

COSHH Risk Assessment

Newcastle University OHSS: H&S Form 401.1a

This form should be completed electronically and signed by the Principal Investigator or responsible person. Guidance on completing this form is provided in the [COSHH Risk Assessment section of the OHSS website](#).

Section 1: Project Details






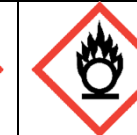

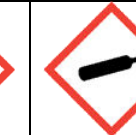
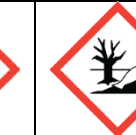
1.1. Title of project or activity	Handling and Storage of Liquid Nitrogen		
1.2. Principal investigator/responsible person	Dr. Arnaud Basle /Dr. Johan Panek		
1.3. School/Institute/Service	Newcastle University – Biosciences Institute		
1.4. Location of work building and room numbers	Cookson Building M3.032, M3.036		
1.5. Brief description of work activity	The following risk assessment and guidance has been developed to assess the hazards, risks related to the handling of liquid nitrogen. It identifies the appropriate prevention and control measures to reduce them.		
1.6. Date of assessment	03/03/2025	1.7. Revision date*	dd/mm/yyyy


Section 2: Emergency Quick Reference



The purpose of this section is to provide easy access to emergency information. A full assessment of risk will be provided in the next sections and

2.1. Emergency contacts One of these should be the PI/responsible person Security can be contacted on extension 6666	Name:	Dr. Arnaud Basle	Dr. Johan Panek
	Position:	Facility Manager	Scientific officer
	Telephone number:	07528960883	07534980476

completing this section last is advisable.

2.2. Hazard pictograms – select all that apply to the work activity.								
								
Health hazard	Toxic	Corrosive	Harmful/Irritant	Flammable	Oxidising	Explosive	Compressed gas	Danger for the environment
X							X	

2.3. Name of hazard	2.4. Properties of hazard Briefly describe how the chemical is hazardous e.g. toxic, flammable, carcinogen	2.5. Emergency procedures	
		Include, as appropriate, procedures for:	
Liquid Nitrogen 	Asphyxiation (H331, H332)	<ul style="list-style-type: none"> Contained Spill Small uncontained spill, Large uncontained spill First aid Fire 	
Liquid Nitrogen	Contains refrigerated gas; May cause severe cryogenic burns	Contained Spill: Allow to evaporate in a well-ventilated area. Small Uncontained Spill: Ensure proper ventilation, keep personnel away. Large Uncontained Spill: Evacuate area, ventilate, and monitor oxygen levels.	
Liquid Nitrogen	Contains refrigerated gas; May cause severe cryogenic burns	Immediately flush thoroughly with copious quantities of tepid water (the water must not be hotter than 44° C). In case of frostbite spray with water. DO NOT apply any form of direct heat. DO NOT rub affected parts either before or after warming. Move the casualty to a warm place (22° C). Arrange for the casualty to be transported to A&E without delay. While waiting for transport:	

2.3. Name of hazard	2.4. Properties of hazard Briefly describe how the chemical is hazardous e.g. toxic, flammable, carcinogen	2.5. Emergency procedures
	or injury (H281, H319)	Include, as appropriate, procedures for: <ul style="list-style-type: none"> • Contained Spill • Small uncontained spill, • Large uncontained spill • First aid • Fire <ul style="list-style-type: none"> • Remove or loosen restrictive clothing. • Continue to flush the affected area with copious quantities of tepid water. • Protect any frozen parts with bulky, dry, sterile dressings. Do not apply to tightly. • Keep patient warm and at rest. • Ensure ambulance crew/hospital is advised of details of accident and first aid treatment already administered. • The casualty should not smoke, nor drink alcohol
Liquid Nitrogen 	Non-flammable, but can cause pressure buildup in sealed containers (H280).	Since liquid nitrogen boils rapidly, users must ensure that it is never used in a closed system. Therefore, do not use thermos flasks or screw-top bottle/containers to store liquid nitrogen, as this presents an explosion risk.

Additional rows can be added to this table as required

Section 3: The Risk Assessment

Additional rows can be added to this table as required

3.1. Name of hazard including substances and by-products produced during or as a result of the activity.	3.2. Properties of hazard Provide details of how the substance could cause harm. Useful sources of information are the safety data sheet for the substance, Hazard (H) statements (give the whole phrase not just the code), and the workplace exposure limit.	3.3. Physical form e.g. powder, dust, granular, pellet, liquid, solution, gas.	3.4. Quantity and concentration (give units)	3.5. Frequency of use e.g. daily, weekly, monthly, one-off.	3.6. Route of exposure e.g. ingestion, inhalation, skin/eye contact, skin absorption, injection/sharps injury.
Health hazard	Evaporates into nitrogen gas, which can displace oxygen and cause asphyxiation in confined spaces.	Liquid/gas	10–250L	Every day	Inhalation
Health hazard	Liquid nitrogen is cold enough to cause severe frostbite upon	Liquid/gas	10–250L	Every day	skin/eye contact

3.7 Carcinogens All carcinogens and users of carcinogens should be notified to OHSS [here](#)

3.8. Dangerous Substances and Explosive Atmospheres (DSEAR)	Yes	No
Are you carrying out an activity/chemical reaction that is at risk of thermal runaway or explosion?		X
Will the activity involve handling or storage of pyrophoric or unstable substances such as peroxide?		X
Will flammable vapours, solid particles, fibrous particles etc. capable of forming an explosive atmosphere be present in the working atmosphere?		X
If the answer to any of the above questions is yes, you will need to complete a short 'add-on' DSEAR risk assessment		

3.9. Who might be at risk? (tick all that apply)	Staff	Postgraduates	Undergraduates	New or expectant mothers (Contact Occupational Health)	Contractors	Public including visitors and children
	X	X				

3.10. Assessment of inherent risk to human health prior to the use of controls (please use the risk assessment matrix at the end of this form)	High	Medium	Medium/low	Low
			X	

Section 4: Controls

Specify for each hazard identified in section 3. Precautionary (P) statements are a useful source of information.	
4.1. Physical or Engineering Controls. LEV, fume hood, glove box, total containment etc. Specify at which point in the work activity they are to be used.	Use of well-ventilated areas, oxygen sensors in enclosed spaces, safety relief valves on storage tanks. A brief list of guidelines is printed on all liquid nitrogen dewars. Protective equipment and clothing are provided. Cryogenic containers are provided
4.2. Administrative controls Training requirements, access control, signage.	All users are internally trained on proper handling of cryogenics. Access control is monitored, and warning signage is displayed
4.3 Personal Protective Equipment. Respirators, safety specs, face mask, lab coat, gloves etc. Specify which type and when they are to be worn.	Googles, face mask, lab coat, Cryoprotectant gloves to be used for every manipulation. Open-toed sandals or closed wellington boots should not be worn, and legs and arms should be covered.
4.4. Storage requirements Include a description of how hazardous substances including flammable materials will be stored. Describe how incompatible materials will be segregated.	Stored in well-ventilated areas in approved Dewars with pressure relief mechanisms.
4.5. Transport of the hazardous substance Describe how you will transport substances between laboratories or different university sites.	Small volumes (<3L) are manipulated/transported be transported in appropriate foam/metal container. Specialized Dewars with pressure relief mechanisms, valve control, proper signage are used for transportation of larger volume (250L)
4.6. Disposal procedures Carefully consider the safest means of disposal and identify when waste should be disposed of by a chemical waste contractor	Excess liquid nitrogen filtered to remove water and returned to storage dewars.

	Yes	No	Describe the findings of exposure monitoring or health surveillance
4.7. Is exposure monitoring required? For example if you suspect that exposure to a chemical exceeds the workplace exposure limit. Contact OHSS for further advice		X	
4.8. Is health surveillance required? See Occupational Health surveillance policy and programme. Contact Occupational Health for further advice		X	

4.9. Assessment of residual risk to human health after the application of controls (please use the risk assessment matrix at the end of this form)	High	Medium	Medium/low	Low

Section 5: Approval

I confirm that this is a suitable and sufficient risk assessment for the above described work activity	Name	Signature	Date
Assessor This is the person who has completed this form	Johan Panek		03/03/2025
Principal Investigator/responsible person	Arnaud Basle		

Risk estimation matrix Use this to complete sections 2.10 and 3.10

Severity of Harm	Likelihood of harm		
	High	Medium	Low
Severe	High	High	Medium
Moderate	High	Medium	Medium/low
Minor	Medium/low	Low	Low

Please keep a record of this risk assessment

***Review of assessment**

This assessment should be reviewed every 2 years and immediately if there is reason to believe that it is no longer valid (e.g. after an accident/incident), if there is a significant change in the work activity to which it relates or if the results of monitoring or health surveillance indicate it to be necessary.