

Nitrogen

Product Stewardship Summary

Chemical Information

Nitrogen was discovered in 1772 by Daniel Rutherford who called it “noxious air” or “fixed air.” Antoine Laurent de Lavoisier isolated it in 1786. The name nitrogen come from Latin “nitrogenium,” where “nitrum” (from Green nitron) means “saltpetre” and “genes” means forming.

Nitrogen is an inert gas with many industrial applications. It is liquefied by cooling at -320.8°F (-196°C / 77.15 K). It is mainly found in the atmosphere, where it accounts for 78% by volume of the air we breathe. But nitrogen is also found in the Earth’s crust in the form of nitrates, in organic form within living and dead organisms, in mineral form as ammonia, thus contributing to soil fertility.

In gaseous form, nitrogen is a neutral and colorless gas.

Chemical Formula: N₂

Other Names: LIN, GAN

Applications, Benefits, & Use

Chemicals: Nitrogen is used as a carrier gas, temperature control and/or catalyst preparation in chemical processes.

Oil & Gas: Nitrogen protects (blanketing and inerting) products, facilities, storage tanks and pipelines. It is also used in pipeline purging, cleanouts and leak testing. Nitrogen is used for fracking operations.

Electronics: Nitrogen is used as a carrier gas for the protection of impurities and oxidation during the production of semiconductors and welding. Nitrogen is used to chill wafers without contamination after a treatment.

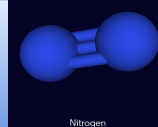
Metal Fab & Automotive: Nitrogen is used for heat treatment and laser cutting. Nitrogen-filled tires have an increased lifetime.

Food: Liquid nitrogen is used to chill, freeze or control temperature of food products. Nitrogen preserves and protects foods with Modified Atmosphere Packaging (MAP) to minimize oxidation, microorganism growth or package collapse.

Hospital Care: Nitrogen is used for cryo-dermatology and cryo-preservation. It is also a component of inhaled gaseous mixtures for pulmonary function tests.

Regulatory Information

There are regulations that govern the manufacture, sales, transportation, use and/or disposal of materials. These regulations vary by city, state, country or geographic region. Additional regulatory information may be found on the Safety Data Sheet as well as local and federal agency websites.



Human Health and Environmental Effects

Human Health:

- Air is composed of 78% nitrogen.
- High nitrogen levels in air that displaces the oxygen can lead to dizziness, nausea, vomiting, loss of consciousness and death.
- People should not enter an area with less than 19.5% oxygen without special breathing equipment to prevent suffocation.
- Liquid nitrogen can result in severe frostbite, skin burns, and other tissue damage when in contact with skin or other tissues.

Environment:

- Manufactured nitrogen is not a toxic substance and is a naturally occurring chemical in the environment
- Plants and animals use nitrogen from the environment and then they return it to the atmosphere.

Exposure Potential and Risk Mitigation Measures

Industrial Use:

- Nitrogen is shipped as a high pressure gas or supercooled liquid. Precautions should be taken based on shipment type. (pipeline, bulk transport trucks, gas and liquid cylinders, etc.).
- It is important to have good ventilation when working with nitrogen. Use atmospheric monitors to ensure oxygen levels do not decrease below 19.5% that create an oxygen deficient atmosphere.
- Personnel should be trained on the hazards and risks of nitrogen.

Consumer Use:

- Nitrogen is transported by pipeline, exposure to direct consumers is not anticipated.

Additional Sources of Information

- Air Liquide Gas Encyclopedia
- Air Liquide Safety Data Sheets
- American Chemistry Council
- Compressed Gas Association

Contact Information

For matters related to health, safety, security, environment or Responsible Care® commitments, contact us by phone at 713-438-6721 or by [email](#).