Safety Documentation

Please select the forms you require by selecting the check boxes below.
You can select more than one.

☑ **Risk Assessment** ☑ **Method Statement** ☑ **Chemicals COSHH**

Once you have made your selections, scroll down and complete the forms.

Buttons: [+] will add a row to a list [X] will delete a row from a list

You may save this file to a local drive at any time.
When you have finished, save the file to a local drive and email it to your supervisor for authorisation.

Supervisors - There is a sign-off section at the end of the document set that must be completed.

Staff may "self authorise", (as a supervisor), but the forms must still be submitted to the DSO for approval.

IMPORTANT:

YOU ***MUST NOT*** START ANY PRACTICAL WORK UNTIL THESE FORMS HAVE BEEN RETURNED TO YOU WITH **BOTH** YOUR SUPERVISOR's AND DSO's APPROVAL SIGNATURES ATTACHED.

Please complete these fields

School or Service	Wolfson School of Mechanical, Electrical and Manufacturing Engineering
Department	Centre for Biological Engineering
Originator name	Carolyn Kavanagh
email address	c.l.kavanagh@lboro.ac.uk
Location	Centre for Biological Engineering (Outside storage Gas Pod 2 and 3 - gas
Project / Activity / Task	Exchange of Gas Cylinders and Use of the Gas Cylinder Change over System (Oxygen, (size L) Nitrogen (size L) and Co2 Cylinders (size LK)- gas piped in)
Supervisor Name	Mark Taylor

Version : 2.19

Loughborough University
Centre for Biological Engineering

Risk Assessment

Reference: SAF/MM6408

Location: Centre for Biological Engineering (Outside storage G

Originator: Carolyn Kavanagh

Project / Activity / Task: Exchange of Gas Cylinders and Use of the Gas Cylinder Change over System (Oxygen, (size L) Nitrogen (size L) and Co2 Cylinders (size LK)- gas piped in)

Is this process risk assessment for a : ○ Laboratory / Workshop ☑ General use

Category 1: Workplace	+
Storage and Stacking	x
Falling/moving objects/materials	x
Category 2: Hazardous and/or Harmful substances	+
Substances under high pressure	x
	x
Category 3: Activity	+
Awkward/Heavy lifting/Handling	x
Category 4: Organisation	+
	x

Explain the risks associated with these hazards

People / Groups at risk: Operator only — x

Enter risk details here:-	Impact	Probability	Risk Score
Risk of Injury from churning cylinders	Harmful	Likely	High

What are the control measures?	Lowers Impact	Lowers Probability	+
Laboratory users are trained how to churn cylinders correctly and dangers of cylinders. Cylinders only churned short distances. Longer distances requires the use of a trolley.	Significantly	Significantly	x

Residual Risk: Low

People / Groups at risk: Operator and people in proximity — x

Enter risk details here:-	Impact	Probability	Risk Score
Risk of injury from cylinder falling to ground	Harmful	Unlikely	Medium

What are the control measures?	Lowers Impact	Lowers Probability	+
All Cylinders are clamped securely to ensure they do not fall	Significantly	Significantly	x
Authorised trained staff only work with the cylinders . Caps are not removed until cylinder ready to be used.	Significantly	Significantly	x

Residual Risk: Low

Process Risk Assessment Form (Continued)

People / Groups at risk	Operator and people in proximity		x
Enter risk details here:-	Impact	Probability	Risk Score
Leakage of oxygen gas causing enriched atmosphere	Harmful	Likely	High
What are the control measures?	Lowers Impact	Lowers Probability	+
Cylinders stored in secure ventilated outdoor location segregated where required.	Significantly	Significantly	x
Authorised staff trained to check /listen for leaks and report issues. Taps are shut off if leak detected.	Significantly	Significantly	x
Authorised staff ensure that cylinders are free of oil or grease that may lead to explosion.	Significantly	Significantly	x
		Residual Risk	
		Low	

People / Groups at risk	Operator and people in proximity		x
Enter risk details here:-	Impact	Probability	Risk Score
Gas Cylinders explosion in high temps (fire)	Harmful	Highly Unlikely	Low
What are the control measures?	Lowers Impact	Lowers Probability	+
Cylinders stored in ventilated outdoor location segregated where required	Significantly	Significantly	x
Smoking and naked flames are prohibited nearby (signage on Gas Pod).	Significantly	Significantly	x
		Residual Risk	
		Low	

People / Groups at risk	Operator and people in proximity		x
Enter risk details here:-	Impact	Probability	Risk Score
Release of gas if damage to valve	Harmful	Unlikely	Medium
What are the control measures?	Lowers Impact	Lowers Probability	+
Cylinders stored in ventilated outdoor location segregated where required	Significantly	Significantly	x
Authorised staff wear safety glasses to protect eyes from accidental release of gas	Significantly	Significantly	x
Staff trained to report any concerns and not use anything that looks faulty.	Significantly	Significantly	x
Safety gloves must be worn to protect hands from possible cold if gas is released	Significantly	Significantly	x
		Residual Risk	
		Low	

People / Groups at risk	Operator only		x
Enter risk details here:-	Impact	Probability	Risk Score
Risk of injury from snifting cylinders	Harmful	Likely	High

Process Risk Assessment Form (Continued)

What are the control measures?	Lowers Impact	Lowers Probability	+
Authorised staff are trained how to vent cylinders, Oxygen cylinders should NOT! be snifted.	Significantly	Significantly	x
PPE (Safety Glasses) are worn when snifting	Significantly	Significantly	x
Safety gloves must be worn to prevent dust and debris being forced into skin.	Significantly	Significantly	x

Residual Risk
Low

People / Groups at risk	Operator only	x

Enter risk details here:-	Impact	Probability	Risk Score
Gas leakage due to faulty /in-correct regulator	Slightly Harmful	Likely	Medium

What are the control measures?	Lowers Impact	Lowers Probability	+
Regulators are checked annually and changed every five years	Significantly	Significantly	x
Authorised users are trained to attach regulators correctly and report any concerns. Faulty equipment will not be used.	Significantly	Significantly	x
Gas Cylinders stored in well ventilated outside storage segregated where required.	Significantly	Significantly	x

Residual Risk
Low

People / Groups at risk	Operator only	x

Enter risk details here:-	Impact	Probability	Risk Score
Injury from removal of CO2 heater to allow exchange	Harmful	Highly Unlikely	Low

What are the control measures?	Lowers Impact	Lowers Probability	+
Authorised users are trained to remove CO2 heater safely	Significantly	Significantly	x
PPE worn - Safety glasses and safety gloves	Significantly	Significantly	x
CO2 Heaters are PAT tested for electrical safety every 2 years.	Significantly	Significantly	x

Residual Risk
Low

+ Add another Risk

With these controls in place, the risk is:

The activity is LOW RISK - and is effectively controlled

Loughborough University
Centre for Biological Engineering

Safety Method Statement

Reference: SAF/MM6408

Location	Centre for Biological Engineering (Outside storage Gas	Originator	Carolyn Kavanagh
Project / Activity / Task	Exchange of Gas Cylinders and Use of the Gas Cylinder Change over System (Oxygen, (size L) Nitrogen (size L) and Co2 Cylinders (size LK)- gas piped in)		

What equipment will be used in this activity?	+
Co2 Heaters to prevent pipes freezing.	x
Gas Cylinders	x
Spanner	x
Gas Bottle Trolley	x

What training must be completed to do this activity?	+
Gas cylinder handling training	x

What chemicals are being used? (These must be included in the COSHH Form)	+
Oxygen, Nitrogen and Carbon Dioxide	x

Spill and accident procedures.	+
SOP038 Spill Response details spill procedures . Accidents are reported through University online system	x

Procedure in the event of an emergency. (How to leave the process in a safe condition in such an event)	+
Leave cylinders securely tied with dust cap on or regulator attached securely to prevent leaks. Fire brigade to be informed of location of cylinders and any issues.	x

References.	+
SOP058 Safe use of Compressed Gases	x

Detailed sequential description of the process

Process step	Precautionary measures and comments	+

Safety Method Statement (Continued)

Process step	Precautionary measures and comments	+
Check the direction the arrow is pointing, it points to the cylinder that requires changing. Confirm this by checking the position of the regulator A1 or B1 needle; the regulator of the empty cylinder should be < 10 bar. (If not contact Responsible Person(RP)/ Laboratory Manager (LM) immediately as this indicates a false alarm and the system is not operating correctly) Step 2 Confirm other cylinder is full, by checking regulator of opposite cylinder (either A1 or B1) is reading >40 bar. If so, pull down or push up lever to switch feed to full cylinder, action depends on whether the right (push up) or left (pull down) cylinder has expired. The next steps depend on the cylinder being changed, cylinder on the left follow “A” commands or the right cylinder follow “B” commands Step 3 Close Valve A2 or B2 turning clockwise. Step 4 On wall behind cylinders (right of gas bank), switch off power to heater, (co2 only) each heater is numbered, double check number on heater corresponds to wall switch. Step 5 Close valve A3 or B3 on cylinder A or B, turning clockwise Step 6 Open valve A4 or B4 to purge line, close immediately, once line empty. Step 7 Using wrench (pull towards yourself) to loosen the bolt A5 or B5, attaching the gas line to the cylinder and remove. Step 8 Release cylinder from clamp, slightly tilt cylinder and churn cylinder to another location, clamp to secure. Using chalk, write “empty” and initial and date on the cylinder. Note the last 5 digits of the serial number of the empty cylinder. Step 9 Select a new cylinder, remove grey dust cap from valve, inspect valve for any signs of damage (if any damage noted, write “do not use”, clearly on cylinder and report to RP/LM), release new cylinder and churn to gas bank, ensure to position the cylinder so that the valve (A5 or B5) faces to the right, secure using clamp tie. Note the last 5 digits of the serial number of the full cylinder to be fitted. Email these numbers along with the date and time to Eleri (e.a.bristow@lboro.ac.uk) for stock tracking. Fill in the cylinder change tracking sheet in the CBE main corridor outside of first change. Step 10 Using fingers connect gas line to valve A5 or B5, tighten bolt with wrench. Step 11 Switch power to heater back on Step 12 Open valve A3 or B3 on cylinder, turning anti-clockwise. Step 13 Open Valve A2 or B2 turning anti-clockwise Step 14 Double check both regulators A1 and B1, both regulators should be reading >40 bar. (If not, double check that valve A3 or B3 and A2 or B2 are open, if so contact LM/RP immediately).Check guage on cylinder to see if cylinder empty. Close the tap. Please see attached diagram for supporting evidence	Use PPE. Safety Glasses and gloves Closed toe shoes Place heater carefully on shelf when not attached to avoid damage Ensure Cylinders are secure with clamps Check cylinders and guages for damage Check heaters are in good working condition and PAT tested. Replace if required. Wear PPE when removing/ attaching them.	x

		x

Loughborough University
Centre for Biological Engineering

COSHH Form

Reference: MEME538

Location: Centre for Biological Engineering (Outside storage Gas

Originator: Carolyn Kavanagh

Project / Activity / Task: Exchange of Gas Cylinders and Use of the Gas Cylinder Change over System (Oxygen, (size L) Nitrogen (size L) and Co2 Cylinders (size LK)- gas piped in)

CHEMICAL NAME

Oxygen

CAS No. 7782-44-7

W.E.L. (Itel / stel)

Hazard Rating: High

Amount used		Period of use (hrs)	The process is:	Physical State	Exposure Potential
84	kg	24	Closed	Gas	Low

Eyes ☐ Skin ☐ Inhaled ☐ Ingested ☐

OVERALL RISK: Low

Hazard Statement and Description	Precaution Statement and Description
H270 May cause or intensify fire; oxidizer.	P220 Keep/Store away from clothing/…/combustible materials.
H280 Contains gas under pressure; may explode if heated.	P370 + P376 In case of fire: Stop leak if safe to do so.
	P244 Keep reduction valves free from grease and oil.
	P403 Store in a well-ventilated place.

How will the precautions listed above be implemented?

Cylinders are stored in well ventilated areas away from heat sources. Valves are checked for grease and oil before use. Oxygen tap only switched on when in use (infrequent). Staff trained to identify and deal with leaks. If leak detected gas tap will be closed until leak has been dealt with. Leak testing spray can be used to locate leaks.

Special Storage and Containment Measures	Disposal Method
Stored in Gas Pod 2 and 3 in well ventilated area	Cylinder returned to supplier (BOC) when empty
How will spillages be dealt with?	*Please note: any material used to clean up a spill of hazardous material must also be disposed of as hazardous material.* *Click here to see spill procedures*

Turn off any valves, contain at source. Evacuate and contact safety officer.

CHEMICAL NAME

Nitrogen

CAS No. 7727-37-9

W.E.L. (Itel / stel)

Hazard Rating: High

Amount used		Period of use (hrs)	The process is:	Physical State	Exposure Potential
81	kg	24	Closed	Gas	Low

Eyes ☐ Skin ☐ Inhaled ☐ Ingested ☐

OVERALL RISK: Low

Hazard Statement and Description	Precaution Statement and Description
H280 Contains gas under pressure; may explode if heated.	P403 Store in a well-ventilated place.

How will the precautions listed above be implemented?

Cylinders are stored in well ventilated area away from heat sources

Special Storage and Containment Measures	Disposal Method
Stored in Gas Pod 3 in well ventilated area	Cylinder returned to supplier (BOC) when empty
How will spillages be dealt with?	*Please note: any material used to clean up a spill of hazardous material must also be disposed of as hazardous material.* *Click here to see spill procedures*

Turn off any valves, contain at source. Evacuate the area and seek help from Safety Officer

COSHH Form (Continued)

CHEMICAL NAME

Carbon Dioxide

CAS No. 124-38-9

W.E.L. (Itel / stel) long term 8h

Hazard Rating: High

X

OVERALL RISK: Low

Amount used		Period of use (hrs)	The process is:	Physical State		Exposure Potential
99	kg	24	Closed	Gas	☐ Eyes ☐ Skin ☐ Inhaled ☐ Ingested	Low

Hazard Statement and Description	Precaution Statement and Description	+
H280 Contains gas under pressure; may explode if heated.	P403 Store in a well-ventilated place.	x
How will the precautions listed above be implemented?		
Cylinders are stored in well ventilated area away from heat sources.		
Special Storage and Containment Measures	Disposal Method	+
Stored in Gas Pod 2 and 3 in well ventilated area	Cylinder returned to supplier (BOC) when empty	x
How will spillages be dealt with?	*Please note: any material used to clean up a spill of hazardous material must also be disposed of as hazardous material.* *Click here to see spill procedures*	
Turn off any valves, contain at source. Evacuate the area and seek help from safety officer		

+ Add another chemical

Statement of work (Process to be undertaken)

These gases are piped from their source in the gas pod into the laboratory. When the cylinders (stored in the gas pod) are empty and alarm will sound in the panel in the CBE office. An authorised trained person will respond. The cylinder will be exchanged for a full one. Co2 cylinders have a heater attached to prevent freezing of the pipes. This needs to be removed carefully wearing PPE when exchanging cylinders. Always check for faults that could cause leaks or other safety issues. Full details in the method statement and in SOP058 .

Show Image

Personal protection requirements not covered in the precaution statements above.

Eye protection (safety goggles), closed toe shoes and safety gloves.

Sources of information and references

SOP058 Safe use of Compressed gases

Reference to **existing approved** Risk Assessment

With the current controls, the risk of using these chemicals is: Low

Supervisor to check that the process involving the safe use of these chemicals has been satisfactorily evaluated

Supervisor and Departmental Safety Office (DSO) Sign-off.

Supervisors

Please check the documents above and if you want to approve them:

1) Electronically sign this document
2) Save it to a local drive (You will be prompted to do this)
3) eMail the signed document to the DSO.

DSO

Please review the documents above and if you want to approve them:

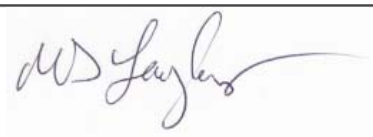
1) Enter the reference numbers as appropriate
2) Electronically sign this document
3) Save it to a local drive (You will be prompted to do this)
3) eMail the signed document to the originator

IF YOU DO NOT WANT TO AUTHORISE THE FORMS,

Please do not sign the form, but click the "Not Approved" check-box and return it to the originator by email stating why and what you expect them to do to put it right in the comments box below.

Not Approved ☐

Supervisors Signature

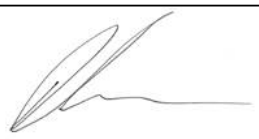


Digitally signed by Mark Taylor
Date: 2020.03.16 15:18:57 Z

Form Reference Numbers

Risk Assessment	Method Statement	COSHH Assessment
SAF/MM6408	SAF/MM6408	MEME538

DSO Signature



Digitally signed by David Green
Date: 2020.03.19 12:29:18 Z
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This document set must be reviewed and re-approved at the following times:

1) After the first occurrence of the activity described above (Review only)
2) After any change to the procedure or reagents used
3) After any incident resulting from this activity
4) At least annually from the date of approval

Next Review:

Review comments