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MSDS V1.1	Liquid Nitrogen	DG002L



Label 2.2: Non flammable, non toxic gas.



NFPA RATING

1 IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Trade Name : Nitrogen Liquid
 Chemical Formula : N₂
 MSDS No : DG002L
 Company Identification : Aldakheel Industrial Gases Plant (DIGAS)
 Emergency Phone Number : 04-8455-101

2 COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENT	CAS NUMBER	CONCENTRATION
Nitrogen (Liquid)	7727-37-9	>99%*

*The symbol > means "greater than"

3 HAZARDS IDENTIFICATION

Emergency Overview : **Caution!** Extremely cold liquid and gas under pressure. Can cause rapid suffocation. Can cause severe frostbite. May cause dizziness and drowsiness. Self-contained breathing apparatus and protective clothing may be required by rescue workers.

Effects of a Single (Acute) Overexposure

-Inhalation : Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headache, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconsciousness. Lack of oxygen can kill.

Skin Contact : No harm expected from vapour. Liquid may cause frostbite.

Skin Absorption : No evidence of adverse effects from available information.


Swallowing : Frostbite of the lips and mouth may result from contact with the liquid.

Eye Contact : No harm expected from vapour. Liquid may cause frostbite.

Effects of Repeated (Chronic) Overexposure : No evidence of adverse effects from available information.

Other Effects of Overexposure : Contact with the liquid may cause frostbite.

Medical Conditions Aggravated by Overexposure : The toxicology and the physical and chemical properties of this product suggest that overexposure is unlikely to aggravate medical condition.

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4 FIRST AID MEASURES

Inhalation	: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Skin Contact	: Immediately warm frostbite area with warm water (not to exceed 40 C). In case of massive exposure, remove clothing and shoes while showering with warm water. Get medical attention immediately.
Swallowing	: This product is a gas at normal temperature and pressure.
Eye Contact	: Immediately flush eyes with water for a least 15 minutes. See a physician, preferably an ophthalmologist, immediately.
Notes to Physician	: There is no specific antidote. Treatment of over-exposure should be directed at the control of symptoms and the clinical condition.

5 FIRE-FIGHTING MEASURES


Flammable class	: Non flammable.
Extinguishing media	
Suitable extinguishing media	: All known extinguishants can be used.
Hazardous combustion products	: None.
Specific physical and chemical hazards	: Liquid or vapour cannot catch fire. Container may rupture due to heat of fire. Liquid will freeze water rapidly. Containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature. Liquid causes cryogenic "burns" (frostbite-like injury).
Sensitivity to Impact	: Avoid impact against container.
Sensitivity to Discharge	: Not applicable.
Specific methods	: If possible, stop flow of product. Move away from the container and cool with water from a protected position. If leaking do not spray water onto container. Water surrounding area (from protected position) to contain fire.
Protective equipment and precautions for firefighters	: Firefighters should wear self-contained breathing apparatus and full fire-fighting turnout gear.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions	: Evacuate area. Use protective clothing. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation.
Environmental precautions	: Try to stop release. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
Clean up methods	: Ventilate area.

7 HANDLING AND STORAGE

Precautions to be taken in handling	: Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Electrical equipment must be non-sparking or explosion-proof. Leak check system with soapy water; never use a flame. Never attempt to lift a cylinder by 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. Open valve slowly. If valve is hard to open, discontinue use and contact DIGAS.
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7 HANDLING AND STORAGE (Continued)

Precautions to be taken in storage : Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 52 C. Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls

Local exhaust : Preferred.

Mechanical (General) : Acceptable.

Special : Not applicable.

Other : Not applicable.

Personal protective equipment

Respiratory Protection : Use air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV.


Skin Protection : Loose-fitting cryogenic gloves.

Eye Protection : Wear safety glasses when handling cylinders.

Other Protective Equipment : Metatarsal shoes for cylinder handling. Protective clothing where needed Cuffless trousers should be worn outside the shoes.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Colorless.
Odor	: Odourless.
Odor Threshold	: Odourless.
Physical State	: Liquid.
pH	: Not applicable.
Boiling Point	: -195.8°C (-320.4°F)
Freezing Point	: -209.9°C (-345.8°F)
Evaporation Rate (Butyl Acetate = 1)	: High.
Flammable Limits In Air, % by volume	: Lower Not applicable Upper Not applicable
Vapor Pressure	: Not applicable.
Vapor Density	: 0.00115 g/ml @ 21.1 C
Specific Gravity Liquid (Water =1)	: 0.0808 @ -195.8 C
Specific Gravity Vapor (Air = 1)	: 0.97 g/ml @ 21.1 C
Solubility In Water	: Negligible.
Coefficient of water/oil distribution	: Not applicable.
Autoignition Temperature	: Not applicable.
Percent Volatiles By Volume	: 100% (v/v)
Molecular Weight	: 28.01 g/mole.
Molecular Formula	: N2

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10 STABILITY AND REACTIVITY

Stability	: The product is stable.
Conditions of Chemical Instability	: Elevated temperatures.
Incompatibility (materials to avoid)	: Under certain conditions, nitrogen can react violently with lithium, neodymium, titanium, and magnesium to form nitrides. At high temperature it can also combine with oxygen and hydrogen.
Hazardous Decomposition Products	: None.
Hazardous Polymerization	: Will not occur.
Conditions to Avoid	: None known.
Conditions of Reactivity	: None.

11 TOXICOLOGICAL INFORMATION

Acute Dose Effect	: No specific information is available in our database regarding the other toxic effects of this material to humans.
Study Results	: No known effects.

12 ECOLOGICAL INFORMATION

: No adverse ecological effects expected. This product does not contain any Class I or Class II ozone-depleting chemicals.

13 DISPOSAL CONSIDERATION


Waste Disposal Method	: Do not attempt to dispose of residual or unused quantities. Return cylinder to DIGAS.
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14 TRANSPORT INFORMATION

Transport Information	: Avoid transport on vehicles where the load space is not separated from the driver's compartment.
	: Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
	: Before transporting product containers :
	- Ensure that containers are firmly secured.
	- Ensure cylinder valve is closed and not leaking.
	- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
	- Ensure valve protection device (where provided) is correctly fitted.
	- Ensure there is adequate ventilation.
	- Compliance with applicable regulations.

15 OTHER INFORMATION

May cause frostbite.
Keep container in a well-ventilated place.
Do not breathe the gas.
Ensure all national/local regulations are observed.
Asphyxiant in high concentrations.
The hazard of asphyxiation is often overlooked and must be stressed during operator training.

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15 OTHER INFORMATION (Continued)

HAZARD RATING SYSTEMS:

NFPA Ratings:

Health =3
 Flammability =0
 Instability =0
 Special = SA (CGA recommends this to designate Simple Asphyxiant).

HMIS Ratings:

Health =3
 Flammability =0
 Physical Hazard =2

STANDARD VALVE CONNECTIONS:

THREADED : CGA-295

PIN-INDEX YOKE : Not applicable.

Use the proper CGA connections. **DO NOT USE ADAPTERS.**

This Material Safety Data Sheet has been established for the best knowledge of DIGAS.

Details given in this document are believed to be correct at the best of DIGAS knowledge. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

End of Documents.