Porton Science Park Gas Safety Risk Assessment – May 2023 Operation of Compressed Gas Cylinders in the Gas Store

The information contained in this document is offered to PSP's lab operators as a guide and aims to assist with identifying potential hazards and risks within the gas store.

However, the document cannot cover all potential hazards and risks within specific working environments for PSP's lab operators for which this responsibility is therefore conferred to PSP's respective lab operators.

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Working Environment

-		Yes	No	Comments
1	Have risk assessments been completed on the use of gas cylinders in the workplace?			
2	Are standard operating procedures in place covering the assembly and safe use of gas cylinders and associated equipment in the workplace?			

3	Have all operators been trained in the appropriate standard operating procedures?		
4	Are the users of gas cylinders and equipment adequately trained with respect to gas properties and hazards?		
5	Are all locations where gas cylinders are used clearly identified with appropriate signage?		
6	Is the working environment clean, free from oils, greases, and flammable materials?		
7	Are Safety Data Sheets available for all gases within the work area? If yes, are they readily available to all operators, and fully understood?		
8	Are all cylinders upright and secured?		
9	Are cylinders correctly labelled and colour coded?		
10	Are appropriately sized trolleys fitted with chains/straps provided to move cylinders in and out of the work area?		
11	Are spindle keys available for all top outlet cylinders within the work area?		
12	Are the correct tools on hand to fit regulators and other control equipment? (Not adjustable spanners)		

13	Is an appropriate leak testing solution available and used by operators each time prior to use?		
14	Are all staff equipped with appropriate PPE and trained in its use? (Eye protection, gloves, and safety footwear		
15	Are all staff trained in correctly assembling the gas system, opening the cylinder valves, setting the appropriate pressure or flow, leak testing the system and shutting the system down?		
16	Are the correct operating procedures (e.g., start-up and shutdown) followed by the operator(s)?		
17	Is adequate ventilation available in all work areas?		
18	Is firefighting equipment available in the work area and are all personnel trained in its use?		
19	Are there clearly established emergency evacuation procedures, which are updated and practised on a regular basis?		
20	Are all staff able to identify pipeline isolation valves and do they know how to operate them in an emergency situation?		
21	Are all areas where gas cylinders are used or stored designated as no smoking and clearly marked as such?		

22	Is all gas control equipment kept in a clean, secure area?		
23	Is all damaged or defective equipment replaced immediately?		

Oxy-fuel Gas Systems - Pressure Regulators

		Yes	No	Comments
1	• Are the regulators free from any signs of heat or mechanical damage, contamination, PTFE tape or jointing compound(s) on either of the inlet threads?			
2	Are the pressure adjusting screws captive on the regulator?			
3	Are the regulators labelled correctly with: a. name of the gas b. maximum inlet pressure c. maximum outlet pressure d. BS EN number e. manufacturer/supplier's name or logo			
4	Are the correct regulators being used for the gases and pressures contained within the cylinders?			
5	Are all regulators in date (usually 5 years) and not overdue (the manufacturer's recommended) scheduled replacement?			

Safety Devices, Hoses and Torches

		Yes	No	Comments
1	Are safety devices, flashback arrestors and hose check valves fitted to both oxygen and fuel gas systems?			
2	Are the safety devices undamaged, free from contamination, PTFE tape or other jointing compounds?			
3	Are hoses coiled or wrapped around cylinders whilst the equipment is in use? Hoses must be fully extended when in use			
4	Are the hoses labelled and correctly colour coded for the gases being used? Red Acetylene Orange Propane Blue Oxygen			
5	Are the hoses fitted with the correct connections (i.e. not worm drive screws)			
6	Are there any joints in the hose(s)? (Any hoses which have been repaired or joined must be re-tested before use to EN 560?			

7	Is the torch or blowpipe in good condition (i.e. free from heat and mechanical damage, contamination etc) and suitable for the work in hand?		
8	Is the torch fitted with the correct nozzle?		
9	Is the manufacturer's nozzle data chart available for use?		
10	Are operators lighting oxy-fuel gas systems with the correct spark lighters?		
11	Are operators purging the oxy-fuel gas system prior to lighting the torch?		
12	Do operators understand the correct shut-down procedure to be undertaken in the event of a flashback?		
13	Are operators shutting systems down correctly at the end of the work period and safely de-pressurising the system?		
14	Is firefighting equipment available in the work area and are all personnel trained in its use?		

Safe Handling of Gas Cylinders

		Yes	No	Comments		
1	Are all personnel aware of the hazards associated with the handling of gas cylinders?					
2	Are all personnel who handle or move gas cylinders properly trained in all relevant aspects of the Manual Handling Operations Regulations 1992?					
3	Have all operators been issued with (and wear) appropriate personal protective equipment?					
4	Are appropriately sized, designed and constructed cylinder trolleys available for staff use?					
5	Are cylinder trolleys regularly and adequately maintained?					
6	If trolleys are not available, have all personnel been practically trained in the milk-churning of cylinders and is a record kept of this training?					
7	Have all cylinder handling operations been risk assessed with reference to: The task?					

	The load? The working environment? The individual's capability?			
8	On this basis, has the employer formulated and made suitable conclusions and recommendations?			
9	Are these handling assessments reviewed regularly?			
Safe	Storage of Gas Cylinders - External Gas Cylinder Storage	e (pref	erred	at PSP)
		Yes	No	Comments
1	Has a risk assessment been completed with regard to the gas cylinder store and surrounding area?			
2	Is the cylinder storage area well defined?			
3	Is the store located to reduce manual handling distances to a minimum?			
4	Is the storage area above ground level and in the open air?			
5				

6	Has the storage area some protection from the weather?		
7	Is the storage area free from other stored materials, especially flammable substances?		
8	Is the store located with due regard to the seepage of heavier than air gases into low lying areas such as basements, trenches, drains, ducts and pits?		
9	Is the storage area sufficiently remote from ventilation inlets, building doors or windows, boundaries or other stored combustible materials?		
10	Does the storage area have a well-drained, even, non-combustible and non-porous floor laid to a fall?		
11	Is the store area floor free from standing water?		
12	Does the storage area have good vehicular access?		
13	Does the storage area have good pedestrian access for staff returning or collecting cylinders on trolleys?		
14	Does the store have adequate racking facilities for small cylinders?		

15	Does the store have proper means to keep large cylinders upright and individually secured?		
16	Is the store equipped with a means of escape?		
17	Is the storage area adequately lit?		
18	Does the storage area have protection from vehicle impact such as crash barriers?		
19	Is the store designated a NO SMOKING AREA?		
20	Are toxic gases kept in a ventilated, locked enclosure with access restricted to authorised and trained personnel?		

Internal Gas Cylinder Storage

Please note: the storage of cylinders within buildings should be avoided wherever possible. However, when it is the only practical solution, the following points should be considered.

		Yes	No	Comments
1	Is the internal storage area constructed from fire resistant material?			

2	Does the internal storage area have at least one wall made from open mesh?		
3	Is the internal storage area equipped with forced ventilation that will take leaked gases outside to a safe place?		
4	Is the internal storage area free from other stored materials, especially flammable substances?		
5	Is the internal storage area sufficiently remote from drains, basement entrances, ventilation inlets, building doors, windows, boundaries or other stored combustible materials?		
6	Does the internal storage area have good pedestrian access for staff returning or collecting cylinders on trolleys?		
7	Does the internal store have adequate racking facilities for small cylinders?		
8	Does the internal store have proper means to keep large cylinders upright and individually secured?		
9	Is the internal store equipped with a means of escape?		

10	Is the internal storage area adequately lit?			
11	Are the number of cylinders in the internal storage area kept to an absolute minimum?			
12	Is the store designated a NO SMOKING AREA?			
Exter	nal and Internal Gas Cylinder Storage			
		Yes	No	Comments
1	Are all gas cylinders checked for correct labelling, damage and so forth at the time of delivery?			
2	Is the storage area kept secure?			
3	Is the storage area correctly identified with appropriate signage?			
4	Is stock checked for pilferage?			
5	Is the store managed so that nominally empty cylinders are returned as soon as practicable to the supplier?			
6	Are the number of cylinders within the store kept to an absolute minimum?			

7	Does the storage area have a means to segregate cylinders into the recommended categories, by status and type?		
8	Is the storage area kept clean and free from combustible materials?		
9	Is the storage area equipped with the appropriate number and types of fire extinguishers, in a readily available position and close to exits?		
10	Does the storage area have a means of protecting carbon dioxide and LPG cylinders from direct sunlight?		
11	Is the storage area at least 3 metres away from any ignition source?		

Emergency Procedures, Training and Provision of Information

Are all staff who access the gas store fully trained with particular regard to:

		Yes	No	Comments
1	Potential hazards of the gases within the store?			
2	How to move cylinders safely?			
3	The emergency procedures associated with the gases kept in the store.			

	Are you in a position to give the emergency services the following information in case of an incident: a. types of gases involved? b. cylinder quantities and types? c. where they are located?		
4	Is there an emergency plan posted at the point of storage along with appropriate emergency telephone numbers? (e.g. gas supplier, location of keys, stores contents inventory, etc.) Your emergency plan should contain the following: • how to raise the alarm • evacuation route and procedures • safe assembly points • actions to deal with leakage • actions with toxic cylinders and use of breathing apparatus • fire drills • selection of a knowledgeable person to assist the emergency services • notifying the supplier when cylinders are involved in incidents This information would be required by the Fire & Rescue Service		
5	Is there a planned and recorded procedure for access to the store in the event of an emergency?		
6	Are all exits clearly marked?		
7	Are all lab operator staff who access the gas store fully trained in the use of emergency equipment?		

8	Are all items of emergency equipment adequately inspected, tested and maintained?		
9	Are relevant data sheets available to stores personnel?		

Safe Operation of Fixed Systems

		Yes	No	Comments
1	Does the system undergo periodic inspection and maintenance in accordance with a Written Scheme of Examination?			
2	Are those parts of the system(s) which are subject to periodic replacement identified?			
3	Have standard operating procedures been produced for each system? If yes, are the procedures posted near to the system and have operators been trained correctly?			
4	Is the equipment in good order and being used correctly?			
5	Are the correct, undamaged regulators being used for the pressures and gases in use?			
6	Do the flexible hoses and pigtails show any signs of corrosion or damage?			

7	Are all valves suitably labelled?		
8	Is the pipework adequately supported?		
9	Are the cylinders adequately secured?		
10	Are there any nominally empty cylinders in the area? If yes, they should be removed to the cylinder store. The area should not be used as a general cylinder store.		
11	Is the area being used as a storeroom?		
12	Is there suitable and readily available fire fighting equipment in the area? If yes, are operators correctly trained in its use?		
13	Is the area clean and free from combustible materials (including oils and greases), sources of heat and ignition etc		
14	Are the correct tools for changeover and leak detection provided?		
15	Are all connections regularly leak tested with an approved leak detection solution?		

Emergencies Procedure

		Yes	No	Comments
1	Is there a published emergency response plan?			
2	If so, is this regularly practised?			
3	Does this plan take into account all potential hazards and all safety and legal requirements which relate to: a. the gases? b. other materials? c. processes? d. equipment?			
4	Does the plan have the safety of staff as its primary emphasis?			
5	Does the plan consider the following: a. alarms b. site evacuation and roll call c. consultation with emergency services d. safe emergency shutdown of equipment e. possible effects on neighbours f. provision, location and checks on emergency equipment g. site plans and muster points h. inventory of all gases kept on site i. out of hours emergency situations			

	j. formal training of an emergency response team		
6	Have emergencies of the following types been considered in this planning: a. fire? b. gas leakage? c. flashbacks? d. burns and/or physical contact with gases?		