

**HONG KONG SPECIALTY GASES CO., LTD.**

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**MATERIAL  
SAFETY  
DATA SHEET**

<b>PRODUCT NAME</b> Normal Butane	<b>CAS#</b> 106-97-8
<b>TRADE NAME AND SYNONYMS</b> Normal Butane, Butane, n-Butane	<b>DOT I.D. NO.</b> UN 1011
<b>CHEMICAL NAME AND SYNONYMS</b> Normal Butane (D.O.T.)	<b>DOT HAZARD CLASS</b> Division 2.1
<b>ISSUE DATE AND REVISIONS</b> Revised March 2001	<b>FORMULA</b> n-C <sub>4</sub> H <sub>10</sub>
	<b>CHEMICAL FAMILY</b> Aliphatic Hydrocarbon

**HEALTH HAZARD DATA**

<b>TIME WEIGHTED AVERAGE EXPOSURE LIMIT</b>  TWA = 800 Molar PPM (ACGIH 1994-1995). No PEL (8 hours TWA) listed by OSHA 1993.
<b>SYMPTOMS OF EXPOSURE</b>  Effects of exposure to high concentrations so as to displace the oxygen in the air necessary for life are headache, dizziness, labored breathing and eventual unconsciousness. Also, it is a narcotic which acts as a depressant on the central nervous system. Contact with the rapidly evaporating liquid can cause frostbite or cryogenic "burns".
<b>TOXICOLOGICAL PROPERTIES</b>  Breathing high concentrations causes a narcotic effect; however, the major property is the exclusion of an adequate supply of oxygen to the lungs. Frostbite effects are a change in color of the skin to gray or white, possibly followed by blistering. Normal butane is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen. Persons in ill health where such illness would be aggravated by exposure to normal butane should not be allowed to work with or handle this product.
<b>RECOMMENDED FIRSTAID TREATMENT</b>  PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO BUTANE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. <u>Inhalation:</u> 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 moved to an uncontaminated area, given assisted respiration and supplemental oxygen. Further treatment should be symptomatic and supportive. <u>Dermal Contact or Frostbite:</u> Remove contaminated clothing and flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physician should see the patient promptly if the cryogenic "burn" has resulted in blistering of the dermal surface or deep tissue freezing.

## HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

Normal butane is flammable in air.
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## PHYSICAL DATA

<b>BOILING POINT</b> 31.1°F	<b>LIQUID DENSITY AT BOILING POINT</b> 600.7 kg/m <sup>3</sup>
<b>VAPOR PRESSURE @ 70 °F</b> 31.0 psia	<b>GAS DENSITY AT 70 °F, 1 atm</b> 2.484 kg/m <sup>3</sup>
<b>SOLUBILITY IN WATER</b> Very slightly	<b>FREEZING POINT</b> -217°F
<b>EVAPORATION RATE</b> N/A (Gas)	<b>SPECIFIC GRAVITY (AIR=1)</b> 2.07 @ 70°F
<b>APPEARANCE AND ODOR</b> Colorless, liquefied gas with very slight hydrocarbon odor.	

## FIRE AND EXPLOSION HAZARD DATA

<b>FLASH POINT (Method used)</b> -101 °F (Closed Cup)	<b>AUTO IGNITION TEMPERATURE</b> 788 °F	<b>FLAMMABLE LIMITS % BY VOLUME</b> LEL 1.8 UEL 8.4
<b>EXTINGUISHING MEDIA</b> Water, carbon dioxide, dry chemical		<b>ELECTRICAL CLASSIFICATION</b> Class 1, Group D
<b>SPECIAL FIRE FIGHTING PROCEDURES</b> If possible, stop the flow of normal butane. Use water spray to cool surrounding containers.		
<b>UNUSUAL FIRE AND EXPLOSION HAZARDS</b> Normal butane is heavier than air and may travel a considerable distance to a source of ignition. Should flame be extinguished and flow of gas continue, increase ventilation to prevent flammable mixture formation in low areas or pockets.		

## REACTIVITY DATA

<b>STABILITY</b>		<b>CONDITIONS TO AVOID</b>
Unstable		High temperatures. Normal butane begins to decompose at 815 °F.
Stable	X	
<b>INCOMPATIBILITY (Materials to avoid)</b> Oxidizers		
<b>HAZARDOUS DECOMPOSITION PRODUCTS</b> None		
<b>HAZARDOUS POLYMERIZATION</b>		<b>CONDITIONS TO AVOID</b>
May Occur		N/A
Will Not Occur	X	

## SPECIAL PROTECTION INFORMATION

<b>RESPIRATORY PROTECTION (Specify type)</b> Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.	
<b>VENTILATION</b> Hood with forced ventilation.	<b>SPECIAL</b> N/A
<b>MECHANICAL (Gen.)</b> In accordance with electrical codes.	<b>OTHER</b> N/A
<b>LOCAL EXHAUST</b> To prevent accumulation above the TWA.	
<b>PROTECTIVE GLOVES</b> Plastic or rubber	<b>EYE PROTECTION</b> Safety goggles or glasses
<b>OTHER PROTECTIVE EQUIPMENT</b> Safety shoes, safety shower, eyewash "fountain".	

## SPILL OR LEAK PROCEDURES

### STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in container or container valve, contact HSG for special advice.

### WASTE DISPOSAL METHOD

Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to your supplier. For emergency disposal assistance, contact HSG for special advice.

## SPECIAL PRECAUTIONS\*

### SPECIAL LABELING INFORMATION

DOT Shipping Name: Butane

DOT Shipping Label: Flammable Gas

DOT Hazard Class: Division 2.1

I.D. No.: UN 1011

### SPECIAL HANDLING RECOMMENDATIONS

Use only in well-ventilated areas. Valve protection caps must remain in place unless container 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 reducing regulator when connecting cylinder to lower pressure (<250 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 back flow into the cylinder.

### SPECIAL STORAGE RECOMMENDATIONS

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F. 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 being stored for excessive periods of time.

### SPECIAL PACKING RECOMMENDATIONS

Normal butane is noncorrosive and may be used with any common structural material.

### OTHER RECOMMENDATIONS OR PRECAUTIONS

Earth-ground and bond all lines and equipment associated with the normal butane system. Electrical equipment should be non-sparking or explosion proof. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Law.

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