1. PRODUCT AND COMPANY IDENTIFICATION

Product Code: 001188
Product Name: NITROGEN, REFRIGERATED LIQUID

Company Name: Gas Innovations
18005 E. Hwy 225
La Porte, TX 77571

Web site address: www.gasinnovations.com

Phone Number: +1 (281)471-2200

Emergency Contact: 3E (within United States) +1 (866)303-2640
+1 (352)323-3500

2. HAZARDS IDENTIFICATION

Flammable Gases:

Gas Under Pressure: **Liquified gas**

Symbol:

GHS Signal Word: **Warning**

GHS Hazard Phrases: H281 - Contains refrigerated gas; may cause cryogenic burns or injury
OSHA-H01 - May displace oxygen and cause rapid suffocation

GHS Precaution Phrases: Do not handle until all safety precautions have been read and understood

Wear cold insulating gloves and face shield. Use and store only outdoors or in a well-ventilated place. Protect from sunlight when ambient temperature exceeds 52°C (125°F)

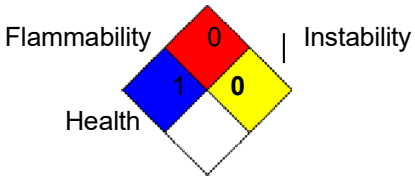
GHS Response Phrases: Thaw frosted parts with lukewarm water. Do not rub affected areas. Get immediate medical advice/attention.

IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF exposed or concerned: Get medical advice/attention

GHS Storage and Disposal Phrases: Store in a well-ventilated place. Use a back flow preventive device in the piping. DO NOT change or force fit connections. Use only with equipment rated for cylinder pressure. Do not open the valve until connected to equipment prepared for use. Close valve after each use and when empty. Always keep the container in upright position. Dispose of contents/container in accordance with local/regional/national/international regulations.

Additional Hazards Information Liquid can cause burns like frostbite

Hazard Rating System:



NFPA: Special Hazard

Potential acute health effects

Eye Contacts Extremely cold material. Liquid can cause burns like frostbite

Inhalation: No known significant effects or critical hazards

Skin Contact: Extremely cold material. Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Ingestion: Ingestion of liquid can cause burns like frostbite

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS #	Hazardous Components (Chemical Name)	Concentration
7727-37-9	NITROGEN, REFRIGERATED LIQUID	100 %

4. FIRST AID MEASURES

Emergency and First Aid Procedures: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

In Case of Inhalation: Remove victims to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous for the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

In Case of Skin Contact: Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. In case of contact with liquid, warm frozen tissues slowly with lukewarm water and get medical attention. Do not rub affected areas. Wash clothing before reuse. Clean shoes thoroughly before reuse. In case of frostbite, spray with water for at least 15 minutes.

In Case of Eye Contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 15 minutes. Get medical attention if irritation occurs.

In Case of Ingestion: Remove victims to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if adverse health effects persist or are severe. Ingestion of liquid can cause burns like frostbite. If frostbite occurs, get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. As this product rapidly becomes a gas when released, refer to the inhalation section.

Signs and Symptoms of Exposure: Adverse symptoms may include the following: frostbite, suffocation

Notes to physician In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media: Use an extinguishing agent suitable for the surrounding fire. Water spray or fog

Unsuitable Extinguishing Media: Do not use water jet to extinguish; icing may occur.

Fire Fighting Instructions: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from the fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile). Damaged cylinders should be handled only by specialists. Stay away from the end of tanks. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.

Flammable Properties and Hazards: Contains gas under pressure. Contains refrigerated gas. In a fire or if heated, a pressure increase will occur, and the container may burst or explode. Decomposition products may include the following materials: nitrogen oxides. Cryogenic liquid causes severe frostbite, a burn-like injury. Heat of fire can build pressure in a closed container and cause it to rupture.

6. ACCIDENTAL RELEASE MEASURES

Protective Precautions, Protective Equipment and Emergency Procedures:

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing gas. Provide adequate ventilation. Wear an appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non- emergency personnel".

Environmental Precautions:

Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Steps To Be Taken in Case Material Is Released or Spilled:

Immediately contact emergency personnel. Stop leaking without risk.

Note: see Section 1 for emergency contact information & section 13 for waste disposal.

7. HANDLING AND STORAGE

Precautions To Be Taken in Handling:

Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Contains refrigerated gas. Do not get in eyes or on skin or clothing. Avoid breathing gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement. Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cryogenic liquids. Prevent entrapment of liquid in closed systems or piping without pressure relief devices. Some materials may become brittle at low temperatures and will easily fracture. Empty containers retain product residue and can be hazardous. Never attempt to lift a cylinder with its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents.

Precautions To Be Taken in Storing:

Store in accordance with local regulations. Store in a segregated and approved area. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F). Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

Other Precautions:

Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; stored and use with adequate ventilation. Never place a container where it may become part of an electrical circuit.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CAS #	Partial Chemical Name	OSHA TWA	ACGIH TWA	NIOSH IDLH
7727-37-9	Nitrogen	-	-	-

Respiratory Equipment (Specify Type):

Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspect of use if there is a risk of contact with the liquid, all protective equipment worn should be suitable for use with extremely low temperature materials.

Eye Protection:

Safety eyewear and face shields complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mist, gases or dust. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields and face shields.

Protective Gloves:	Chemical-resistant, cryogenic gloves complying with an approved standard should be always worn when handling chemical products if a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers.
Body Protection:	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Appropriate footwear and any additional skin protection measures should be selected.
Engineering Controls (Ventilation etc.):	Good general ventilation should be sufficient to control worker exposure to airborne contaminants
Work/Hygienic/Maintenance Practices:	Ensure that eyewash stations and safety showers are close to the workstation location
Environmental exposure control:	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements. In some cases, engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical States:	[X] Gas [ ] Liquid [ ] Solid
Appearance:	Colorless
Odor:	Odorless
Odor Threshold:	Not available.
pH:	Not Available
Melting Point:	-210°C (-346°F)
Boiling Point:	-196 °C
Critical Temperature:	-149.9 °C
Flash Pt:	[Product does not sustain combustion.]
Evaporation Rate:	No data.
Flammability (solid, gas)	No data.
Lower and upper explosive (flammable) limits	Not available.
Vapor pressure	760 mmHg at -196 C
Vapor density	0.967 (Air = 1)
Liquid Density at BP:	50.46 lb./ft3 (808.3 kg/m3)
Specific Volume (ft ^{3}/lb.)	13.8889
Gas Density (lb./ft ^{3})	0.072
Relative density	0.97
Solubility	Not available.
Solubility in Water:	0.8081 at -196 °C
Partition coefficient: n- octanol/water	0.67
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity:	0.292cP
Flow time (ISO 2431)	No data.
Molecular Formula:	N2
Molar mass:	28.01 g/mole

10. STABILITY AND REACTIVITY

Reactivity:	No specific test data related to reactivity is available for this product or its ingredients. Containers may rupture or explode if exposed to heat.
Stability:	Unstable [ ] Stable [X]
Conditions To Avoid - Instability:	Avoid high temp, lithium, neodymium, titanium, magnesium Avoid contact with water or moisture.
Incompatibility Materials to Avoid:	For additional information on compatibility refer to ISO 11114 Metals & oxidizing agent.
Hazardous Decomposition or Byproducts:	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Can react violently with lithium, neodymium, titanium (above 800C), magnesium. Oxides of nitrogen
Possibility of Hazardous Reactions:	Will occur [] Will not occur [X]
Conditions To Avoid - Hazardous Reactions:	Under normal conditions of storage and use, hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity	Not classified.
Irritation / Corrosion	Not classified.
Sensitization	Not classified.
Mutagenicity	Not classified.
Reproductive toxicity:	Not classified.
Teratogenicity:	Not classified.
Specific target organ toxicity (Single Exposure)	Not classified.
Specific target organ toxicity (Repeated Exposure)	Not classified.
Aspiration Hazard:	Not classified.

12. ECOLOGICAL INFORMATION

Toxicity:	No ecological damage caused by this product.
Persistence and Degradability:	No ecological damage caused by this product.
Bio accumulative Potential:	No ecological damage caused by this product.
Mobility in Soil:	No data available.
Other adverse effect:	Can cause frost damage to vegetation.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method:	The disposal of this product should always comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Do not discharge into any place where its accumulation could be dangerous.

14. TRANSPORT INFORMATION

LAND TRANSPORT (US DOT):

DOT Proper Shipping name:	NITROGEN, REFRIGERATED LIQUID
DOT Hazard Class:	2.2
UN/NA number:	UN1977
Labels:	

Sea Transport:

Transport document description (IMDG):

UN-No. (IMDG): UN1997

Proper Shipping Name (IMDG): NITROGEN, REFRIGERATED LIQUID

Class (IMDG): 2.2

Label:

Air Transport:

Transport document description (IATA):

UN-No. (IATA): UN1997

Proper Shipping Name (IATA): NITROGEN, REFRIGERATED LIQUID

Class (IATA): 2.2

Label

15. REGULATORY INFORMATION

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

CAS #	Hazardous Components (Chemical Name)	S. 302 (EHS)	S. 304 RQ	S. 313 (TRI)
7727-37-9	NITROGEN, CRYOGENIC LIQUID			

CAS #	Hazardous Components (Chemical Name)	Other US EPA or State Lists
7727-37-9	NITROGEN, CRYOGENIC LIQUID	Canada: No; EU: Yes; MA: Yes; MN: Yes; NJ: Yes; PA: Yes;

CAS #	Hazardous Components (Chemical Name)	International Regulatory Lists
7727-37-9	NITROGEN, CRYOGENIC LIQUID	Australia: Yes; China: Yes; Korean: Yes; New Zealand: Yes. Philippines: Yes; Mexico: Yes: Taiwan: Yes; JP – ENCS: Yes. KR-KECI: Yes; KR – REACH CCA: NO; VN(Draft): Yes.

16.OTHER INFORMATION

Revision Date: 08/15/2024

Additional Information About This Product: No data available.

NFPA Ratings:

0= Minimal Hazard
1= Slight Hazard
2= Moderate Hazard
3= Serious Hazard
4= Severe Hazard

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