**SAFE WORK PROCEDURE**

**Faculty/School:** Faculty of Pharmacy  
**Initial Issue Date:** Sep 2009  
**Next Review Date:** Oct 2017  
**SWP Reference Number:** Version: 5  
**Version Issue Date:** Oct 2016

**SWP Title:** Working with Gases  
**Description:** This procedure is applied when gas cylinders are in use

**Prepared by:** Dr Sarah Cui, Padmaja Dhanvate and Dr Alpesh Patel

**Responsible supervisor/s:** Research Supervisors, Lab Managers, Facility Officer, Technical Officers

### List the Hazards and risk controls as per risk assessment

<table>
<thead>
<tr>
<th>Associated risk assessment reference</th>
<th>Hazards</th>
<th>Risk controls</th>
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<td>1. Gas leaks, that may cause an explosion or major fire or asphyxia</td>
<td>1. Gas regulators are regularly tested. Monitors for oxygen depletion, flammable and toxic gases are installed in labs where He, CO₂ and Acetylene gases are in use</td>
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<td>2. Physical injury</td>
<td>2. Proper training is required, follow MSDSs</td>
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### List resources required including personal protective clothing, chemicals and equipment needed

1. Proper enclosed footwear  
2. Lab coat if working in a laboratory area  
3. Hair tied back, if long.  
4. Trolley for transporting cylinders  
5. Chains for restraints of cylinders

### List step by step instructions or order for undertaking the task

The guidelines are summarised from University of Sydney WHS guidelines for usage of compressed gases. The key requirements are:

- **Restraints for Gas Cylinders:** all compressed gas cylinders be properly restrained, whether in use, being stored or being transported - this includes "empty" cylinders. Cylinders being stored or in use will be secured to a fixed structure. Do not restrain cylinders around their necks - restrain them around the main cylinder body at a height that will prevent them from falling over. Use racks and chains/straps, trolley stands with chains/straps or proprietary products designed for the purpose (e.g. "Bottlechock").

- **Storage:** where possible, cylinders be stored in, and used from secure locations outside of buildings.

- **Minimum quantities:** only minimum practical quantities of compressed gases be kept and used inside buildings.

- **New standards:** proposals for new equipment using compressed gases incorporate plans for safe and secure gas supplies in line with the University's long-term aims to house cylinders outside of buildings.

In Faculty of Pharmacy, the following procedures should be followed:

I. **Order and transport gas cylinders**

- Full and empty cylinders are not stored in labs, only "in use" cylinders are held in the lab, only the minimum possible number. "In use" is defined as 'being connected to equipment or the cylinder has a regulator
mounted’.  
• Contact Facility Officer at pharmacy.facilities@sydney.edu.au 24 hours in advance (between 7.30-4pm) to arrange gas cylinder orders and deliveries.

II. Storage of cylinders
• Cylinders MUST always be secured  
• Keep all cylinders away from heat sources.  
• Do not store cylinders near combustible materials or flammable liquids.  
• Keep flammable (Acetylene, LPG in S226) gases away from any source of ignition (NB: any electrical switch or device is an ignition source)  
• Keep cylinders in well-drained areas, out of water pools.  
• Cylinder storage areas should be kept clean.  
• Cylinder storage areas should be well ventilated.  
• Storage areas should be level and have good access for trolleys.  
• Storage areas should be secured to prevent unauthorised entry.  
• Different types of gas must be stored separately in accordance with regulations  
• Stores must have clear signage in accordance with regulation.  
• Full and Empty cylinders should be stored separately if space permits.  
• Cylinders must be stored upright on a level floor.  
• Cylinders should not be stored in heavy traffic areas.  
• Cylinders should not be stored for a long time, rotate stock.  
• Never obscure cylinder labels.  
• Check regularly for leaks and faults.

III. Handling cylinders
• Cylinders must always be secured to the trolley when being transported and to the wall or bench when being used.  
• Cylinders must be handled carefully and never knocked down or allowed to fall.  
• Cylinder valves must always be closed and all equipment detached when the cylinder is moved however small the distance.  
• Cylinders must never be rolled along the ground.  
• Never open the cylinder valve unless the cylinder is connected to a regulator or to equipment.

IV. Response to alarms
• Alarms to detect oxygen depletion alarms, flammable and toxic gases leak are installed in S245 (Helium), S238A (Helium), S226 (Acetylene), N257A (Carbon dioxide), N423 (Carbon dioxide) and S208 (Carbon dioxide), N265 (Helium and Nitrogen). Immediately leave the room if the alarm sets off in the area or not to enter the room. Notify the technical officers and lab manager about the incidence and notify other members not to enter the room. If it happens after hours, contact Security x13333 or Contact Hosblab on (02) 9816 3555.  
• Gas supply monitors are installed N423, if alarm sets up, notify technical officers who will inform facility officer to change gas cylinders.

V. Maintenance
• Alarms to detect oxygen depletion alarms flammable and toxic gases leak are tested and calibrated by professional contractors every six months.  
• Gas regulators are quarterly tested using Bubble test by facility officer.

List emergency shutdown procedures

In the event of emergency shutdown, keep close the cylinder valve, and leave the room immediately.  
Follow local emergency procedures and approach emergency contacts.

List Emergency procedures for how to deal with fires, spills or exposure to hazardous substances

If gas alarm sets off, leave the room immediately,  
In the event of a fire emergency evaluation, close the valve and leave the room.

List Clean up and waste disposal requirements
1. All incidents are to be reported to your immediate supervisor, university whs officers and medical assistants may be required.
2. Incidents resulting in injury and any near-miss incidents must be reported using the online WHS reporting system.
3. Empty cylinders will be returned to the supplier, it is arranged by facility officer.

List references used in the development of this SWP, e.g. codes of practice

1. University WHS website: sydney.edu.au/whs
2. AS/NZS 2243.1:2005-Safety in Laboratories: Planning and Operational Aspects

List competency required – qualifications, certificates, licensing, training - e.g. course or instruction:

Facility officer and technical officers are helping faculty members on gas delivery and gas regulator testing.

Staff approved to assess competence for this SWP

Facility Officer could give the new members training on this procedure.
In signing this section the assessor agrees that the following persons are competent in following this SWP.

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<th>Signature</th>
<th>Date Competent</th>
<th>Name Assessor/Authoriser</th>
<th>Assessor/Authoriser signature</th>
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