Liquid Nitrogen – Safe Handling Stats and Facts

FACTS

1. **Cryogenic Burns:** Direct skin contact with liquid nitrogen during lab, industrial, or food service tasks can cause severe frostbite or tissue damage.
2. **Eye Injuries:** Splash incidents when pouring or transferring liquid nitrogen can lead to permanent eye damage if face shields are not used.
3. **Asphyxiation Risk:** In poorly ventilated areas, nitrogen gas displaces oxygen, creating a serious suffocation hazard for workers.
4. **Explosion Hazards:** Sealed or improperly vented containers can rupture violently as liquid nitrogen rapidly expands into gas.
5. **Material Embrittlement:** Contact with structural components or tools can cause metals and plastics to become brittle and shatter unexpectedly.
6. **Improper PPE Use:** Lack of insulated gloves, aprons, or eye protection during transfer increases risk of direct contact or splash injury.
7. **Transportation Spills:** Handling or moving dewars on uneven terrain or with improper restraints can result in spills or container damage, exposing workers to immediate hazards.

STATS

- In 2024, OSHA recorded 5,190 workplace fatalities, with rare LN2-related fatalities (<0.5%) typically tied to asphyxiation in confined spaces. Proper ventilation and PPE could prevent most incidents, per NIOSH.
- In 2024, PPE violations (29 CFR 1910.132) ranked 6th across industries (1,876 citations), including inadequate cryogenic gloves or face shields during LN2 handling. Hazard

Communication violations (29 CFR 1910.1200) ranked 2nd (3,200 citations), often due to missing SDS or training.

- A 2022 NIOSH study found that 15% of workers handling cryogenic materials faced oxygen depletion risks due to poor ventilation, with 8% reporting symptoms like dizziness or confusion.
- WorkSafeBC reported 25–30 annual fatalities in outdoor and industrial occupations in British Columbia (2020–2023), with LN2-related incidents rare (<1%) but tied to asphyxiation in confined spaces. Ventilation and PPE are critical.
- CCOHS 2023 data showed that workplaces enforcing cryogenic gloves, face shields, and ventilation reduced LN2-related injuries by 20%, particularly in food service and construction.
- In 2024, Ontario introduced fines up to $500,000 for repeat OHS violations, including PPE non-compliance, impacting firms failing to provide proper safety gear for LN2 handling.