

**SAFETY DATA SHEET**Revised edition no : 2
Date : 12/05/2014**Nitrogen (N2)**

PG 018

SECTION 1. IDENTIFICATION OF THE PRODUCT AND COMPANY UNDERTAKING

Trade Name	High Purity, Technical, Ultra High Purity, Instrument Grade
Chemical Family	Inert gas
Chemical Name	Nitrogen
Synonyms	N ₂ , Gaseous Nitrogen, GAN
Chemical Abstract no	7727-37-9
NIOSH No	6700
UN no	1066
Company:	Puregas (Pty) Ltd PO Box 123884, Alrode, 1451, South Africa Tel : (011) 903 9760 Fax: (011) 903 9766 Cellphone: 082 889 6946 (1 st) 082 885 7475 (2 nd) Info@puregas.co.za Emergency Tel: 0800 172 743 (Rapid Spill Response)

SECTION 2. HAZARDS IDENTIFICATION

Main Hazard	Liquid nitrogen is a colourless, odourless, extremely cold liquid and gas under pressure. It can cause rapid suffocation when concentrations are sufficient to reduce oxygen levels below 19.5%. Self-contained breathing apparatus (SCBA) may be required. Contact with liquid or cold vapours can cause severe frostbite. Cold vapours in the air will appear as a white fog due to condensation of moisture. While this may indicate the presence of the gas it should not be used to determine its concentration in the atmosphere. Oxygen concentrations must be monitored in the release area. All cryogenic liquids produce large volumes of gas when they vaporize. One volume of liquid nitrogen will expand to product 696.5 equivalent volumes of gas
Flammability	Non-flammable
Chemical hazard	Nitrogen is relatively inert to most materials under ordinary conditions. It becomes more reactive at elevated temperatures and combines with hydrogen, oxygen and some metals
Biological hazard	No known effect
Reproduction hazard	No data available
Eye effects	Tissue freezing and severe cryogenic burns if contacted into eyes
Health effects – skin	Skin contact with liquid nitrogen can cause tissue freezing, resulting in severe burns. The burns are caused by the extremely low temperature of the cryogenic liquid and not the result of chemical action. Skin may appear red with the formation of blisters. In cases that involve prolonged or severe exposure, tissue

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	may freeze and have a waxy or yellow appearance. If the frozen part of the body has been thawed, cover the area with dry sterile dressing with a large bulky protective covering, pending medical care. In case of massive exposure, remove clothing while showering with warm water. Call a physician
Health effects – ingestion	As nitrogen acts as a simple asphyxiant death may result from errors in judgment, confusion, or loss of consciousness which prevents self-rescue. At low oxygen concentrations, unconsciousness and death may occur in seconds without warning
Health effects – inhalation	Inhalation of nitrogen in excessive concentrations can result in dizziness, nausea, vomiting, loss of consciousness and death. As nitrogen acts as a simple asphyxiant death may result from errors in judgment, confusion, or loss o consciousness which prevents self-rescue. At low oxygen concentrations, unconsciousness and death may occur in seconds without warning
Carcinogenicity	Nitrogen is not listed as a carcinogen
Mutagenicity	No known effect
Neurotoxicity	No known effect

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS	
Hazardous components	Gas
EEC Classification	No data available
R Phrases	No data available

SECTION 4. FIRST AID MEASURES	
Eye contact	For exposure to liquid, immediately warm frostbite area with warm water (not to exceed 40°C)
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 exceeding (40°C)? Never use dry heat. Call a physician as soon as possible.
Ingestion	Prompt medical attention is mandatory in all cases of overexposure to Nitrogen. Rescue personnel should be equipped with self-contained breathing apparatus. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be removed to an uncontaminated area and given mouth-to-mouth resuscitation and supplemental oxygen
Inhalation	Prompt medical attention is mandatory in all cases of overexposure to Nitrogen. Rescue personnel should be equipped with self-contained breathing apparatus. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important.

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	Unconscious persons should be removed to an uncontaminated area and given mouth-to-mouth resuscitation and supplemental oxygen
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SECTION 5. FIRE-FIGHTING MEASURES	
Extinguishing Media	As Nitrogen is an inert gas, it does not contribute to a fire, but could help with the extinguishing by reducing the oxygen content of the air by dilution to below the level to support combustion
Special Hazards	Nitrogen does not support life. It can act as a simple asphyxiant by diluting the concentration of oxygen in the air below the levels to support life
Protective Clothing	<p>If possible shut off the source of excess Nitrogen. Evacuate area. All cylinders should be removed from the vicinity of the fire. Cylinders that cannot be removed should be cooled with water from a safe distance. Cylinders which have been exposed to excessive heat should be clearly identified and returned to supplier</p> <p>Fire fighters should wear self-contained breathing apparatus. Safety gloves and shoes, or boots, should be worn when handling cylinders</p> <p>Nitrogen is lighter than air and disperses rapidly in the atmosphere. Care should be taken when entering a potentially oxygen-deficient environment. If possible ventilate the affected area</p>

SECTION 6. ACCIDENTAL RELEASE MEASURES	
Personal Precautions	Do not enter any area where nitrogen has been spilled unless tests have shown that it is safe to do so. Evacuate all personnel from affected area. Increase ventilation to release area and monitor oxygen level. Use appropriate protective equipment. To increase rate of vaporization spray large amounts of water on to the spill from an upwind position. Do not spray water direct at leak. If leak is from container or its valve, call the Puregas emergency telephone number.
Environmental Precautions	Nitrogen does not pose a hazard to the environment
Small spills	Shut off the source of escaping nitrogen. Ventilate the area
Large spills	Evacuate the area. Shut off the source of the spill if this can be done without risk. Restrict access to the area until completion of the clean-up procedure. Ventilate the area using forced-draught if necessary

SECTION 7. HANDLING AND STORAGE	
Suitable material	No data available
Handling/storage precautions	<p>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. Do not plug, remove, or tamper with pressure relief device.</p> <p>Never allow any unprotected part of the body to touch un-insulated 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.</p>

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	<p>Use a suitable hand truck for container movement. Containers shall be handled and stored in an upright position. Do not drop, tip or roll containers on their sides. Do not remove or interchange connections. If user experiences any difficulty operating container valve or with container connections discontinue use and contact supplier. Use the proper connection. Do not use adapters.</p> <p>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. Some metals such as carbon steel may become brittle at low temperatures, will easily fracture and should not be used with cryogenic liquids. It is recommended that all vents be piped to the exterior of the building</p> <p>Some metals such as carbon steel, may become brittle and fracture at low temperatures</p>
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SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure limits	As Nitrogen is a simple asphyxiant, avoid any areas where spillage has taken place. Only enter once testing has proved the atmosphere to be safe
Engineering control measures	Engineering control measures are preferred to reduce exposure to Oxygen-depleted atmospheres. General methods include forced-draught ventilation separate from other exhaust ventilation systems. Ensure that sufficient fresh air enters at or near floor level
Personal protection – respiratory	Self-contained breathing apparatus (SCBA) or positive pressure airline with mask and escape pack should always be worn when entering area where oxygen depletion may have occurred. Respirators will not function
Personal protection – hand.	Those working with liquid nitrogen should wear approved insulation gloves or safety gloves
Personal protection – eye	Those working with liquid nitrogen should wear safety glasses and face shield
Personal protection – skin	Wear protective clothing, as required by use conditions to prevent any skin contact with liquid nitrogen. Cuffless trousers should be worn outside high-topped shoes. Safety shoes are recommended for those handling cylinders of gases. Use air-supplied or self-contained breathing apparatus
Other protection	Contact lenses pose a special hazard, soft lenses may absorb irritants, and all lenses concentrate them

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Colourless cryogenic liquid Odour: Odourless pH: No data available Boiling point: –195.8°C Melting point: -209.9°C	Explosive properties: No data available Oxidizing properties: No data available Vapour pressure: Not applicable Density: Gas – at 21.1°C and 1 Atm : 0.072 lbs/cu ft (1.153 kg/m3)
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Flash point: Not found Flammability: Non-flammable Autoflammability: Not found	Solubility - water: Vol/Vol at 0°C : 0.023 Solubility - solvent: No data available Solubility - coefficient : No data available
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SECTION 10. STABILITY AND REACTIVITY	
Conditions to Avoid	The dilution of the oxygen concentration in the atmosphere to levels which cannot support life. Never use cylinders as rollers or supports or for any other purpose than the storage of Nitrogen. Never expose cylinders to excessive heat, as this may cause sufficient build-up of pressure to rupture the cylinders.
Incompatible materials	As Nitrogen is inert it may be contained in systems constructed of any of the common metals which have been designed to safely withstand the pressures involved
Hazardous decomposition products	No data available

SECTION 11. TOXICOLOGICAL INFORMATION	
Acute toxicity	Nitrogen is a simple asphyxiant
Skin and eye contact	Nitrogen is a simple asphyxiant
Chronic toxicity	Nitrogen is a simple asphyxiant
Carcinogenicity	No known effect
Mutagenicity	No known effect
Reproductive hazards	No known effect

SECTION 12. ECOLOGICAL INFORMATION	
Aquatic toxicity – fish	Nitrogen is lighter than air and can cause pockets of oxygen depleted atmosphere in low-lying areas. It does not pose a hazard to the ecology
Aquatic toxicity – daphnia	Nitrogen is lighter than air and can cause pockets of oxygen depleted atmosphere in low-lying areas. It does not pose a hazard to the ecology
Aquatic toxicity – algae	Nitrogen is lighter than air and can cause pockets of oxygen depleted atmosphere in low-lying areas. It does not pose a hazard to the ecology
Biodegradability	Nitrogen is lighter than air and can cause pockets of oxygen depleted atmosphere in low-lying areas. It does not pose a hazard to the ecology
Bio-accumulation	Nitrogen is lighter than air and can cause pockets of oxygen depleted atmosphere in low-lying areas. It does not pose a hazard to the ecology

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Mobility German wgk	No data available
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SECTION 13. DISPOSAL CONSIDERATIONS	
Disposal methods	For emergency disposal, discharge slowly to the atmosphere in a well-ventilated area or outdoors.
Disposal packaging	The disposal of cylinders must only be handled by the gas supplier

SECTION 14. TRANSPORT INFORMATION	
UN no: 1066 ADR/RID Substance identity no: 1066 ADR/RID class: 2.2 ADR/RID item no: 2,1a ADR/RID hazard identity no: 20 IMDG - shipping name: Nonflammable gas IMDG - class: 2.2 IMDG - packaging group: No data available IMDG - marine pollutant: No data available	IMDG - EMS No: No data available IMDG - MFAG table on : No data available IATA – class : 2.2 IATA - subsidiary risk(s): No data available UK - description: No available data UK emergency action class: No available data UK classification: No available data Tremcard No: TEC(R)20G01

SECTION 15. REGULATORY INFORMATION
EEC hazard classification : Non flammable Risk phrases : R20 – Harmful by inhalation R44 – Risk of explosion if heated under confinement Safety phrases : S2 – Keep out of reach of children S9 – Keep container in a well-ventilated place S15 – Keep away from heat S27 – Wear suitable gloves S38 – In case of insufficient ventilation, wear suitable respiratory equipment S51 – Use only in well-ventilated areas National Legislation : <i>OSH Act, National Road Traffic Act (when promulgated)</i>

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SECTION 16. OTHER INFORMATION

SELECTED BIBLIOGRAPHY

1. Data sheets as supplied by various Suppliers and Manufacturers
2. Emergency Response Handbook - Annex A of SABS 0232-3
3. Handling Chemicals Safety, 2nd. Ed. Dutch Association of Safety Experts, Dutch Chemical Industry Association, Dutch Safety Institute, 1980
4. NIOSH Pocket Guide to Chemical Hazards, NIOSH, June 1990
5. Micromedex, Inc. TOMES CPS™ System Vol. 39
6. Patty's Industrial Hygiene Toxicology, 4th ed. Vol. II Part A, George D Clayton, Florence E Clayton
7. Supplement to NIOSH Manual of Analytical Methods, 3rd ed., NIOSH Publication No 84-100, 1985
8. Toxic & Hazardous Industrial Safety Manual - Industrial Chemicals Safety Manual for Handling and disposal with toxicity and hazard data
9. WinSpirs 2.1 as supplied by the Canadian Centre for Occupational Health and Safety.

All reasonable care has been exercised in processing your request for information on the chemical listed in this Material Safety Data Sheet. No warranty is made, either express or implied and Perisseuma Projects does not hold itself liable for any injury, illness, loss or misinterpretation arising from the use of this data.