



WORKPLACE SAFETY HEALTH NOTICE (WSHN)

TOPIC INJURY TO WORKERS AND DAMAGE TO ASSETS CAUSED BY EXPLOSION OF PRESSURISED GAS CYLINDER				Reference Number: 2024/WSHN/02
Approved by: Acting Director of Compliance and International Affairs Division	Endorsed by: Acting Interim Chief Executive Officer	Issue date: 19 April 2024	Expiry date: None	Revision No: 01

The Safety, Health and Environment National Authority (SHENA) would like to remind all principals, employers, occupiers, self-employed persons and persons at work to be aware of the risks associated when working with the use of a pressurised gas cylinder and to take the necessary safety precautions to avoid any undesirable incidents when handling gas cylinders.

In 2023, an explosion inside a building occurred when a pressurised gas cylinder, containing nitrogen, fell causing the control valve to break off releasing sudden and destructive high-pressure gas. As the nitrogen cylinders were interconnected, the gas cylinder with the broken valve becomes a missile causing three other standing nitrogen cylinders to topple over and damaged. As the result of the explosion, one worker was seriously injured and another worker sustained minor injuries. The explosion also caused significant damage to the property.

PRESSURISED GAS CYLINDER'S HAZARDS

Pressurised gas cylinders can be hazardous due to their physical and chemical characteristics. Examples of these hazards are listed below:

- Chemical hazards such as flammable gases that cause fire or explosion near any ignition sources, oxidizing gases (e.g. oxygen or nitrous oxide) that can cause spontaneous combustion, exposure to toxic or corrosive gases and asphyxiation from non-toxic, non-flammable gases by displacement of oxygen.
- Incorrect storage.
- Leaks or faulty equipment/connections.
- Physical risks / manual handling.
- Sudden release of gas if the cylinder is damaged (torpedo effect).
- Pressure-compressed gas cylinders are filled to a pressure of 200-300 atmospheres.

SAFE WORK PROCEDURES IN HANDLING PRESSURISED GAS CYLINDERS

- Workers must be competent and well-trained in the safe operation of pressurised gas cylinders. This includes understanding the potential hazards involved and placing appropriate controls as mitigation before carrying out the task.

- When required, handlers must wear suitable personal protective equipment such as suitable safety shoes when handling gas cylinders.
- Perform regular inspections on the integrity of the gas cylinder by a competent person.
- Securely install valve protection devices when the cylinder is not in use, such as caps or guards. Ensure that the cylinder is plugged with a safety pin when manoeuvring, transporting and maintaining the cylinder (refer to **Diagram A** below).
- The hard cap provided should be fixed to prevent volatile discharge when the cylinder falls.
- All cylinders are to be stored properly or in designated areas which are well-ventilated and dry, away from electrical circuits and ignition sources, and in an upright position with individually rigid chains or outer physical protection.
- When moving cylinders, avoid rolling or dragging them. Use the appropriate mechanical handling device (refer to the **Diagram B** below). Secure cylinders upright to a proper hand truck or cylinder cart with a restraining strap designed for that specific purpose.
- Restrain the gas cylinders around the main cylinder body at a height that will prevent them from falling over, i.e. 1/2 to 2/3 the height of the cylinder. Do not restrain cylinders around their necks or valves.
- Prevent any cylinders from being dropped or knocked during handling. Avoid impacts to the cylinders caused by contact with other objects such as crashing into other cylinders. Some cylinders (e.g. acetylene) may react violently after being excessively shaken, heated, or knocked.
- Transporters, Distributors, Suppliers and Operators who manage pressurised cylinders should acquire a Safe Operating Procedure (SOP).
- A warning sign should be displayed, and its precautions be made available to the public by all operators.
- Read, understand, and follow the markings and the Safety Data Sheet (SDS) on the cylinder, and the label(s) on the cylinder to avoid misuse.
- Operate the cylinder according to the manufacturer's instruction manual.
- Always switch off the cylinders if not in use.
- Practice good housekeeping and ensure the work area is clean and tidy.
- To conduct risk assessment associated with handling gas cylinders and establish appropriate safety measures, safe working procedures and specific emergency response procedures as well as evacuation plans.

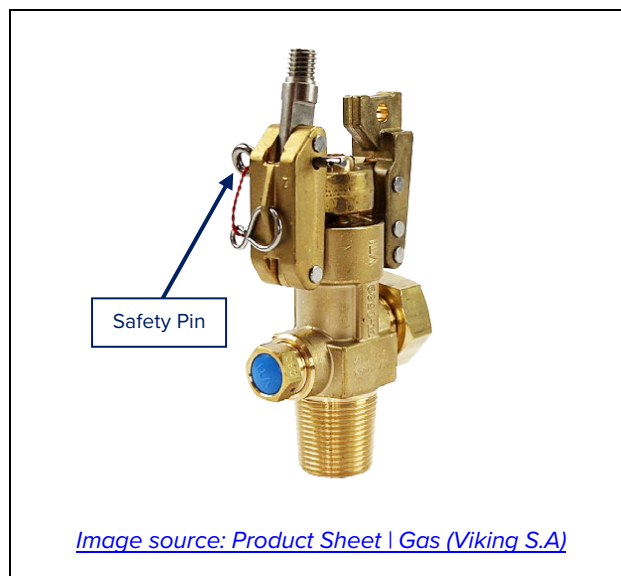


Diagram A



Diagram B

All principals, employers, occupiers, self-employed persons, and persons at work are hereby reminded to comply at all times with the Workplace Safety and Health Order, 2009 and its regulations. The law ensures that those who create the risk are to reduce those risks to persons (employees and public), assets and the environment, to As Low As is Reasonably Practicable (ALARP).

For further clarifications on the matter, please submit your questions via the “General Enquiries” on the SHENA website: www.shena.gov.bn or contact the SHENA office on the general number +673 238 2000 at any time during office hours.

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