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MATERIAL SAFETY DATA SHEET

No. 009

PRODUCT NAME 1,3 Butadiene	CAS # 106-99-0
TRADE NAME AND SYNONYMS Butadiene, Biethylene	DOT I.D. No.: UN 1010; RQ 1.0 (0.454)
	DOT Hazard Class: Division 2.1
CHEMICAL NAME AND SYNONYMS Butadiene, inhibited (D.O.T.)	Formula C ₄ H ₆ or CH ₂ CHCHCH ₂
	Chemical Family: Diolefin
ISSUE DATES AND REVISIONS Revised January 1995	

HEALTH HAZARD DATA

<p>TIME WEIGHTED AVERAGE EXPOSURE LIMIT TWA = 2 Molar PPM with an A2 carcinogen rating (ACGIH 1997) A2 compounds are suspected human carcinogens OSHA 1995 PEL (8 Hr. TWA) = 1,000 Molar PPM.</p>
<p>SYMPTOMS OF EXPOSURE <u>Inhalation:</u> Moderate concentrations cause dizziness, drowsiness, blurring of vision and nausea. In higher concentrations, it is an anesthetic and can cause respiratory paralysis and death. <u>Skin and Eye Contact:</u> It is irritating to mucous membranes and the skin. Due to its rapid rate of evaporation, it can cause tissue freezing or frostbite on dermal contact.</p>
<p>TOXICOLOGICAL PROPERTIES It is an asphyxiant and anesthetic causing respiratory paralysis in high concentrations Repeated exposures have given no indication of cumulative action. Vapors cause skin rash and are irritating to the eyes and mucous membranes. Frostbite effects are a change in color of the skin to gray or white possibly followed by blistering. IARC and NTP studies and reports show sufficient evidence for animals and insufficient evidence for humans for 1,3-butadiene as a carcinogen.</p> <p style="text-align: right;">(continued on Page 4)</p>
<p>RECOMMENDED FIRST AID TREATMENT PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO 1,3-BUTADIENE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD. Inhalation: 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.</p>

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use. Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

1,3- Butadiene is flammable over a wide range in air. It also may form explosive peroxides on exposure to air.

PHYSICAL DATA

BOILING POINT 24.1°F (-4.4°C)	LIQUID DENSITY AT BOILING POINT 40.6 lb/ft ³ (650.4 kg/m ³)
VAPOR PRESSURE (248 kPa)	GAS DENSITY AT 70°F, 1 atm 0.145 lb/ft ³ (2.32 kg/m ³)
SOLUBILITY IN WATER Insoluble	FREEZING POINT -164.1°F (-108.9°C)
EVAPORATION RATE N/A (Gas)	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) = 1.94
APPEARANCE AND ODOR Colorless gas with an aromatic odor.	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) -105°F (-76°C) Closed Cup	AUTO IGNITION TEMPERATURE 788°F (420°C)	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LE 2 UEL 12
EXTINGUISHING MEDIA Water, carbon dioxide, dry chemical	ELECTRICAL CLASSIFICATION Class 1, Group B	
SPECIAL FIRE FIGHTING PROCEDURES If possible, stop the flow of 1,3-Butadiene. Use water spray to cool surrounding containers.		
UNUSUAL FIRE AND EXPLOSION HAZARDS 1,3-Butadiene 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

STABILITY Unstable		CONDITIONS TO AVOID None
Stable	X	
INCOMPATIBILITY (Materials to avoid) Oxidizers		
HAZARDOUS DECOMPOSITION PRODUCTS None		
HAZARDOUS POLYMERIZATION May Occur		CONDITIONS TO AVOID
Will Not Occur	X	1,3-Butadiene is shipped with an inhibitor to prevent polymerization.

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 user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact your closest supplier location or call the emergency telephone number listed herein.

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 your closest supplier location or call the emergency telephone listed herein.

SPECIAL PROTECTION INFORMATION

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

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION			
DOT Shipping name:	Butadienes, inhibited	DOT Hazard Class:	Division 2.1
DOT Shipping Label:	Flammable gas	I.D. No.:	UN 1010; RQ 1.0 (0.454)
SPECIAL HANDLING RECOMMENDATIONS			
<p>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 (<150 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.</p> <p>For additional handling recommendations, consult Compressed Gas Association's Pamphlet P-1.</p>			
SPECIAL STORAGE RECOMMENDATIONS			
<p>Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of noncombustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125F (52C). 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. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.</p> <p>For additional storage recommendations, consult Compressed Gas Association's Pamphlet P-1</p>			
SPECIAL PACKAGING RECOMMENDATIONS			
1,3-Butadiene is noncorrosive and may be used with any common structural material.			
OTHER RECOMMENDATIONS OR PRECAUTIONS			
<p>Earth-ground and bond all lines and equipment associated with the 1,3-Butadiene 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 Federal Law (49CFR).</p>			
(Continued on Page 4)			

*Various Government Agencies (i.e. Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

1,3-Butadiene

HEALTH HAZARD DATA

TOXICOLOGICAL PROPERTIES: (Continued)

Persons in ill health where such illness would be aggravated by exposure to 1,3-butadiene should not be allowed to work with or handle this product.

RECOMMENDED FIRST AID TREATMENT: (Continued)

Dermal Contact or Frostbite: 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.

SPECIAL PRECAUTIONS

OTHER RECOMMENDATIONS OR PRECAUTIONS: (Continued)

Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

1,3-Butadiene is considered a toxic chemical and is subject to the reporting requirements of SARA, Title III, Section 313.

NFPA 704 No. for 1,3-butadiene = 2 4 2 None