

Risks of Inerting Gases

10/01/05

Argon, carbon dioxide, helium, krypton, neon, nitrogen and xenon are all inert gases that can displace oxygen in air and cause significant health effects up to and including rapid suffocation. Typically we relate these inert gases and their asphyxiant hazards with confined spaces.

However, serious accidents can occur in the open or in partly enclosed areas or in areas with minimal air movement. Inerts can also collect in pits and other low-lying areas where ventilation is poor. If the oxygen content is reduced by only a few percent from the normal oxygen content in air (approximately 21 percent) there can be a substantial risk to life. OSHA defines an oxygen-deficient atmosphere as an atmosphere with less than 19.5 percent by volume.

The potential asphyxiant hazards can increase rapidly when an inert gas is handled as a cryogenic liquid. If released, these cryogenic liquids generate extremely large volumes of inert gas, which can rapidly displace the oxygen in the air. Any time there is a leak or spill of an inert gas cryogen, there is a serious hazard of oxygen deficiency in the atmosphere.

You should make inert gases an important part of your Hazard Communication Program. Make sure your employees understand the hazards associated with inert gases and how they should respond in case of an inert gas release.

Effect Thresholds for Exposure to Reduced Oxygen*

(Healthy Individuals at Sea Level)

Volume % Oxygen	Effect
17	Night vision reduced
	Increased breathing volume
	Accelerated heartbeat
16	Dizziness
	Reaction time for novel tasks doubled
15	Impaired attention
	Impaired judgment
	Impaired coordination
	Intermittent breathing
	Rapid fatigue
	Loss of muscle control
12	Very faulty judgment
	Very poor muscular coordination
	Loss of consciousness
	Permanent brain damage
10	Inability to move
	Nausea
	Vomiting
6	Spasmodic breathing
	Convulsive movements
	Death in 5-8 minutes