrogen also can be used to blow out any loose particles or dirt from the valve sockets with proper safety measures for the operatives such as eye and ear protection.

Avoiding cylinder contamination – backflow

Backflow occurs when air or gas enters a cylinder by flowing through an open or unsealed valve, which may resulted to contamination of the gas as well as fire and explosion depends on the hazardous nature of the gas in the cylinders.

Precautions must be taken to ensure that no backflow of liquid, air or gas can occur either when the cylinder is connected or when it is in storage.

The following should be ensured by the end user:

- Always close the cylinder valve when the cylinder is not in use.
- Never leave an empty cylinder connected to a process.
- Never use a cylinder as a receiver for waste gas, liquid or any other material.
- Use and maintain appropriate equipment to help prevent backflow.

Automatic shut-off/isolation-valve

These valves are activated by a low pressure signal when the supply gas cylinder pressure reaches a level which requires the cylinder to be replaced. An alarm should normally be incorporated into the system to alert the operator to change the cylinder. More complex systems may use auto-change-over arrangements, to automatically switch to 'standby' cylinders when the supply pressure falls to a pre-determined level.

Backflow Preventative measures

To avoid contaminants entering the cylinder, the valve must be closed immediately after the gas use has completed.

When cylinders are connected to a system or process in which the process pressure can exceed the actual cylinder pressure, adequate precautions must be taken to avoid backflow in the cylinder.

Fit a non-return or check valves

This is a simple and inexpensive measure help to prevent back-flow and cylinder contamination. However, these valve types require appropriate design and selection, and need regular inspection and maintenance to ensure that they remain effective over the time.

What to do if your cylinder becomes contaminated

If you suspect a cylinder become contaminated, please inform immediately to NIGP.

Prior to return the cylinder, please provide a label with any relevant information about the known or suspected contamination.

This information is required for the repair and test before reusing those cylinders.

Please note:

- Never let oil or grease touch a cylinder or fittings. Lubrication of cylinder valves and fittings is highly dangerous as well as unnecessary. High pressure oxygen will react violently with grease; it may explode or ignite violently.
- Never use jointing compounds. Do not apply white or red lead, jointing compounds or jointing tape to any cylinders, valves or fittings.

- Oxygen equipment is at most risk from oil and grease: greasy hands, rags and gloves must not come into contact with any part of the cylinder or fittings.
- Normal body oils do not usually cause contamination, but it is a sensible precaution never to touch any surface which is subject to oxygen under pressure.

Handling Cylinders

Security caps

All NIGP cylinders are fitted with a cylinder valve which must not be removed or tampered for any reason.

Some cylinders have a security cap over the cylinder valve indicating that they have been filled and checked. Immediately prior to use, this cap may be removed by rotating the hexagon nut in either direction using the regulator spanner. This will cause the cap to split for easy removal.

If you have difficulty removing the security cap, please contact NIGP and ask for assistance.

Valve guards and protection caps

Cylinders fitted with hand wheels (and some others fitted with valves) are normally fitted with valve guards or valve protection caps.

Valve guards should not be removed. Valve protection caps should be replaced after use. Always return your cylinder with the valve in the closed position and the valve guard or cap (where provided) in place.

Periodic inspection and testing of cylinders

If you own your cylinders you must fulfil your statutory obligations with regard to periodic inspection and testing.

If you rent cylinders from NIGP, as the owner of the cylinders, ensures that all legal regulatory requirements are met. This includes, for example, in relation to The Carriage of Dangerous Goods and Use of Transportable Pressure Receptacles Regulations, in respect of construction and periodic examination and testing.

Because cylinders are covered by the transportable equipment regulations, there is no need to include cylinders in any Written Scheme of Examination prepared for a static pressure system (for example, which comes within the scope of the Pressure Systems Safety Regulations).

Pressure regulators

Valve outlets are specially threaded to receive suitable pressure regulators or manifold hoses.

Regulators should initially be screwed in by hand and then finally nipped and tightened using a spanner.

To open a spindle-key type cylinder valve, rotate the spindle anti-clockwise using the special spindle key K5, which is obtainable from NIGP Trade Outlets.

Some cylinders are fitted with hand wheels which remove the need to use a spindle key.

Valve outlet threads

Valve outlets threads for flammable or toxic gases are usually left-hand threaded, i.e. turned anti-clockwise to close. Valve outlets threads for non-flammable & non-toxic gases are usually right-hand threaded, i.e. turned clockwise to close.

This convention helps to limit the inappropriate interchange of fittings between cylinders containing flammable gases and non-flammable gases.

- Non-flammable & non-toxic gases such as oxygen, nitrogen, argon and breathing air generally have right-hand valve outlet threads
- Flammable gases such as acetylene, hydrogen, propane and mixtures containing fuel gas generally have left-hand valve outlet threads

The convention means that oxygen and fuel gas pressure regulators are usually not interchangeable. Spindle keys are interchangeable.

Note:

The cylinder valves on all gas cylinders, whether they contain flammable or non-flammable gas, are right-hand threaded, i.e. opened by turning the spindle anti-clockwise and closed by turning the spindle clockwise. Never open an acetylene cylinder valve completely: 1.5 turns is sufficient

NIGP permanent gas cylinders are all fitted with cylinder valves in which the spindles have collars to prevent them being completely unscrewed. There may, however, still be a few dissolved acetylene cylinders which have not yet been returned for this modification. As a general rule for dissolved acetylene cylinders, never turn the spindle more than one and a half turns, and certainly no more than three revolutions.

Never tamper with cylinders in any way; if in doubt, please contact NIGP focal person.

Never repaint, change markings or identification, or interfere with valve threads.

Never attempt to mask damage to cylinders.

If a cylinder has been involved in a fire, never try to hide this, for example by painting over the scorch marks. It is highly dangerous to mask damaged cylinders.

Never attempt to scrap a cylinder you do not own, return to NIGP.

Pressure relief devices

Pressure relief devices are fitted to certain NIGP cylinders. Where fitted they are either:

- Relief valves (which re-seal when pressure falls to normal)
- Bursting discs (which discharge the whole cylinder contents, if operated).

NIGP propane cylinders are fitted with pressure relief valves which operate at approximately 26 bar. Carbon dioxide (CO₂) cylinders are fitted with a bursting disc which operates at approximately 180 bar. This disc is fitted on the cylinder valve.

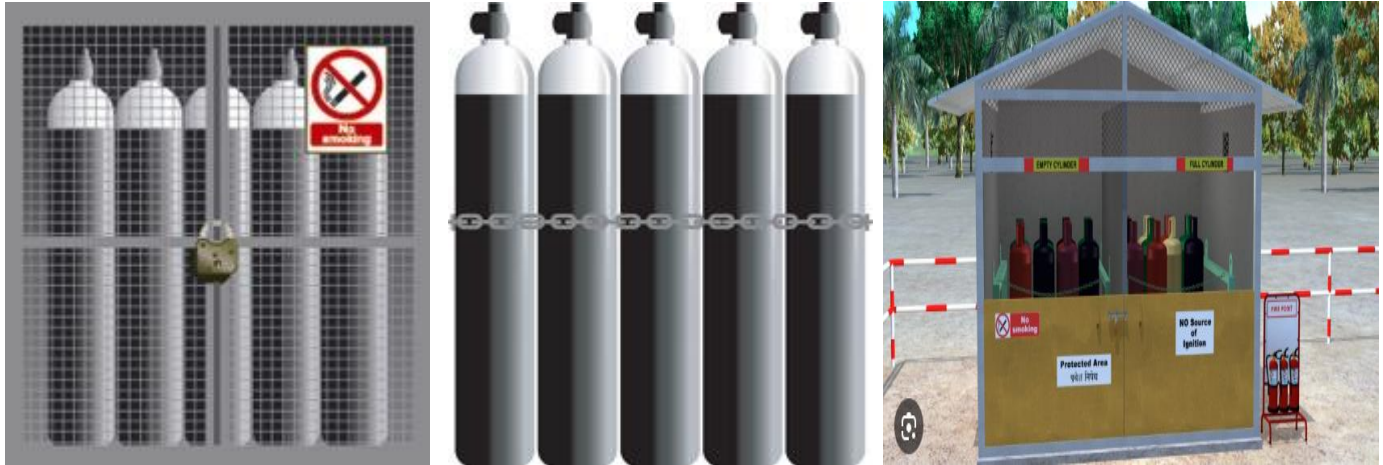
An opened spindle should never be left against the backstop, but should be turned back at least half a turn to avoid seizure in an open position.

If a cylinder is involved in an incident or otherwise appears to be damaged, withdraw it from service, keep it separate with a label and return to NIGP.

Never mix gases in a cylinder; this must only be carried out by an authorized specialist under controlled conditions. It is illegal and lethally dangerous for unauthorized parties to fill cylinders, including mixing, topping-up or transferring contents from one cylinder to another.

Storing Gas Cylinders

Some gas cylinders may be large, heavy and relatively unstable due to the small base-diameter to height ratio



Always store cylinders properly

- Store cylinders in a well-ventilated, preferably outside on a level, well-drained surface. A covered storage area may be needed for some gases (for example, medical gases), but any roof should be arranged so as not to significantly affect ventilation
- Store cylinders vertically in a rack or secure with chain to prevent toppling
- Store full and empty cylinders separately, rotating your cylinder stock holdings so the oldest cylinders are used first
- Segregate cylinders by the property classification of the gas (flammable, inert, oxidant, etc.)
- Ensure appropriate signage is used and is legible.

Make yourself aware of the properties of the gases

There are specific storage requirements for certain gas cylinder products.

Storage of cryogenic, liquefied and heavier-than-air compressed gases shall only be considered after assessing and controlling the risks, including those of gases collecting in low-lying areas such as drains, basements and ducts.