







Safe Operating Procedure

Title	Liquid Nitrogen (LN2) Facility, Building 82 New Horizons
Issued by	Monash University, Clayton
Application	Who – Persons working in Building 82, New Horizons What – Liquid nitrogen (LN2) Where – LN2 bulk tank, Building 82 New Horizons
Authorisation	Only trained and authorised staff can decant LN2 from the bulk tank
Hazards	Cold burns – splash of liquid (eyes and feet are particularly at risk), contact with pipework Asphyxiation (unlikely in naturally ventilated outdoor storage) – liquid spills causing rapid vaporisation, evaporation from lab dewar and spills Flammability – absorption of airborne oxygen in liquid nitrogen Pressure – faulty pressure valves, ice deposits sealing lab dewar outlet
Personal Protective Equipment (PPE)	 Safety glasses  Faceshield  Cryogenics gloves  Labcoat  Cryogenic apron  Fully-enclosed shoes
Emergency Information	In the event of spilling LN2 onto exposed body, on the face or in the eyes, flush the affected area with copious amounts of water for 15 minutes. Seek emergency assistance for ongoing management.

DEFINITIONS

Dewar – Container with double walls separated by vacuum, used to maintain substances at high or low temperatures

LN2 – Liquid nitrogen; the compressed or liquefied form of nitrogen gas

INSTRUCTIONS

GENERAL

- (a) Liquid nitrogen (LN2) is delivered and stored on site in a bulk tank located external (south side) of the building
- (b) There is a secure gate access to the LN2 filling area – leave the gate open while filling
- (c) There is authorised access for staff and students inducted to this facility
- (d) LN2 is decanted into dewars and taken to labs in the building
- (e) All open dewars must have a lid
- (f) During business hours (8 am - 5 pm, Mon-Fri, excluding public holidays)
- (g) Outside business hours (including weekends), two people must be present.

TRAINING

1. Authorised staff nominated by each department /organisation will carry out practical training.
2. Each department/organisation will be responsible for training their staff and students. If the nominated trainer is not available due to leave etc., then arrangements should be made for other trainers to fill-in.

ACCESS

1. Access to the facility is by swipe card/fob access. To be issued a profile, a copy of the completed induction form, signed by the trainer and Safety Officer, is to be sent to the relevant person in each department/organisation who has authority to request access via Monash Security. Profile issuers are:

Engineering	Ian Wheeler Stelios Konstantinidis
Physics	Robert Seefeld
CSIRO	Bernard Petraitis
PC2 MIME Laboratory	Karla Contreras

2. Under no circumstances are individual's swipe cards/fobs be lent or used by any other person to gain access to the LN2 facility. Monash University "Access to Controlled Areas Policy" applies.

FILLING

1. For Quantities Less Than 5L – Use the 30 L mobile dewar (Appendix Fig. 2)

- (a) Place your dewar below the 30 L mobile decanting dewar – you can use the step to minimise the drop height (Appendix Fig. 1)
- (b) Tip this mobile decanting dewar to fill your dewar
- (c) Be sure to always stand to the side of the fill point
- (d) Place cap back on the 30 L dewar
- (e) If this dewar is empty, use step below to fill the mobile dewar first.

2. Gravity Fill Dewar – Use this for an open top dewar above 5 L (Appendix Fig. 3)

- (a) Place dewar underneath nozzle
- (b) Adjust the height of the nozzle to enter the dewar
- (c) If required, use the step to minimise the drop height
- (d) Open the spring return handle
- (e) Hold handle to continue the flow until full.

3. Closed Bleed Dewar (only used with relevant fittings on the dewars, Appendix Fig. 4)

- (a) Position your dewar and bolt on using the provided “shifter” spanner (located in the filing cabinet)
- (b) Slowly open the main valve and then open the bleed valve. (make sure bleed valve flow is facing away from the standing area)
- (c) Standing back from the dewar operate at the spring return handle and fill to spill – If you have a scale, fill to the required weight
- (d) Once full, release the spring return handle, close the bleed valve and then close off the main valve.

TRANSPORT OF LN2 INTO THE NEW HORIZONS BUILDING

- (a) Minimum PPE – full faceshield, cryogenic gloves, labcoat/apron and fully enclosed shoes
- (b) Access the building via the rear door only – DO NOT use the main entrances
- (c) For lift transportation use – dangerous goods lift to access 1, 2 and 3 must be. DO NOT take the stairs
- (d) DO NOT travel in the lift with LN2
- (e) Take the lift out of DG mode when transport is completed.

TROUBLESHOOTING

If no liquid nitrogen comes out within a minute or so, one of the following problems may have occurred:

- 1. The line is blocked with ice. Wait until the line is free of ice, then retry filling.
- 2. The tank is empty. Report it to the Department Manager.

INCIDENTS

Report all incidents and near-misses immediately to your Supervisor, Department Manager and Safety Officer.

Version 1	Title	Name	Date
Consulted with <i>(group/team/users)</i>	NH Safety Reference Panel	Robert Seefeld Steven Petinakis Stelios Konstantinidis Karla Contreras John Forsythe Nikki Stanford	16/05/2016
Cleared by	Chair, NH Safety Reference Panel	Angelica Vecchio-Sadus	21/07/2016
Approved by	Department Manager Materials Science and Engineering	Ian Wheeler	29/07/2016
Next Review			July 2019

APPENDIX



Fig. 1. Door release button and emergency door release. Please note that the gate must be kept open while using the facility.

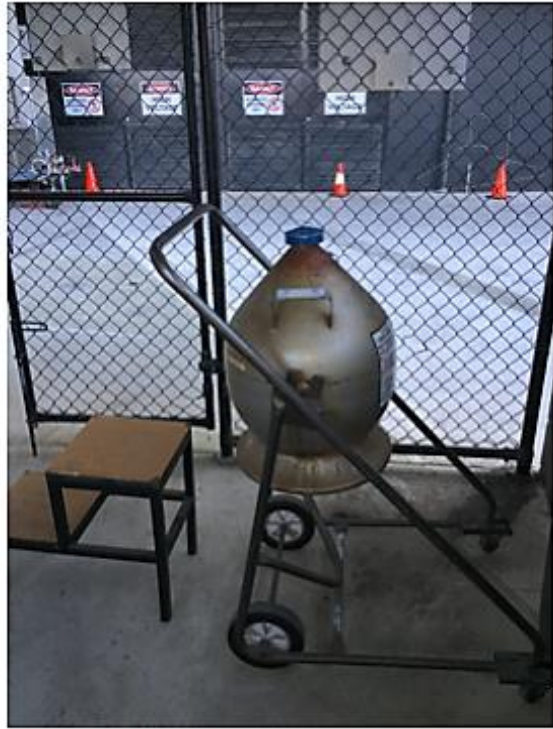


Fig. 2. 30 L mobile dewar and step.



Fig. 3. Gravity fed dewar and spring return handle.



Fig. 4. Closed bleed dewar and fittings.

