NorLAB
A DIVISION OF NORCO, INC.

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Butane 0.0001% to 10% in Nitrogen

MATERIAL SAFETY DATA SHEET

Identification

Product Name: Butane 0.0001% to 10% in Nitrogen
Chemical Name: Butane in Nitrogen
Chemical Family: Gas Mixture
CAS Number: N/A
Common Names/Synonyms: N/A
MSDS Identification Code/Number: 2020
Prepared by: Quality Dept.

Revision Date: 03/26/04
Last Review Date: 03/04/13

Composition, Information on Ingredients, Exposure Limits

Exposure Limits[1]

Ingredient	% Volume	PEL-OSHA[2]	TLV-ACGIH[3]	LD_{50} or LC_{50} Route/Species
Butane Formula: C_4H_{10} CAS: 106-97-8 RTECS#: EJ4200000	0.0001 to 10%	Not Available	10000 PPM TWA	276,470 PPM Inhalation/rat (4 H)
Nitrogen Formula: N_2 CAS: 7727-37-9 RTECS#: QW9700000	90.0 to 99.9999%	None Established	Simple Asphyxiant	Not Available

[1] Refer to individual state or provincial regulations, as applicable, for limits that may be more stringent than those listed here.
[2] As stated in 29 CFR 1910, Subpart Z (revised July1, 1993)
[3] As stated in the ACGIH 2007 Threshold Limit Values for Chemical Substances and Physical Agents

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

Hazards Identification

Emergency Overview:

Simple Asphyxiant – This product does not contain oxygen and may cause asphyxia if released in a confined area. High concentrations of butane may have central nervous system effect. Maintain oxygen levels above 19.5%. Contents under pressure. Use and store below 125 ^{O}F (52^{0}C). Nonflammable when butane concentration is less than 5.6%, flammable if above 5.6% (CGA Pamphlet P-23 2003).

Route of Entry:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
No	No	No	Yes	No

Health Effects:

Exposure Limits	Irritant	Sensitization
Yes	No	No
Teratogen	Reproductive Hazard	Mutagen
No	No	No
Synergistic Effects None reported		

Hazards Identification Continued

Carcinogenicity: NTP: No IARC: No OSHA: No

Eye Effects:
Contact with rapidly expanding gas near the point of release may cause frostbite.

Skin Effects:
Contact with rapidly expanding gas near the point of release may cause frostbite with redness, skin color change to gray or white, and blistering.

Ingestion Effects:
None known. Ingestion is unlikely as product is a gas at room temperature.

Inhalation Effects:
Inhalation of butane vapors may cause dizziness, headache and nausea. High concentrations may depress the central nervous system, causing a loss of consciousness and respiratory paralysis.

Product is a simple asphyxiant. High concentrations may exclude an adequate supply of oxygen to the lungs. Effects of oxygen deficiency resulting from simple asphyxiants may include: rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgment, depression of all sensations, emotional instability, and fatigue. As asphyxiation progresses, nausea, vomiting, prostration, and loss of consciousness may result, eventually leading to convulsions, coma, and death.

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

Medical Conditions Aggravated by Exposure: None known.

NFPA Hazard Codes		**HMIS Hazard Codes**		**Ratings System**
Health:	0	Health:	0	0: No Hazard
Flammability:	1	Flammability:	1	1: Slight Hazard
Instability:	0	Physical Hazard:	3	2: Moderate Hazard
				3: Serious Hazard
				4: Severe Hazard

Hazard ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2004, *CGA Recommended Hazard Ratings for Compressed Gases, 2nd Edition.*

First Aid Measures

Eyes:
None required for gas. If frostbite is suspected, flush eyes with cool water for 15 minutes and obtain immediate medical attention.

Skin:
None required for gas. For frostbite, immerse skin in lukewarm water. DO NOT USE HOT WATER. Obtain medical attention.

Ingestion:
None required.

Inhalation:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area and, if breathing has stopped, administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

Fire Fighting Measures

Conditions of Flammability: Flammable gas when butane concentration > 5.6%		
Flash Point: Not Available	Method: Not Available	Autoignition Temperature: Not Available
LEL % Butane in Air 1.9%	UEL % Butane in Air 8.5%	
Hazardous Combustion Products: None		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

Fire and Explosion Hazards:
Butane is heavier than air. Gas may accumulate in areas with inadequate ventilation, possibly forming an explosive atmosphere. Butane concentrations > 5.6% in nitrogen are flammable (CGA P-23, 2003). Use adequate ventilation to prevent gas buildup.

Extinguishing Media:
Carbon Dioxide, dry chemical or water spray.

Fire Fighting Instructions:
If possible, stop the flow of gas supply. Use water spray to cool adjacent cylinders and areas. Fire fighters should wear a full-facepiece NIOSH/MSHA approved self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout gear.

Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or valve, contact the appropriate emergency telephone number listed in section 1or call your closest Norco/NorLab location.

Handling and Storage

Gas mixture is non-corrosive and may be used with any common structural material.

Use only in well-ventilated areas. Valve protection caps must remain in place unless the cylinder is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure regulator when connecting cylinder to lower pressure (<3000 PSIG) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous backflow into the cylinder.

Protect cylinders from physical damage. Store in a cool, dry, well ventilated area of non-combustible construction away from heavy traffic areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed $125^{O}F$ ($52^{0}C$). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in – first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Post "NO SMOKING OR OPEN FLAMES" sign in the storage or use area.

For additional recommendations, consult Compressed Gas Association Pamphlets P-1, P-9, and Safety Bulletin SB-2.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid from in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

Exposure Controls, Personal Protection

Engineering Controls:
Local exhaust to prevent accumulation of high concentrations and maintain atmospheric oxygen at or above 19.5%.

Eye/Face Protection:
Safety goggles or glasses as appropriate for the job.

Exposure Controls, Personal Protection Continued

Skin Protection:
Protective gloves of material appropriate for the job.

Respiratory Protection:
Positive pressure air line with full-face mask and escape bottle or self-contained breathing apparatus should be available for emergency use.

Other/General Protection:
Safety shoes.

Physical and Chemical Properties

Parameter	Value	Units
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure	: Not Available	
Vapor density (Air = 1)	: Not Available	
Evaporation point	: Not Available	
Boiling point	: Not Available	
Freezing point	: Not Available	
pH	: Not Applicable	
Specific gravity	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H_2O)	: Negligible	
Odor threshold	: Not Applicable	
Odor and appearance	: Colorless, odorless gas	

Stability and Reactivity

Stability:
Stable

Incompatible Materials:
None

Hazardous Polymerization:
Does not occur.

Toxicological Information

Butane and nitrogen are simple asphyxiants. Oxygen levels should be maintained at greater then 19.5% at normal atmospheric pressure which is equivalent to a partial pressure of 135 mm Hg.

High concentrations of Butane in Nitrogen gas mixture so as to exclude adequate supply of oxygen to the lungs causes dizziness, deeper breathing due to air hunger, possible nausea and eventual unconsciousness.

Butane and nitrogen are relatively inactive biologically and essentially nontoxic. However, high concentrations of butane may have a narcotic like effect. Therefore, the major hazard is the exclusion of an adequate supply of oxygen to the lungs.

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

No data given in the Registry of Toxic Effects of Chemical Substances (RTECS or Sax, Dangerous Properties if Industrial Materials, 7^{th} ed.

Ecological Information

Product does not contain Class I or Class II ozone depleting substances. Not toxic. Will not bioconcentrate

Disposal Considerations

Do not attempt to dispose of waste or unused quantities in returnable cylinders. Return in the shipping container, properly labeled, with any valve outlet plugs or caps secure and valve protection cap in place, to Norco or NorLab for proper disposal. Non-refillable containers should be vented in a well ventilated area then disposed of in accordance with local regulations, or returned to NorLab.

Transport Information

Parameter	US DOT & Canada TDG Butane < 5.6%	US DOT & Canada TDG Butane >5.6%
Proper Shipping Name:	Compressed gases, N.O.S., (Butane in Nitrogen)	Compressed gases, flammable, N.O. S., (Butane in Nitrogen)
Hazard Class:	2.2	2.1
Identification Number:	UN 1956	Un 1954
Shipping Label:	Nonflammable Gas	Flammable Gas

Regulatory Information

SARA Title III Notifications and Information:
Butane is listed under the accident prevention provisions of section 112(r) of the Clean Air Act (CAA) with a threshold quantity (TQ) of 10,000 pounds.

SARA Title III – Hazard Classes:
Sudden Release of Pressure Hazard

SARA Title III – Section 313 Supplier Notification:
This product does not contain toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and 40 CFR 372.

California Proposition 65: This product does not contain ingredient(s) known to the State of California to cause cancer or reproductive toxicity.

Other Information

ACGIH	American Conference of Governmental Industrial Hygienists
DOT	Department of Transportation
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

Disclaimer of Expressed and Implied Warranties:
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