General Precautions for All Use of LN2 (Liquid Nitrogen)

* The Extremely low temperature of the liquid can cause severe frostbite or eye damage upon contact. Items in contact with liquid nitrogen become extremely cold. Touching these items can result in torn flesh. Substances become brittle upon contact with liquid nitrogen and may shatter when cold, such items are common glass and large solid plastics, which can send material flying, possibly causing an injury.
* On vaporization LN2 expands by a factor of 700; one liter of liquid nitrogen becomes 24.6 cubic feet of nitrogen gas. This can cause an explosion of a sealed container. The release of nitrogen can also displace oxygen in a room and cause asphyxiation. Nitrogen does not have good warning properties. You may feel light headed or simply pass out without any warning.
* Because the boiling point of oxygen is above nitrogen, oxygen can condense from the air into the liquid nitrogen. If dewars and insulated flasks containing liquid nitrogen are left uncovered for extended periods of time, liquid oxygen can build up to levels which may cause violent reactions with organic materials (i.e. severe clothing fire could result).

Personal Protective Equipment (PPE) Required When Handling Liquid Nitrogen

1. Safety Goggles (unvented)-required at all times
2. Face Shield-required when pouring or filling
3. Insulated Gloves- gloves should be loose fitting enough so they can be quickly removed if liquid should pour in them. You can also purchase elastic cuff insulated gloves- gloves are required
4. A lab coat with long sleeves is required to minimize skin contact. Also, pants should be worn on the outside of shoes or boots to prevent shoes from filling in the event of spillage.
5. When handling large quantities of LN2, an apron should be used as well.

Rules and Precautions for Handling Liquid Nitrogen

1. You should be trained before using liquid nitrogen both in protocol and safety procedures.
2. Always use Personal Protective equipment when handling liquid nitrogen.
3. Use liquid nitrogen only in well ventilated spaces. Never dispose of liquid nitrogen by pouring on the floor or on pavement. It could displace enough oxygen to cause suffocation. Remember that nitrogen is colorless and odorless- the cloud that forms when you pour liquid nitrogen is condensed water vapor from the air, not nitrogen gas.
4. Do not allow any liquid nitrogen to touch any part of your body or become trapped in clothing near the skin.
5. Do not touch any item that has been immersed in liquid nitrogen until it has warmed to room temperature.
6. Do not store liquid nitrogen in any container with a tight fitting lid. A tightly sealed container will build up pressure as the liquid boils and will explode. Use fittings that have been designed specifically for use with cryogenic liquids as non-specialized equipment may crack or fail. Do not transport liquid nitrogen in wide mouth glass dears or dewars not protected with safety tape.
7. Never dip a hollow tube into liquid nitrogen; it may spurt liquid nitrogen.
8. Never ride in an elevator with liquid nitrogen. When using passenger elevators, use an elevator key to prevent the door from being opened by unauthorized people. If a key or dumb waiter is not available, then station a person at each floor so that no one enters.
9. It is advisable to use a buddy system when transferring liquid nitrogen from a loading dock or primary dispensary area without a second person available. Failure of a container or a large spill could result in asphyxiation at a time when you are unlikely to be found or to get immediate assistance.
10. Always fill warm dewars slowly to reduce temperature shock effects and to minimize splashing.
11. Always make sure that containers of liquid nitrogen are suitably vented and unlikely to block due to ice formation.
12. Do not fill cylinders and dewars to more than 80 % capacity, since expansion of gases during warming may cause excessive pressure build up.