



SAFETY DATA SHEET



Safety Data Sheet

Section 1: Identification

Product identifier

Product Name • Liquid Nitrogen

CAS Number • 7727-37-9

Relevant identified uses of the substance or mixture and uses advised against

Recommended use • Liquid nitrogen has several applications including refrigerating and freezing of perishable foods, cooling of concrete, preservation of biologicals, refrigeration shielding of liquid hydrogen, helium, and neon, as well as many other uses.

Details of the supplier of the safety data sheet

Manufacturer • Dakota Gasification
420 County Road 26
Beulah, ND 58523-9400
United States
www.dakotagas.com

Telephone • 701-873-2100
(General)

Emergency telephone number

Manufacturer • (701) 873-6600

Manufacturer • 800-424-9300 - CHEMTREC

Section 2: Hazard Identification

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

Classification of the substance or mixture

OSHA HCS 2012 • Refrigerated Liquefied Gas - H281
Simple Asphyxiant

Label elements

WARNING



Hazard statements • Contains refrigerated gas; may cause cryogenic burns or injury - H281
 May displace oxygen and cause rapid suffocation.

Precautionary statements

Prevention • Wear cold insulating gloves, face shield and/or eye protection. - P282

Response • Thaw frosted parts with lukewarm water. Do not rub affected area. - P336
 Get immediate medical advice/attention. - P315

Storage/Disposal • Store in a well-ventilated place. - P403

Other hazards

OSHA HCS 2012 • Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite. Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to WHMIS

Classification of the substance or mixture

WHMIS • Compressed Gas - A

Label elements

WHMIS



• Compressed Gas - A

Other hazards

WHMIS • This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.

Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite.

In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients

Substances

Composition					
Chemical Name	Identifiers	%	LD50/LC50	Classifications According to Regulation/Directive	Comments

Product Name: Liquid Nitrogen

Revision Date: 1/23/15

Nitrogen	CAS:7727-37-9	100%	NDA	OSHA HCS 2012: Press. Gas - Refr. Liq.; Simp. Asphyx.	NDA
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Mixtures

- Material does not meet the criteria of a mixture.

Section 4: First-Aid Measures

Description of first aid measures

- Inhalation**
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. If signs/symptoms continue, get medical attention.
- Skin**
- If frostbite has occurred, seek medical attention immediately; do NOT rub the affected area(s) or flush them with water. In order to prevent further tissue damage, do NOT attempt to remove frozen clothing from frostbitten areas. If frostbite has not occurred, immediately and thoroughly wash contaminated skin with soap and water.
- Eye**
- If eye tissue is frozen, seek medical attention immediately; if tissue is not frozen, immediately and thoroughly flush the eyes with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation, pain, swelling, lacrimation or photophobia persist, get medical attention as soon as possible.
- Ingestion**
- If frostbite has occurred, seek medical attention immediately; do NOT rub the affected area(s) or flush them with water. Never give anything by mouth to an unconscious person. Do NOT induce vomiting.

Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

Indication of any immediate medical attention and special treatment needed

- Notes to Physician**
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Other information

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO GASES WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn. Victim(s) who experience any adverse effect after over-exposure to this gas mixture must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the SDS to physician or other health professional with victim(s).

Section 5: Fire-Fighting Measures

Extinguishing media

- Suitable Extinguishing Media**
- Use extinguishing agent suitable for type of surrounding fire.
SMALL FIRES: Dry chemical or CO₂.
LARGE FIRES: Water spray or fog.

- Unsuitable Extinguishing Media**
- No data available

Special hazards arising from the substance or mixture

- Unusual Fire and Explosion Hazards** • Containers may explode when heated.
Ruptured cylinders may rocket.
- Hazardous Combustion Products** • No data available

Advice for firefighters

- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
Always wear thermal protective clothing when handling refrigerated/cryogenic liquids.
Wear positive pressure self-contained breathing apparatus (SCBA).
Move containers from fire area if you can do it without risk.
FIRE: If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.
FIRE INVOLVING TANKS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out.
FIRE INVOLVING TANKS: Do not direct water at source of leak or safety devices; icing may occur.
FIRE INVOLVING TANKS: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
FIRE INVOLVING TANKS: ALWAYS stay away from tanks engulfed in fire.

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

- Personal Precautions** • Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not walk through spilled material. Ventilate the area before entry.
- Emergency Procedures** • Stop leak if you can do it without risk. Keep unauthorized personnel away. Keep out of low areas. Stay upwind. Do not direct water at spill or source of leak. LARGE SPILL: Consider initial downwind evacuation for at least 500 meters (1/3 mile)

Environmental precautions

- Avoid run off to waterways and sewers.

Methods and material for containment and cleaning up

- Containment/Clean-up Measures** • Stop leak if you can do it without risk.
Do not direct water at spill or source of leak.
Use water spray to reduce vapors; do not put water directly on leak, spill area or inside container.
If possible, turn leaking containers so that gas escapes rather than liquid.
Isolate area until gas has dispersed.
Ventilate the area.
Allow substance to evaporate.

Section 7 - Handling and Storage

Precautions for safe handling

- Handling** • Use only with adequate ventilation. Ventilate closed spaces before entering. Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly ventilated area; exposures to fatal concentrations of this gas mixture could occur without any significant warning symptoms, due to olfactory

fatigue or oxygen deficiency. Cylinders should be firmly secured to prevent falling or being knocked-over. Do not attempt to repair, adjust, or in any other way modify cylinders. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. When transferring cryogenic liquids from one container to another, the receiving container should be cooled gradually to prevent thermal shock and to avoid splashing. Cryogenic containers must be made from material suitable for cryogenic temperatures. Some materials become extremely brittle at cryogenic temperatures. Empty containers retain product residue and can be hazardous. Do not cut, weld, puncture or incinerate container.

Conditions for safe storage, including any incompatibilities

Storage • Store in a cool, dry, well-ventilated place. Protect cylinders against physical damage. Cylinders should be firmly secured to prevent falling or being knocked-over.

Section 8 - Exposure Controls/Personal Protection

Control parameters

Exposure Limits/Guidelines • No applicable exposure limits available for product or components.

Exposure controls

Engineering Measures/Controls • Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Equipment

Respiratory • In case of insufficient ventilation, wear suitable respiratory equipment.

Eye/Face • Wear safety glasses.

Skin/Body • Wear leather gloves when handling cylinders. Insulated gloves should always be worn when handling anything that comes in contact with cold liquids and vapor. Gloves should be loose fitting so that they can be removed quickly if liquids are spilled into them. When working with cryogenic liquids it is recommended that clothing be well fitting, yet easy to remove. When working with cryogenic liquids, it is recommended that trousers be worn outside of boots or work shoes. Trousers are recommended without cuffs.

Environmental Exposure Controls • Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

Section 9 - Physical and Chemical Properties

Information on Physical and Chemical Properties

Material Description			
Physical Form	Liquid	Appearance/Description	Colorless liquid with no odor.
Color	Colorless	Odor	Odorless
Odor Threshold	No data available		
General Properties			
Boiling Point	-320 F(-195.5556 C)	Melting Point	-346 F(-210 C)
Decomposition Temperature	No data available	pH	No data available

Specific Gravity/Relative Density	No data available 0.81 @ -195.8C (liquid) 1.0 (gas)	Bulk Density	6.747 lbs/gal liquid at boiling point
Water Solubility	Slightly Soluble 0.023 vol/vol at 32F	Viscosity	No data available
Volatility			
Vapor Pressure	No data available	Vapor Density	0.97 At temperatures which occur just after evaporation from the liquid, the cold saturated vapor is heavier than air and tends to fall.
Evaporation Rate	No data available	Volatiles (Wt.)	0 %
Volatiles (Vol.)	0 %		
Flammability			
Flash Point	No data available	UEL	No data available
LEL	No data available	Autoignition	No data available
Flammability (solid, gas)	No data available		
Environmental			
Octanol/Water Partition coefficient	No data available		

Section 10: Stability and Reactivity

Reactivity

- No dangerous reaction known under conditions of normal use.

Chemical stability

- Stable under normal temperatures and pressures.

Possibility of hazardous reactions

- Hazardous polymerization will not occur.

Conditions to avoid

- Excess heat. Incompatible materials.

Incompatible materials

- May react vigorously with lithium, titanium, neodymium, zirconium, and many other reactive metals.

Hazardous decomposition products

- Nitrogen is non-flammable.

Section 11 - Toxicological Information

Information on toxicological effects

GHS Properties	Classification
Acute toxicity	OSHA HCS 2012•Data lacking
Aspiration Hazard	OSHA HCS 2012•Data lacking
Carcinogenicity	OSHA HCS 2012•Data lacking

Germ Cell Mutagenicity	OSHA HCS 2012•Data lacking
Skin corrosion/Irritation	OSHA HCS 2012•Data lacking
Skin sensitization	OSHA HCS 2012•Data lacking
STOT-RE	OSHA HCS 2012•Data lacking
STOT-SE	OSHA HCS 2012•Data lacking
Toxicity for Reproduction	OSHA HCS 2012•Data lacking
Respiratory sensitization	OSHA HCS 2012•Data lacking
Serious eye damage/Irritation	OSHA HCS 2012•Data lacking

Potential Health Effects

Inhalation

Acute (Immediate) • This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces. If this material is released in a small, poorly ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The following effects associated with decreased levels of oxygen: increase in breathing and pulse rate, emotional upset, abnormal fatigue, nausea, vomiting, collapse, loss of consciousness, convulsive movements, respiratory collapse and death.

Chronic (Delayed) • No data available

Skin

Acute (Immediate) • Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite.

Chronic (Delayed) • No data available

Eye

Acute (Immediate) • Contact with gas or liquefied gas will cause burns, severe injury and/or frostbite.

Chronic (Delayed) • No data available

Ingestion

Acute (Immediate) • Ingestion can cause burns similar to frostbite.

Chronic (Delayed) • No data available

Section 12 - Ecological Information

Toxicity

- Nitrogen makes up the major portion of the atmosphere, 78% by volume. The extreme cold temperature (-196oC) will freeze organisms on contact, but no long-term ecological effects are anticipated.

Persistence and degradability

- Material data lacking.

Bioaccumulative potential

- Material data lacking.

Mobility in Soil

- Material data lacking.

Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

Waste treatment methods

Product waste • Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste • Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	UN number	UN proper shipping name	Transport hazard class(es)	Packing group	Environmental hazards
DOT	UN1977	Nitrogen, refrigerated liquid	2.2	NDA	NDA
TDG	UN1977	NITROGEN, REFRIGERATED LIQUID	2.2	NDA	NDA
IATA/ICAO	UN1977	Nitrogen, refrigerated liquid	2.2	NDA	NDA

Special precautions for user

- None specified.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code • No data available

Section 15 - Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications

- Acute, Pressure(Sudden Release of)

Inventory						
Component	CAS	Canada DSL	Canada NDSL	EU EINECS	EU ELNICS	Korea KECL
Nitrogen	7727-37-9	Yes	No	Yes	No	Yes

Canada

Labor

Canada - WHMIS - Classifications of Substances

•Nitrogen

7727-37-9 A

Canada - WHMIS - Ingredient Disclosure List

•Nitrogen

7727-37-9 Not Listed

Environment

Canada - CEPA - Priority Substances List

•Nitrogen 7727-37-9 Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

•Nitrogen 7727-37-9 Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

•Nitrogen 7727-37-9 Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

•Nitrogen 7727-37-9 Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

•Nitrogen 7727-37-9 Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

•Nitrogen 7727-37-9 Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

•Nitrogen 7727-37-9 Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

•Nitrogen 7727-37-9 Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

•Nitrogen 7727-37-9 Not Listed

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

•Nitrogen 7727-37-9 Not Listed

Inventory - United States - Section 8(b) Inventory (TSCA) - PMN Number to EPA Accession Number Link

•Nitrogen 7727-37-9 Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

•Nitrogen 7727-37-9 Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

•Nitrogen 7727-37-9 Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

•Nitrogen 7727-37-9 Not Listed

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

•Nitrogen 7727-37-9 Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

•Nitrogen 7727-37-9 Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

•Nitrogen 7727-37-9 Not Listed

Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

Other Information

- This product is manufactured and sold under the TSCA PMN exemptions per §720.30 Chemicals not subject to notification requirements.

Section 16 - Other Information

Last Revision Date • 08/January/2015

Preparation Date • 08/January/2015

Disclaimer/Statement of Liability • The information contained in this Safety Data Sheet (SDS) is believed to be correct since it was obtained from sources we believe are reliable. However no representation, guarantees or warranties of any kind are made as to its accuracy, suitability for particular

applications, hazards connected with the use of the material, or the results to be obtained from the use thereof. User assumes all risks and liability of any use, processing or handling of any material, variations in methods, conditions and equipment used to store, handle, or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at his sole discretion. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe work place to examine all aspects of its operation and to determine if or where precautions, in addition to those described herein, are required.

Key to abbreviations

NDA = No Data Available
