

## Safe Science = Good Science

June 29, 2022



Cryogenic gloves protect the wearer from ultra-cold temperatures down to  $-196^{\circ}\text{C}$  ( $-320^{\circ}\text{F}$ ). While the gloves are waterproof to provide protection from spills and splashes, they are NOT rated for immersion into liquid nitrogen or other cryogenic liquids. They are used to protect you from frostbite and the extreme cold. Use tongs to retrieve items that have been accidentally submerged in the liquid.

### Fun Fact!

A favorite summer treat known as Dippin' Dots is made using liquid nitrogen. The company is also based out of Paducah, KY.



For questions or concerns please call DEHS at 852-6670 or email [dehsubm@louisville.edu](mailto:dehsubm@louisville.edu)

# Liquid Nitrogen Safety

Liquid nitrogen is the liquefied form of the element nitrogen that is produced commercially by the fractional distillation of liquid air. At normal pressure, liquid nitrogen boils at 77 K ( $-195.8^{\circ}\text{C}$  or  $-320.4^{\circ}\text{F}$ ). Nitrogen is non-toxic, odorless, and colorless. It is inert and is not flammable. Nitrogen gas is slightly lighter than air when it reaches room temperature. It is slightly soluble in water.

### PPE Requirements:

- Safety Goggles or Full-face shield
- Lab Coat
- Cryogenic Gloves



### When working with liquid nitrogen, taking safety precautions is paramount:

- Liquid nitrogen is cold enough to cause severe frostbite on contact with living tissue. You must wear proper safety gear when handling liquid nitrogen to prevent contact or inhalation of the extremely cold vapor.
- Because it boils so rapidly, the phase transition from liquid to gas can generate a lot of pressure very quickly. Do not enclose liquid nitrogen in a sealed container, as this may result in it bursting or an explosion.
- Adding large quantities of nitrogen to the air reduces the relative amount of oxygen, which may result in an asphyxiation risk. Cold nitrogen gas is heavier than air, so the risk is greatest near the ground. Use liquid nitrogen in a well-ventilated area.
- Liquid nitrogen containers may accumulate oxygen that is condensed from the air. As nitrogen evaporates, there is a risk of violent oxidation of organic matter.

### Dewar Storage

This type of container is a non-pressurized container. The unit of measure for the capacity of a Dewar is typically a liter. Five-to-200-liter Dewar's are available. Product may be removed from small Dewar's by pouring, while larger sizes will require a transfer tube. **Any pressurized vessel is not a Dewar.**

