



Biosafety Office

Cryovial Storage & Liquid Nitrogen

Cryovials are commonly used in laboratories for the storage of biological materials in liquid nitrogen. When vials are stored within the liquid-phase of the tank, liquid nitrogen can seep into the vials. Upon removal from low temperature storage, liquid nitrogen that may have seeped into the vial can suddenly expand (up to 700 times) and result in vial explosion causing not only physical injury but also exposure to the hazard from the vial contents.

Cryovial Storage & Thawing

- Whenever possible, cryovials should be stored in the vapor phase above the liquid nitrogen (rather than being immersed in the liquid) to avoid liquid nitrogen seeping into the vials. Most manufacturers of cryovials do not recommend liquid-phase storage. Another option is to slowly move vials from the liquid to the vapor phase over the course of 24 to 48 hours prior to removal.
- When liquid-phase storage is required or necessary, specialized cryoflex tubing (available from various scientific vendors) or other safety enclosures that can be heat sealed to prevent the entry of liquid nitrogen into cryovials should be used.
- Do not overfill cryovials beyond the designated fill line to prevent the risk of cracking and possible release of contents and/or seeping of liquid nitrogen into the vial.
- Cryovials should be made of certified polypropylene for use in liquid nitrogen. Explosions are much less likely if vials have internal threads and male caps.
- Avoid overtightening caps prior to storage to prevent damage of the rubber o-ring seal in the neck of the vial since it increases the risk of liquid nitrogen entering the vial leading to explosion. Similarly, caps should not be too loose since liquid nitrogen might seep through the vial.
- Wear cryogenic gloves, long-sleeved lab coat, impact resistant full-face shield that also covers the neck, and closed-toe shoes.

