

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 **completing this section last is advisable.**

| | | | | | | | | |
|---|--|--|---|--|---|--|---|---|
| 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 | | | | | |
| 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: <ul style="list-style-type: none"> • Contained Spill • Small uncontained spill, • Large uncontained spill • First aid • Fire |
|---|---|--|
| Liquid Nitrogen  | Asphyxiation (H331, H332) | 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 or injury (H281, H319) | 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: <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 <u>each hazard</u> 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 |
|--|------|--------|------------|-----|
| | | | | X |

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 2.1

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

*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.

Please keep a record of this risk assessment