

STOODY INDUSTRIAL AND WELDING SUPPLY, INC.**MATERIAL SAFETY DATA SHEET (MSDS)****1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION****PRODUCT NAME:** Nitrogen, refrigerated liquid**CHEMICAL NAME:** Nitrogen**CHEMICAL FAMILY:** Inert gas**FORMULA:** N₂**SYNONYMS:** Nitrogen NF, LIN, Cryogenic Liquid Nitrogen, Liquid Nitrogen**NAME AND ADDRESS:**

STOODY INDUSTRIAL AND WELDING SUPPLY, INC.

3316 National Avenue

San Diego, CA 92113

TELEPHONE:**Emergency Phone: (800) 633-8253 (24 hr.)****Routine information call: (619) 234-6750**

Weekdays 7:30 AM – 5:00 PM

[USE]: Various, inerting, medical, food freezing:**2. COMPOSITION/INFORMATION ON INGREDIENTS**

INGREDIENT NAME /CAS NUMBER	PERCENTAGE	OSHA PEL	ACGIH TLV
NITROGEN/7727-37-9	>99%	None	Simple Asphyxiant

[LD₅₀]: None. **[LC₅₀]:** None.**3. HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW:**

WARNING! Extremely cold liquid and gas under pressure.
Can cause rapid suffocation.
Can cause severe frostbite.

POTENTIAL HEALTH EFFECTS INFORMATION:**ROUTES OF EXPOSURE:**

INHALATION: Simple asphyxiant. Nitrogen is nontoxic, but may cause suffocation by displacing the oxygen in air. Exposure to oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

EYE CONTACT: Tissue freezing and severe cryogenic burns of eyes.

SKIN CONTACT: Tissue freezing and severe cryogenic burns of skin.

[SKIN ABSORPTION]: Not applicable.

[INGESTION]: Not applicable.

CHRONIC EFFECTS: None established.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None

OTHER EFFECTS OF OVEREXPOSURE: None.

CARCINOGENICITY: Nitrogen is not listed by NTP, OSHA or IARC.

4. FIRST AID MEASURES

INHALATION: Persons suffering from lack of oxygen should be removed to fresh air. If victim is not breathing, administer artificial respiration. If breathing is difficult, administer oxygen. Obtain prompt medical attention.

EYE CONTACT: In case of splash contamination, immediately flush eyes with water for at least 15 minutes. See a physician, preferably an ophthalmologist immediately.

SKIN CONTACT: Remove any clothing that may restrict circulation to frozen area. Do not rub frozen parts as tissue damage may result. As soon as practical place the affected area in a warm water bath which has a temperature not to exceed 105°F (40°C). Never use dry heat. In case of massive exposure, remove clothing while showering with warm water. Call a physician as soon as possible.

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Frozen tissue is painless and appears waxy with a possible yellow color. It will become swollen, painful, and prone to infection when thawed. If the frozen part of the body has been thawed by the time medical attention has been obtained, cover the area with dry sterile dressing with a large bulky protective covering.

INGESTION: Not applicable.

NOTES TO PHYSICIAN: Not applicable.

5. FIRE FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION: Nonflammable.

FLAMMABLE LIMITS IN AIR BY VOLUME:

LOWER: Not applicable. **UPPER:** Not applicable.

EXTINGUISHING MEDIA: Nitrogen is nonflammable and does not support combustion. Use extinguishing media appropriate for the surrounding fire.

SPECIAL FIRE FIGHTING INSTRUCTIONS: Nitrogen is a simple asphyxiant. If possible, remove nitrogen cylinders from fire area or cool with water. Do not direct water spray at the container vent. Self-contained breathing apparatus may be required for rescue workers. Evacuate this area.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Liquid nitrogen when spilled will vaporize rapidly forming an oxygen deficient vapor cloud. Evacuate this vapor cloud area. Visibility may be obscured in its vapor cloud. Pressure in a container can build up due to heat and it may rupture if pressure relief devices should fail to function. Contact with cold liquid or gaseous oxygen may cause frostbite.

HAZARDOUS COMBUSTION PRODUCTS: None known.

[SENSITIVITY TO STATIC DISCHARGE]: Not applicable.

[SENSITIVITY TO MECHANICAL IMPACT]: None.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Evacuate all personnel from the affected area. Shut off source of nitrogen, if possible without risk. Ventilate area or remove leaking containers to a well ventilated location. To increase rate of vaporization spray large amounts of water on to the spill from an upwind position. If leaking from container or its valve, contact your supplier.

7. HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation. Do not store in a confined space. Cryogenic containers are equipped with pressure relief devices to control internal pressure. Under normal conditions these containers will periodically vent product. Some metals such as carbon steel may become brittle at low temperatures and will easily fracture. Prevent entrapment of liquid in closed systems or piping without pressure relief devices.

PRECAUTIONS TO BE TAKEN IN HANDLING: Never allow any unprotected part of the body to touch uninsulated pipes or vessels which contain cryogenic fluids. The extremely cold metal will cause the flesh to stick fast and tear when one attempts to withdraw from it.

Use a suitable hand truck for container movement. Containers shall be handled and stored in an upright position. Do not drop or roll containers on their sides. If user experiences any difficulty operating container valve discontinue use, and contact supplier. For additional precautions in using liquid nitrogen see Section 16 - Other Information.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

VENTILATION: Natural or mechanical to prevent oxygen-deficient atmospheres under 19.5% oxygen.

RESPIRATORY PROTECTION (SPECIFY TYPE):

General Use: None required.

Emergency Use: Self-contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmosphere. Respirators will not function.

PROTECTIVE GLOVES: Loose fitting thermal insulated or leather gloves.

EYE PROTECTION: Full face shield and safety glasses are recommended.

OTHER PROTECTIVE EQUIPMENT: Safety shoes when handling containers. Long sleeve shirts and trousers without cuffs.

9. PHYSICAL AND CHEMICAL PROPERTIES

MOLECULAR WEIGHT: 28.01

BOILING POINT (1 ATM): -320.4° F (-195.8° C)

SPECIFIC GRAVITY (Air =1): At 70° F (21.1° C) and 1 atm: 0.967

FREEZING POINT/MELTING POINT: At 1 atm: -345.8° F (-209.9° C)

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VAPOR PRESSURE (AT 20° C): Not applicable

GAS DENSITY: At 70° F (21.1° C) and 1 atm: 0.072 lbs/ft³ (1.153 kg/m³)

EVAPORATION RATE (Butyl Acetate=1): Gas, not applicable.

SOLUBILITY IN WATER: Vol/Vol at 32° F (0° C): 0.023

EXPANSION RATIO: (For liquid to gas) 70°F (21.1°C): 1 to 696.5

[pH]: Not applicable

APPEARANCE, ODOR AND STATE: Colorless, odorless cryogenic liquid.

[COEFFICIENT OF WATER/OIL DISTRIBUTION]: Not available

[ODOR THRESHOLD]: Not applicable

10. STABILITY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID: None

INCOMPATIBILITY (Materials to Avoid): None

REACTIVITY:

A) **HAZARDOUS DECOMPOSITION PRODUCTS:** None

B) **HAZARDOUS POLYMERIZATION:** Will not occur.

11. TOXICOLOGICAL INFORMATION

Nitrogen is a simple asphyxiant.

[IRRITANCY OF MATERIAL]: None.

[SENSITIZATION TO MATERIAL]: None.

[REPRODUCTIVE EFFECTS]: None.

[TERATOGENICITY]: None.

[MUTAGENICITY]: None.

[SYNERGISTIC MATERIALS]: None

12. ECOLOGICAL INFORMATION

The atmosphere contains approximately 78% nitrogen. No adverse ecological effects are expected. Nitrogen does not contain any Class I or Class II ozone depleting chemicals (40 CFR Part 82). Nitrogen is not listed as a marine pollutant by DOT (49 CFR Part 171).

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Contact your supplier.

For emergency disposal, discharge slowly to the atmosphere in a well ventilated area or outdoors.

14. TRANSPORT INFORMATION

DOT/IMO SHIPPING NAME: Nitrogen, Refrigerated Liquid

HAZARD CLASS: 2.2 (Nonflammable Gas)

IDENTIFICATION NUMBER: UN 1977

[PIN]: 1977

PRODUCT RQ: Not applicable

SHIPPING LABEL(s): Nonflammable gas.

PLACARD (When required): Nonflammable gas.

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards and should be discouraged.

15. REGULATORY INFORMATION

The following information concerns selected regulatory requirements potentially applicable to this product. Not all such requirements are identified. Users of this product are responsible for their own regulatory compliance on a federal, state [provincial], and local level.

U.S. FEDERAL REGULATIONS:**EPA - ENVIRONMENTAL PROTECTION AGENCY**

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: Superfund Amendment and Reauthorization Act

Emergency Planning and Notification (SECTIONS 302/304): Requires emergency planning on threshold planning quantities (TPQ) and release reporting based on reportable quantities (RQ) of EPA's extremely hazardous substances (40 CFR Part 355).

Extremely Hazardous Substances: None

Threshold Planning Quantity (TPQ): None

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Hazardous Chemical Reporting (SECTIONS 311/312): Require submission of material safety data sheets (MSDSs) and chemical inventory reporting with identification of EPA defined hazard classes (40 CFR Part 370). The hazard classes for this product are:

IMMEDIATE:	Yes	PRESSURE:	Yes
DELAYED:	No	REACTIVITY:	No
		FIRE:	No

Toxic Chemical Release Reporting (SECTION 313): Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Nitrogen does not require reporting under Section 313

40 CFR PART 68: Risk Management Programs for Chemical Accidental Release Prevention. Requires the development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Nitrogen is not listed as a regulated substance.

TSCA: Toxic Substance Control Act: Nitrogen is listed on the TSCA inventory.

OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR Part 1910.119: Process Safety Management of Highly Hazardous Chemicals. Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals as listed in Appendix A..

Nitrogen is not listed in Appendix A as a highly hazardous chemical.

FDA - FOOD AND DRUG ADMINISTRATION

21CFR 184.1540: Generally recognized as safe (GRAS) as a direct human food ingredient when used as a propellant, aerating agent and gas. Liquid nitrogen NF is regulated by the FDA as a prescription drug.

[CANADIAN REGULATIONS:]

[Controlled Product Hazard Class A. This MSDS has been prepared in compliance with Controlled Product Regulations.]

16. OTHER INFORMATION

SPECIAL PRECAUTIONS: Use piping and equipment adequately designed to withstand pressures to be encountered. Use a check valve or other protective apparatus in any line or piping from the cylinder to prevent reverse flow. **To prevent cryogenic liquids or cold gas from being trapped in piping between valves the piping shall be equipped with pressure relief devices. Only transfer lines designed for cryogenic liquids shall be used. It is recommended that all vents be piped to the exterior of the building.**

Shipment of compressed gas cylinders which have not been filled with the owner's consent is a violation of Federal law (49 CFR Part 173.301(b)).

OTHER INFORMATION:**NFPA RATINGS:**

HEALTH:	= 3
FLAMMABILITY:	= 0
REACTIVITY:	= 0
SPECIAL:	= SA (CGA recommends this to designate simple asphyxiant)

HMIS RATINGS:

HEALTH:	= 3
FLAMMABILITY:	= 0
REACTIVITY :	= 0

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	CGA 295
PIN-INDEXED YOKE:	Not applicable.
ULTRA HIGH INTEGRITY: 0-3000 psig	Not applicable.

Use the proper CGA connections, DO NOT USE ADAPTERS

Further information about nitrogen can be found in the following pamphlets published by: Compressed Gas Association Inc. (CGA), 1725 Jefferson Davis Highway, Suite 1004, Arlington, VA 22202-4102. Telephone: (703)412-0900.

G-10.1	<i>Commodity Specification for Nitrogen</i>
P-9	<i>Inert Gases--Argon, Nitrogen, and Helium</i>
P-12	<i>Safe Handling of Cryogenic Liquids</i>
SB-2	<i>Oxygen-Deficient Atmosphere</i>
AV-1	<i>Safe Handling and Storage of Compressed Gases</i>
AV-5	<i>Safe Handling of Liquefied Nitrogen and Argon</i>

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