

Risk Assessment: Training in the Transportation, Operation and Storage of Compressed Gas Cylinders

This risk assessment complements the general risk assessment “transportation, operation and storage of compressed gas cylinders”.

Hazards	Who Might be Harmed and How?	Existing Control Measures	Further Actions Required	Responsible Person	Date
Musculoskeletal, crush and impact injuries	<i>Research staff and students taking part in gas cylinder training sessions.</i> Improper manual handling of gas cylinders could result in musculoskeletal injuries e.g. muscle strain and back pain. If a gas cylinder were to fall and strike a user, this could lead to broken bones or blunt-force trauma e.g. bruising. If a cylinder were to fall and damage the main cylinder valve, the sudden uncontrolled release of gas at high pressure could result in the cylinder becoming mobile/projectile causing injury if users were struck by it. The training session necessarily requires inexperienced users to connect a regulator to a gas cylinder. If the trainee does not attach the regulator to the cylinder correctly, the regulator could be ejected at high speed, causing serious impact injuries/blunt-force trauma.	Research staff and students undertaking training will be shown how to use the “churning method” to minimise physical exertion when moving gas cylinders. This will include a discussion of minimising manual cylinder movement through the use of cylinder trolleys. If an individual is deemed physically incapable of safely moving the cylinder this will be identified by the training staff and explained to the trainee. That individual must request that another trained individual carries out the task for them. The training course will highlight that cylinders should be transported between locations by 2 people wherever possible and the route taken should be clear of obstacles. Adopting the approach above will minimise the risk of musculoskeletal injuries during training. Gas cylinders used for training will be placed in cylinder stands to prevent cylinders from falling minimising the risk of	No further actions currently required, but risk assessment subject to regular review.	N.A.	N.A.

		impact injuries, unexpected falls that could result in release of gas from the cylinder, or damage of the cylinder regulator During the training session, the regulator connection will be made by the trainee and subsequently checked by a member of the training staff to ensure a tight connection has been achieved before the main cylinder valve is opened. Cylinder regulators specifically purchased for cylinder training will be used as part of the training and will be inspected before use as an integrated part of the training course. Only regulators within their “replace by” date will be used to limit the risk of component failure. When opening the main cylinder valve, all trainees and training staff will stand on the side of the cylinder perpendicular to the regulator connection so if it is ejected it will not strike an individual. Warning tape will be used to demarcate the floor area behind which trainees should stand to ensure all personnel are correctly positioned before the cylinder valve is opened. Attendees and training staff will wear safety glasses throughout the course to protect their eyes in the event of projectile hazards.			
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Hazards	Who Might be Harmed and How?	Existing Control Measures	Further Actions Required	Responsible Person	Date
Uncontrolled release of cylinder contents	<i>Staff, students or visitors in the vicinity of a compressed gas cylinder.</i> An uncontrolled release of gas from the cylinder could place trainees and training staff at risk. The training session necessarily requires inexperienced users to connect a regulator to a gas cylinder. If the trainee does not attach the regulator to the cylinder correctly, the regulator could be ejected resulting in complete, uncontrolled release of a full nitrogen cylinder leading to oxygen depletion and a risk of asphyxiation.	Only nitrogen and compressed air will be used for training purposes to eliminate any fire / explosion, toxicity or corrosive hazards associated with other commonly used lab gases (e.g. hydrogen, carbon monoxide and hydrochloric acid) Staff and students attending the training will be shown how to complete a leak-test to prevent uncontrolled releases of gas in their work environment. The training will be conducted in a large space such that asphyxiation is unlikely to occur in the event of an accidental release of nitrogen. If a full cylinder vents into the training space, the immediate area will be evacuated and left to allow the nitrogen to naturally dissipate. Oxygen levels will be assessed with a handheld gas monitor to determine if the area is clear to reoccupy.	No further actions currently required, but risk assessment subject to regular review.	N.A.	N.A.

Training Requirements:

This risk assessment covers general training on the use of gas cylinder regulators. This will complement laboratory-specific instructions provided by individual research groups. Whilst “cascade training” (training by senior members of research groups to less experienced members) is acceptable, training at a departmental level helps reinforce best practice and ensure a level of consistency regarding gas cylinder training.

Specialised Emergency Response (if required):

Impact injuries: If a cylinder falls or a regulator is ejected and strikes a trainee, the injured party will be given immediate First Aid before being taken to the Medical Centre / Hospital or, if necessary, calling an ambulance. If a cylinder falls and does not cause an injury, training staff will assess the situation and, if safe to do so, lift the cylinder back into position.

Gas Leaks: In the event of a major leak of asphyxiant gas, the training area will be evacuated.

Version Control:

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1.0	Original Document	Published	Kevin Jones, Chemistry	30/06/2026