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SAFE USE OF ARGON

All PFI Standards and Best Practices are advisory only. There is no agreement to adhere to any PFI Standard or Best Practice and their use by anyone is entirely voluntary.

PFI Safe Use of Argon Best Practice

Introduction

Argon is known as one of the “Noble” gases since it does not react with other materials. It is nonflammable, will not support combustion, displaces oxygen, and is not life-supporting. The gas is heavier than air and is only slightly soluble in water. When liquid argon is vaporized and then heated it consumes a large amount of heat, making it an ideal coolant.

Argon is a gas that is used in many welding processes. The inerting properties are used as shielding/blanket gas for many welding applications. The area of the weld is protected from airborne contaminants by the shielding gas argon. The argon gas helps keep the weld free of fusion defects, porosity, weak welds, oxidation and other defects due to varying arc length.

Health Affects

Argon is a simple asphyxiant. Effects of oxygen deficiency resulting from simple asphyxiates may include rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgment, depression of all sensations, emotional instability, and fatigue. As asphyxiation progresses, nausea, vomiting, prostration, and loss of consciousness may result, eventually leading to convulsions, coma, and death. At low oxygen concentrations, unconsciousness and death may occur in seconds and without warning. Argon is odorless, colorless, tasteless, and nonirritating, which means it has no warning properties. Humans possess no senses that can detect the presence of Argon.

Contact with rapidly expanding argon near the point of release may cause frostbite, with redness, skin color change to gray or white, and blistering. First aid measures are not required for gas. If frostbite is suspected, flush eyes with cool water for 15 minutes and obtain immediate medical attention. For frostbite, immerse skin in lukewarm water. DO NOT USE HOT WATER. Obtain medical attention.

Ingestion is unlikely since argon is a gas at room temperature. In cases of inhalation and overexposure, prompt medical attention is required. Rescue personnel should be equipped with self-contained breathing apparatus. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, and if breathing has stopped, administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

Handling and Storage

Argon is noncorrosive and may be used with all common structural materials. Use only in well-ventilated areas. Use local exhaust in combination with general ventilation as necessary to prevent accumulation of high concentrations and maintain air oxygen level at or above 19.5%.

Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time.

Some additional guidelines include:

- Valve protection caps must remain in place unless container is secured with valve protection outlet piped to use point.
- Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement.
- Use a pressure reducing regulator when connecting cylinder to lower pressure piping or systems.
- Do not heat cylinder by any means to increase the discharge rate of product from the cylinder.
- Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.
- Protect cylinders from physical damage.
- Do not insert any object (i.e.: screwdriver) into valve cap openings as this can damage the valve causing leakage.
- Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, or van.
- A leak can result in asphyxiation or a toxic exposure.

For additional recommendations, consult Compressed Gas Association Pamphlets P-1, G-10.1, P-8.1, P-8.2, P-9, P-16, P-18, and Safety Bulletin SB-2.

Argon Gas Dangers in Confined Space

Argon use of any kind (welding, purging, inerting, etc...) in a confined space is extremely dangerous because it displaces oxygen. Argon gas can collect over time causing adverse short and long term health effects up to and including death. Confined space evaluation should be completed prior to performing welding with the use of argon in a confined space per an employer's policies and procedures. This requires the company to make sure all sections of the general industry confined space standard (29 CFR 1910.146) are being followed.