

## LIQUID NITROGEN ICE CREAM SAFETY

**WARNING: EHS does NOT endorse this non-traditional use of liquid nitrogen. Cryogens are capable of causing severe injury and even death. Extreme care must be taken by properly trained users.**

Making ice cream with liquid nitrogen has grown to be extremely popular. While this is a fun social activity and an entertaining demonstration of scientific principles, there are several things to keep in mind when working with liquid nitrogen:

- Liquid nitrogen is **EXTREMELY COLD**. While it might look like boiling water, the temperature actually ranges from -346° F to -320.44 ° F. That's over 300° F **BELOW** zero.
  - Skin and eyes can be frozen very quickly. Care must be taken to avoid direct contact with the liquid. Proper personal protective equipment must be worn. These include safety goggles, non-absorbable cryoprotectant gloves, a lab coat, long pants without cuffs and closed-toe shoes. Keep skin covered. The idea is to protect the body from direct contact and also from any splashing that might occur while making the ice cream. Remember that the vapors are also extremely cold and may cause skin and eye damage.
  - Use proper containers when making your ice cream. Cold temperatures can crack and shatter glass, ceramic and plastic. Use wooden spoons, metal bowls and wear gloves.
  - Do not consume liquid nitrogen. Even a small amount of liquid, when consumed, will expand significantly inside the body to potentially dangerous levels. All excess liquid in a batch of ice cream must be allowed to evaporate, "boil" off. If it's too hard to stir, it's too cold to serve.
- Liquid nitrogen is an **ASPHYXIAN**. At room temperature, one liter of liquid expands to 24.6 cubic feet of gas.
  - Do not use liquid nitrogen in an enclosed space. Nitrogen gas will displace the oxygen and may lead to oxygen deprivation/asphyxia if used in an inappropriately ventilated area. Always work in a well-ventilated area.
  - Do not transport liquid nitrogen in a vehicle, on a Yale shuttle, etc.
- Only use approved liquid nitrogen dewars. These containers are designed to hold liquid nitrogen. Using enclosed containers not designed for liquid nitrogen can lead to **OVER-PRESSURIZATION** and **RUPTURE**.
  - Dewars must be washed by filling to capacity with a solution of mild detergent (Dawn) and water. All soap residue must then be thoroughly rinsed out and the dewar must be dried out completely before use.
- Food safety is important.
  - Preparers and servers should wash their hands frequently.
  - Keep your ingredients refrigerated until use. Eliminate unnecessary risks by refraining from using nut/egg ingredients.
  - Make sure you use clean utensils/bowls.
- Do not obtain liquid nitrogen from a laboratory.
- Order food grade liquid nitrogen through SciQuest. The Airgas part number for this item is NI FG230LT22.
- Contact EHS at 203-785-3550 with concerns.