

Voltaix, Inc.

Material Safety Data Sheet for Nitrogen (N₂)

Reference: Voltaix, Inc. MSDS Document Number-N000 (revision dated 03 Sept 96)

IN AN EMERGENCY, CALL CHEMTREC at 800-424-9300 (US toll free) or 703-527-3887

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Section 1: *Chemical Product and Company Identification*

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Material Name: Nitrogen**Chemical Formula:** N₂**Synonyms:** None

Note: This Material Safety Data Sheet addresses the compressed, gaseous form of this substance, not the refrigerated liquid.

Manufacturer: Voltaix, Inc.:

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Section 2: *Composition/Information on Ingredients*

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Component	CAS Registry Number	Molar (volume) concentration	Exposure Guidelines
Nitrogen	7727-37-9	balance	Simple asphyxiant

Section 3: *Hazards Identification*

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Emergency Overview

Nitrogen is a colorless gas with no odor or taste. It is not toxic; the only health hazard is that it is an asphyxiant and may displace oxygen in a workplace atmosphere.

NFPA 704 Rating (determined by Voltaix, Inc.):

Health	0
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Flammability	0
Reactivity	0
Special	None

Potential Health Effects

Routes of Exposure: Nitrogen is not toxic by any route. Asphyxia may result if the oxygen concentration is reduced to below 18% by displacement.

Lengths of Exposure: None of the available data indicate toxicity for exposures of any duration.

Severity of Effect: No effect identified.

Target Organs: None identified.

Type of Effect: No effect identified.

Signs and Symptoms of Exposure: None identified.

Medical Conditions that may be Aggravated by Exposure: None identified.

Reported Carcinogenic and Reproductive Effects: None known to Voltaix, Inc.

Section 4: *First Aid Measures*

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Asphyxiation

This is the primary health risk.

1. Remove the affected person from the gas source or contaminated area. Note: Personal Protective Equipment (PPE), including positive pressure, self contained breathing apparatus, may be required to assure the safety of the rescuer.
2. If the affected person is not breathing spontaneously, administer rescue breathing.

3. If the affected person does not have a pulse, administer CPR.
4. If medical oxygen and appropriately trained personnel are available, administer 100% oxygen to the affected person.
5. Summon an emergency ambulance. If an ambulance is not available, contact a physician, hospital, or poison control center for instruction.
6. Keep the affected person warm, comfortable, and at rest while awaiting professional medical care. *Monitor the breathing and pulse continuously.* Administer rescue breathing or CPR if necessary.

Skin Contact

No detrimental effect of skin contact has been reported.

Eye Contact

No detrimental effect of eye contact has been reported.

Ingestion

Ingestion is not an observed route of exposure to gaseous hazardous materials.

Chronic Effects

None is known to Voltaix, Inc.

Note to Physicians:

None.

Section 5: Fire Fighting Measures

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Flammability and Explosivity

Flash Point: Not applicable, this material is a nonflammable gas.

Flammability Limits in Air: Not applicable, this material is a nonflammable gas.

Autoignition Temperature: Not applicable, this material is a nonflammable gas.

Flammability Classification (per 29 CFR 1910.1200): Nonflammable gas.

Known or Anticipated Hazardous Products of Combustion: Not applicable, this material is a nonflammable gas.

Properties that may Initiate or Intensify Fire: None.

Reactions that Release Flammable Gases: None known to Voltaix, Inc.

Extinguishing Media

Not applicable, this material is a nonflammable gas.

Fire Fighting Instructions

Cool the cylinder and surroundings with water from a suitable distance. Excessive pressure may develop in gas cylinders exposed to fire, which may result in explosion, regardless of the cylinder's content. Cylinders with pressure relief devices (PRD's) may release their contents through such devices if the cylinder is exposed to fire. Cylinders without PRD's have no provision for controlled release and are therefore more likely to explode if exposed to fire.

Positive pressure, self contained breathing apparatus is required for all fire fighting involving hazardous materials. Full structural fire fighting (bunker) gear is the *minimum* acceptable attire. The need for proximity, entry, and flashover protection and special protective clothing should be determined for each incident by a competent fire fighting safety professional.

Section 6: Accidental Release Measures

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Containment

As nitrogen is a gas at atmospheric conditions, the only means of containment is the enclosure of the space into which it is released. Containment is described in [Section 7](#).

Clean Up

Clean up consists exhausting the enclosure to the atmosphere. As the only hazard is asphyxiation, dilution with room air until an adequate oxygen concentration (18%) is reached is all that is required.

Evacuation

If the release is not contained in an appropriate device or system, all personnel not appropriately

protected (see [Section 8](#)) must evacuate the contaminated spaces. If the contents of more than one cylinder is released, consider evacuation of additional areas as a precaution against spread.

Special Instructions

None.

Section 7: Handling and Storage

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Handling

Handle this material only in sealed, purged systems. The design of handling systems for hazardous materials is beyond the scope of this MSDS, and should be performed by a competent, experienced professional. Consider the use of diaphragm or bellows sealed, soft seat valves; backflow prevention devices; and flow monitoring or limiting devices. Gas cabinets, with appropriate exhaust treatment, are recommended, as is automatic monitoring of the secondary enclosures and work areas for release.

Handle sealed gas cylinders in accordance with CGA P-1, *Safe Handling of Compressed Gases in Containers*.

Some material may have accumulated behind the outlet plug. Face the outlet away from you and wear appropriate protective equipment when removing the plug to connect the cylinder to your system.

Never introduce any substance into a gas cylinder. If you believe your cylinder may have been contaminated, notify Voltaix, Inc. immediately. Provide as much information as possible on the nature and quantity of contamination.

Storage

Store cylinders in accordance with CGA P-1, *Safe Handling of Compressed Gases in Containers*, local building and fire codes and other relevant regulations. Materials should be segregated by the hazards they comprise for storage.

Protect the cylinders from direct sunlight, precipitation, mechanical damage, and temperatures above 55°C (130°F).

Ship and store cylinders with the outlet plug and valve protective cap in place.

Section 8: Exposure Control/Personal Protection

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Engineering Controls

Local exhaust is required.

Consider monitoring the work area continuously for oxygen concentration. Automatic alerting of personnel and automatic shutdown of flow are appropriate in some applications and are required in some jurisdictions.

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Personal Protective Equipment (PPE)

Respiratory Protection: Positive pressure, full face, air supplied breathing apparatus should be used for work within a confined space.

Eye/Face Protection: When using respiratory protection as described above, use a face mask that provides splash and impact protection for the face and eyes. Otherwise, wear safety glasses.

Skin Protection: Wear appropriate gloves when handling cylinders.

Other Protection: Wear appropriate protective footwear when moving cylinders.

Exposure Guidelines

As nitrogen is a simple asphyxiant, no TLV (ACGIH), PEL (OSHA), or REL (NIOSH) has been established. Workplace concentrations should be controlled to assure adequate oxygen concentration (18%).

Section 9: Physical and Chemical Properties

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Notes: 1) "N/A" means not applicable.

2) Unless otherwise specified, properties are reported at 0°C (32°F) and 1 atmosphere (1.0 bar, 14.7 psia).

Property	Nitrogen
Appearance	colorless
Odor	none
Physical state	gas
pH	N/A
Vapor Pressure	N/A
Vapor Density	1.146 g/L
Boiling point	-195.8 deg. C (-320 deg. F)
Melting point	N/A
Solubility in water (v/v, at 20° C)	0.0149
Specific gravity (liquid)	N/A
Molecular weight	28.01

Section 10: *Stability and Reactivity*

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Chemical Stability: Nitrogen is stable.

Conditions to Avoid: None.

Incompatibility with Other Materials: None.

Hazardous Decomposition, Reaction and Oxidation (other than burning) Products: None.

Hazardous Polymerization: Has not been observed.

Section 11: *Toxicological Information*

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Acute Data (by route): None, nitrogen is a simple asphyxiant.

Chronic and Subchronic Data: Nitrogen is listed in RTECS, but no information on its carcinogenicity or other effects is included.

Special Studies: None known.

Section 12: *Ecological Information*

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Ecotoxicity: None known to Voltaix, Inc.

Environmental Fate: None known to Voltaix, Inc.

Section 13: *Disposal Considerations*

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Classification under RCRA, 40 CFR 261: This material is not listed.

US EPA waste number and descriptions: None.

Special Instructions and Limitations: Treat process and other exhaust streams appropriately before release to the atmosphere.

Notice: The information above is derived from Voltaix, Inc.'s interpretation of the US federal laws, regulations and policies concerning the material, as shipped by Voltaix, Inc., at the time this MSDS was prepared. Federal controls are subject to change and state and local controls may also apply. Proper waste disposal is the responsibility of the owner of the waste. The user is encouraged to consult with appropriate experts in developing a disposal plan.

Section 14: *Transport Information*

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Basic Description: Nitrogen, Compressed, Division 2.2 (Nonflammable Gas), UN 1066.

Additional Information for shipment by water: IMDG Page Number 2163.

Additional Information for shipment by air: Transportation by air is permitted in cargo and passenger aircraft.

Section 15: *Regulatory Information*

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TSCA Status: This material is listed on the Inventory of Chemical Substances. **CERCLA**

Reportable Quantity (40CFR302.40): This material is not listed.

SARA Title III Status (Section 302 (40CFR355), Section 311/312, Section 313 (40CFR372)): No Threshold Planning Quantities (TPQ's) or Reportable Quantities (RQ's) are listed for these substances. The default federal MSDS submission and inventory requirement filing threshold of 4,540 kg (10,000 lbs.) therefore applies.

Note: State and local requirements may be more stringent.

Section 16: *Other Information*

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References

Book of SEMI Standards, Facilities Standards and Safety Guidelines. Mountain View, CA: Semiconduct or Equipment and Materials International, 1993.

Borak, Jonathan, M.D., Michael Callan and William Abbott, *Hazardous Materials Exposure: Emergency Response and Patient Care.* Englewood Cliffs, NJ: Prentice-Hall, Inc., 1991.

Braker, William and Allen L. Mossman, *Matheson Gas Data Book(Sixth Edition)*. Lyndhurst, NJ: Matheson, 1980.

Documentation of TLV's and BEI's. Cincinnati, Ohio: American Conference of Government Industrial Hygienists, 1992.

Fire Protection Guide on Hazardous Materials. Quincy, MA: National Fire Protection Association, 1993.

Material Safety Data Sheet: Nitrogen. Irvington, NJ: Spectra Gases, Inc., 1992.

Safe Handling of Compressed Gases in Containers (Pamphlet P-1). Arlington, VA: Compressed Gas Association, Inc., 1991.

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Revision Indication

International telephone number for Chemtrec revised.

Disclaimer

Voltaix, Inc. cannot guarantee that these are the only hazards that exist. Users are solely responsible for the safe storage, handling, use and disposal of this material, and for compliance with the applicable laws, regulations and accepted practices.

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