



Attn: Lab Users
Liquid Nitrogen and other Cryogenic Gas
Transport in Elevators

Safety Bulletin

There have been recent concerns regarding safe transport of Liquid Nitrogen (LN₂) in elevators on campus. A serious risk of LN₂ is the rapid displacement of oxygen caused by the evaporation of spilled liquid into gaseous form. Laboratories that use LN₂ typically have adequate air volume and mechanical ventilation to exhaust or dilute spilled LN₂. However, elevators are typically not mechanically ventilated and therefore have limited to no dilution air in the event of an LN₂ spill. The expansion ratio of LN₂ from liquid to gas at 70° F is approximately 1 to 700. Based on the properties of LN₂, a relatively small spill in an elevator could reduce oxygen levels from normal atmospheric concentration of 21% to 19.5%, the minimum safe level as defined by the American Conference of Governmental Industrial Hygienist (ACGIH) and the Occupational Safety and Health Administration (OSHA.)

Based on the consequences of a spill in an enclosed space, CU EH&S recommends avoiding transport of LN₂ (or other cryogenic gasses) in elevators. However, if transport of LN₂ in an elevator is unavoidable, the maximum cylinder size when passengers are present should be 1 liter. If containers of liquid nitrogen or other cryogenic gasses greater than 1 liter must be transported in an elevator, the elevator must travel between floors unoccupied. Cylinders should be loaded on the elevator, posted with a sign to warn others not to ride with the cylinder and sent directly to the delivery floor. The person transporting should walk up to the delivery floor and remove the cylinder. A second person could be available on the receiving floor to take the cylinder off the elevator at its destination.

If you have questions or concerns regarding this matter please contact your department's safety coordinator, Building Proctor or EH&S at 303-492-6025.