

SAFETY ALERT

HAZARDS OF LIQUID NITROGEN IN NEAR-CONSUMER APPLICATIONS

In the past few years, the use of liquid nitrogen (LIN) has grown in popularity in near-consumer applications for use in food and beverage preparation and consumption and to entertain the patrons with vapor clouds and “smoke” effects at the front end of food and beverage establishments. The use of LIN has also been highlighted on many television cooking shows and at trade shows and entertainment venues in various food related demonstrations. LIN also is used to take advantage of its extremely cold properties in some personal cryotherapy applications. The variety of uses for LIN include freezing foods, preparing cold drinks, and creating clouds or other special effects with the vapor cloud LIN produces.

These kinds of near-consumer applications pose significant risks that LIN will be handled by inexperienced workers with inadequate training or safety precautions. The Compressed Gas Association (CGA) is aware of several incidents that have resulted in serious injuries to: customers who have consumed or come into contact with LIN; workers who used it for food or beverage preparation; or individuals who have used it for personal cryotherapy treatments.

- LIN is a cryogenic fluid and simple asphyxiant, which quickly turns to a gas and expands rapidly at room temperature [1]. One cubic foot of liquid can expand into 700 cubic feet of gas.
 - Never use LIN in an enclosed or inadequately ventilated area or room. As the LIN rapidly turns into a gas it can quickly displace oxygen in the air and create a risk of oxygen deficiency and asphyxiation [1]. Breathing in an oxygen-deficient atmosphere can lead to lightheadedness, unconsciousness, or even death in only a few breaths. Because nitrogen gas and LIN are odorless, air monitoring is recommended to detect oxygen-deficient atmospheres.
 - Never trap LIN in an enclosed container not designed for this purpose. As the liquid warms, the pressure rises, and containers that are not equipped with an adequate means of venting can rupture catastrophically.
 - Never consume LIN directly. Even a small amount of LIN, when ingested, will expand significantly inside the body to potentially dangerous levels and cause cryogenic burns and other serious injury.
- LIN is an extremely cold liquid (–320 °F [–196 °C]) and can burn or freeze body tissue quickly.
 - The LIN and its associated cold vapors can quickly burn skin, eyes, and tissue if direct contact is made. Care should be taken to prevent direct contact with the skin and to protect the body from splashing or spraying of liquid or cold vapors by use of appropriate personal protective equipment (PPE).
 - LIN must never be ingested directly or be allowed to come in contact with flesh, unless administered by a physician. LIN and its very cold vapors can freeze tissue, especially delicate tissue such as the mouth, esophagus, and stomach, causing permanent damage.

For more detailed information on the properties, safe handling, and use of liquid nitrogen and other cryogenic liquids, refer to the supplier’s safety data sheet on LIN and CGA P-12, *Safe Handling of Cryogenic Liquids* [2].

References

Unless otherwise specified, the latest edition shall apply.

[1] CGA SB-2, *Oxygen-Deficient Atmospheres*, Compressed Gas Association, Inc. www.cganet.com

[2] CGA P-12, *Safe Handling of Cryogenic Liquids*, Compressed Gas Association, Inc. www.cganet.com

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Safety and Health Committee

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