

Nitrogen Material Safety Data Sheet

ISSUE DATE	01 March 2016	TRADE NAME AND SYNONYMS Nitrogen , or LIN (in cryogenic liquid state)	CHEMICAL NAME AND SYNONYMS Nitrogen
REVISIONS	V1-02.2016	FORMULA N ₂ MW : 28.01	CHEMICAL FAMILY Inert Gas CAS #7727-37-9

HEALTH HAZARD DATA

EXPOSURE LIMITS

OSHA : None established. ACGIH : Simple Asphyxiant. Nitrogen is not listed as a carcinogen by NTP , IARC or OSHA.

SYMPTOMS IF INGESTED , CONTACTED WITH SKIN , OR VAPOR INHALED

Nitrogen is odorless and nontoxic , but may produce suffocation by diluting the concentration of oxygen in air below levels necessary to support life. PERSONNEL , INCLUDING RESCUR WORKERS , SHOULD NOT ENTER AREAS WHERE THE OXYGEN CONCENTRATION IS BELOW 19.5% , UNLESS PROVIDED WITH A SELF-CONTAINED BREATHING APPARATUS OR AIRLINE RESPIRATOR. Expose to oxygen-deficient atmospheres may produce dizziness , nausea , vomiting , loss of consciousness and death. Death may result from errors in judgement , confusion , or loss of consciousness which prevents self-rescue. At low oxygen concentrations unconsciousness and death may occur in seconds without warning. Extensive tissue damage or burns can result from exposure to liquid nitrogen or cold nitrogen vapors.

TOXICOLOGICAL PROPERTIES

Nitrogen is a simple asphyxiant and constitutes 78% of the air we breathe. Nitrogen does not support life and may produce immediately hazardous atmosphere through the displacement of oxygen. Nitrogen under high pressure can produce narcosis even though oxygen sufficient for life is present.

RECOMMENDED FIRST AND TREATMENT

Persons suffering from lack of Oxygen should be moved to areas with normal atmosphere. SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED TO PREVENT ASPHYXIATION OF RESCUE WORKERS. Assited respiration and supplemental oxygen should be given if the victim is not breathing. If cryogenic liquid or cold boil-off gas contacts a worker's skin or eyes , frozen tissues should be flooded or soaked with tepid water (105 - 115F; 41-46C). DO NOT USE HOT WATER. Cryogenic burns which result in blistering or deeper tissue freezing should be seen promptly by a physician.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used)	AUTO IGNITION TEMP	FLAMMABLE LIMITS	LEL	UEL
N/A	N/A	Non-flammable	N/A	N/A
EXTINGUISHING MEDIA	ELECTRICAL CLASSIFICATION GROUP			
N/A	N/A			

SPECIAL FIRE FIGHTING PROCEDURES

N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS

Cylinders exposed to high heat or flame may vent rapidly.

PHYSICAL DATA

BOILING POINT (°F)	FREEZING POINT (°F)		
@ 1 atm - 320.5F (-195.8 C)	@ 1 atm - 346.0F (-210.0C)		
VAPOR PRESSURE (psia)	SOLUBILITY IN WATER		
N/A	@ 68F (20C) , 1 atm 1.52% by volume		
VAPOR DENSITY (lb/cu ft)	SPECIFIC GRAVITY (AIR = 1)	LIQUID DENSITY (lb/uc ft)	SPECIFIC GRAVITY (H2O=1)
@ 70F (21.1C) , 1 atm 0.07245	@ 68F (20C) , 1 atm 0.967	@ boiling point , 1 atm 50.47	@ boiling point , 1 atm 0.808

APPEARANCE AND ODOR

Both liquid and gaseous nitrogen are colorless and odorless.

REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID
Inert	STABLE	X	None
INCOMPATIBILITY (Materials to avoid)			HAZARDOUS DECOMPOSITION PRODUCTS
None			None
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	None
SPILL OR LEAK PROCEDURES			
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED			
Avoid contact of skin with liquid nitrogen or its cold boil-off gas. Flush liquid nitrogen spill with water to disperse. Ventilate enclosed areas to prevent formation of oxygen-deficient atmosphere caused by the evaporation of liquid nitrogen or the release of gaseous nitrogen.			
WASTE DISPOSAL METHOD			
Allow liquid nitrogen to evaporate in a well ventilated outdoor location remote from work areas. Vent nitrogen gas slowly to a well ventilated outdoor location remote from work areas. Do not attempt to dispose residual nitrogen in compressed gas cylinders. Return cylinders with residual pressure. Cylinder valve tightly closed and valve caps in place.			
SPECIAL PROTECTION INFORMATION			
RESPIRATORY PROTECTION (Specify Type)			
Use self-contained breathing apparatus in oxygen-deficient atmosphere. Caution! Respirators will not function. Use may result in asphyxiation.			
VENTILATION	LOCAL EXHAUST	SPECIAL	
Natural or mechanical	As necessary	As necessary	
where gas or vapors are present	MECHANICAL (General)	OTHER	
	As necessary	Vents should be situated to avoid higher than normal concentration of nitrogen in work areas.	
PROTECTIVE GLOVES			
(LIN) Loose-fitting gloves of impermeable material , such as leather. Leather work gloves are recommended when handling compressed gas cylinders.			
EYE PROTECTION			
(LIN) Chemical goggles or safety glasses. Safety glasses are recommended when handling high pressure cylinders			
OTHER PROTECTIVE EQUIPMENT			
None			
SPECIAL PRECAUTIONS *			
SPECIAL LABELLING INFORMATION			
DOT Shipping Name : Nitrogen or Nitrogen , Compressed ; (LIN) Nitrogen , refrigerated liquid.			
DOT Hazard Class : Non-flammable Gas DOT Shipping label : Non-flammable Gas.			
I.D. number : UN 1066 (Nitrogen , or Nitrogen , Compressed) ; UN 1977 (LIN)			
SPECIAL HANDLING RECOMMENDATIONS			
Prevent contact of liquid nitrogen or cold boil-off gas with exposed skin. Prevent entrapment of liquid in closed systems. Use only in well ventilated areas. Compressed gas cylinders contain nitrogen at extremely high pressure and should be handled with care. Use a pressure reducing regulator and pressure relief devices when connecting to lower pressure piping systems. Secure cylinders when in use. Never use direct flame to heat a compressed gas cylinder. Use a check valve to prevent back-flow into storage container. Avoid dragging rolling , or sliding cylinders , even for a short distance. Use a suitable hand truck.			
SPECIAL STORAGE RECOMMENDATIONS			
It is recommended that liquid cylinders be stored outside and the gas or liquid piped to the use point. However , if liquid cylinders are to be stored or transported in an enclosed area , it is essential that the area be well ventilated. In case of poor natural ventilation , forced ventilation should be installed. Keep cylinders away sources of heat. Storage should not be in heavy areas to prevent accidental knocking over or damage from passing or falling objects. Valve caps should remain on cylinders not connected for use. Segregate full and empty cylinders. Storage areas should be free of combustible material. Replace the cylinder cap when the cylinder is not in use. Avoid exposure to areas where salt or other corrosive chemicals are present.			
OTHER RECOMMENDATIONS OR PRECAUTIONS			
Liquid nitrogen is cryogenic liquid. Materials of construction must be selected for compatibility with extremely low temperatures. Avoid use of carbon steel and other materials which become brittle at low temperature . Compressed gas cylinders should not be refilled except by qualified producers of compressed gases.			