

Working with Compressed Gases

1. Overview

1.1 UWS uses a range of products delivered in gas cylinders that are designed and constructed to Australian Standards. To obtain more information about how to store and use gas cylinders in a safe manner all persons working with gas cylinders should familiarize themselves with:

- *AS 4332 The storage and handling of gases in cylinders*
- [UWS Laboratory Safety Guidelines](http://www.uws.edu.au/ohs/ohs/labsafety#1) (section 11) at <http://www.uws.edu.au/ohs/ohs/labsafety#1>
- WorkCover NSW Code of Practice *Storage and Handling Dangerous Goods* (section 10.3)

1.2 Compressed gases are classified as Class 2 dangerous goods (DG), and are further subdivided as follows:

- Class 2.1 - Flammable gas
- Class 2.2 - Non-flammable and non-toxic gas
- Class 2.3 - Toxic gas

2. Potential Hazards

2.1 Potential hazards associated with the use of compressed gas include:

- a build-up of pressure in the cylinder which may lead to it rupturing and causing an explosion or fire
- a gas leak from the cylinder which may lead to an increased fire risk or the release of toxic fumes into the workplace
- flammability (Class 2.1). These gases burn or explode when mixed with oxygen, air or other oxidising gases and are then ignited
- Toxicity (Class 2.3). These gases may be inhaled or absorbed through the skin and cause an adverse reaction in those exposed
- asphyxiation when a gas displaces atmospheric oxygen

2.2 Used or 'empty' cylinders should be treated with the same precautions as 'full' cylinders as residual hazards remain.

3. Identification of contents

3.1 Gas cylinders should be clearly labelled with:

- identity of the contents
- grade or purity
- UN (United Nations) number
- DG diamond
- summary of main hazards and safety instructions

4. Safe storage

4.1 Storage facilities should comply with *AS 4332 The storage and handling of gases in cylinders* and WorkCover NSW Code of Practice *Storage and handling of dangerous goods*.

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- 4.2 Storage areas must be well ventilated.
- 4.3 Cylinders must be segregated in the storage area according to:
 - dangerous goods subclass e.g. flammable, toxic
 - content (full or empty). Clearly identify empty cylinders.
- 4.4 Minimise the number of gas cylinders in indoor locations. Where possible, gases should be stored outdoors and piped into laboratory areas.
- 4.5 Secure cylinders from falling with an appropriate device while in use, storage or transport.
- 4.6 Store cylinders upright and away from direct sources of heat. Minimise fire risks by keeping the area clear of combustible material and protect cylinders from potential impact damage.
- 4.7 Storage areas must be provided with emergency equipment (e.g. fire extinguisher, breathing apparatus, water supply, fire hose reel, suitable personal protective equipment as appropriate).

5. Safe use and handling

- 5.1 Ensure that the current Material Safety Data Sheet (MSDS) is available and well understood.
- 5.2 Trolleys or other suitable devices should always be used to transport cylinders, even for short distances.
- 5.3 Ensure that the appropriate personal protective equipment (PPE) is worn e.g. stout gloves, protective footwear, safety glasses.
- 5.4 Be aware of manual handling issues when moving cylinder e.g. trapping fingers between cylinders, use of correct lifting posture.
- 5.5 Ensure that emergency management equipment is serviceable, regularly tested and maintained e.g. fire extinguishers, breathing apparatus, absorption material.
- 5.6 All equipment should be compatible with the gas being used.
- 5.7 Equipment used when handling flammable gases must be earthed, flameproof, and free from ignition sources.
- 5.8 Keep supplied valve protection caps in place when the cylinder is not being filled or not connected for use.
- 5.9 Keep cylinder valve securely closed when not in use (unless connected to a device by permanent piping).
- 5.10 Precautions should be taken to prevent backflow of contaminants into the cylinder. Do not use a cylinder that has become contaminated.
- 5.11 Use cylinders on a first-in-first-out (FIFO) basis.
- 5.12 Protect cylinders from any source of direct heat.

6. Dealing with leaks and emergencies

- 6.1 Procedures must be developed to deal with leaks and emergencies, taking into account potential hazards associated with working with gases. Personnel must be trained in such procedures and the use of emergency equipment.

7. Personnel

- 7.1 All personnel using compressed gases must be trained in the:
- proper identification of gas cylinder contents and their hazards
 - safe operation and use of safety and emergency equipment
 - safe handling and use of the gas cylinder and its valve
 - correct operation of gas flow
 - emergency management procedures

8. Inspections, testing and maintenance

- 8.1 Gas cylinders must be inspected and tested in accordance with AS 2030.
- 8.2 Equipment used with gases should be regularly inspected for signs of leakage or damage.

14. Further Information

- 14.1 Please contact the [OHS&IS](#) unit if you require further information.