

LIQUID NITROGEN SAFETY

Handling Rules

These simple steps **must** be followed when using cryogenic liquids.

Personal Protective Equipment (PPE)

- Wear clean and dry clothing that covers arms and legs.
- The clothing should be loose, so it is easy to remove it when an accident happens.
- **Avoid** wearing open trouser pockets and wrapped sleeves.
- Wear **cryogenic gloves** (provided) *under* the sleeves so no liquid can fall in the gloves.
- Wear **safety glasses** and facial protection (use the **face shield** provided).
- Wear non-slip **closed footwear** and **apron** (provided).

Suffocation danger

- **Make sure** there is enough ventilation, 1 litre liquid becomes 100 litres of gas
- **Avoid** transporting liquid nitrogen in lifts carrying other persons – use the goods lift provided **and the key to ensure it goes directly to required floor.**
- Nitrogen is heavier than air so take care with cellars.
- Carbon dioxide in air is a potential danger. Concentrations from 2.5% cause breathing problems and a concentration of 20% is deadly within some seconds (also when there is still enough oxygen available)

Crispness

- Liquid nitrogen makes stone floors, normal shoe soles and plastic materials crisp and crumble easily, so take care!
- Normal thermos flasks cannot handle low temperatures and the danger of explosion is present.

Clean-up procedures

- ◆ If cryogenic liquids are spilt inside a building make sure there is adequate ventilation.
- ◆ If they are spilt outside, keep up wind of the spill.
- ◆ Evacuate the area until the liquid has evaporated and oxygen levels are at normal atmospheric levels.
- ◆ A **claw** can be used to retrieve samples/tubes. In this case, please contact Merideth Hatton (xn 52536).
- ◆ If there is a large spill, or if a vessel is leaking, contact emergency services (UNSW Emergency, xn 56666) and notify the supplier.

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Safe Work Procedure

A. REFILLING DEWARS IN LABORATORIES

1. Never refill Dewars or transfer Liquid Nitrogen alone!
2. Make sure that there is good ventilation. Open a door if you are in a small room.
NEVER LEAVE A DOOR OPENED IF YOU ARE NOT IN THE ROOM
3. Use Dewars rated for liquid nitrogen
 - a. Never use a Dewar that does not have a pressure relief valve or pressure venting lid/stopper.
 - b. Never use Dewars with makeshift or homemade lids/stoppers.
 - c. Use pressure venting lids/stoppers supplied by the Dewar manufacturer
4. Dewars larger than 20 Litres will be lifted and poured by two people
5. Do not use a Funnel
6. Wear Required Personal Protective Equipment:
 - a. Cryogenic Gloves
 - b. Lab Coat with sleeves pulled over cuffs of Cryogenic Gloves
 - c. Liquid proof Shoe Covers/Spats
 - d. Chemical Splash Goggles or Laboratory Face Shield

B. DISPENSING LIQUID NITROGEN FROM STORAGE TANKS

1. Dispense only into Dewars that are rated for liquid nitrogen. (See A.3 above)
2. Dispense only into Dewars that are:
 - a. Equipped with carrying handles or wheels
 - b. Stable/not in danger of tipping over easily
3. Persons filling Dewar(s) will be in constant attendance during filling
4. Prevent Splashing. Place filling hose at or below the mouth of the receiving Dewar
5. Wear Required Personal Protective Equipment (see A.6 above)

C. TRANSPORTING LIQUID NITROGEN BETWEEN BUILDINGS

1. Use Dewars rated for liquid nitrogen. (See A.3 above)
2. Never Transport Liquid Nitrogen in an Open Container
3. Wear or Carry Required Personal Protective Equipment (see A.6 above)
4. Do not use unstable wheeled carts or Dewars
5. Avoid grates, large cracks in sidewalks/pavement, or other hazards that could cause tipping

D. TRANSPORTING LIQUID NITROGEN WITHIN LABORATORIES AND BETWEEN LABORATORIES IN THE SAME BUILDING

1. Use Dewars rated for liquid nitrogen (see A.3 above).
2. Do not transport Liquid Nitrogen in Open Containers
3. Wear Required Personal Protective Equipment (see A.6 above)
4. If you are carrying a Dewar containing Liquid Nitrogen:
 - a. Make sure Dewar is your ONLY load (no books, coffee, other items)
 - b. Carry transport Dewar as far away from your face and body as possible
 - c. Watch for other people who may run into or bump you

