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MATERIAL SAFETY DATA SHEET

No. 24

PRODUCT NAME Ethane	CAS # 74-84-0
TRADE NAME AND SYNONYMS Ethane, Methylnmethane, Dimethyl, Ethyl Hydride	DOT I.D. No.: UN 1035
	DOT Hazard Class: Division 2.1
CHEMICAL NAME AND SYNONYMS Ethane, compressed (D.O.T)	Formula C ₂ H ₆
	Chemical Family: Aliphatic Hydrocarbon
ISSUE DATES AND REVISIONS Revised January 1995	

HEALTH HAZARD DATA

<p>TIME WEIGHTED AVERAGE EXPOSURE LIMIT Ethan is defined as a simple asphyxiant (ACGIH 1994-1995). No PEL (8 Hr. TWA) is listed by OSHA (1993). (Continued on Page 4)</p>
<p>SYMPTOMS OF EXPOSURE <u>Inhalation:</u> High concentrations of ethane so as to exclude an adequate supply of oxygen to the lungs causes dizziness, deeper breathing due to air hunger, possible nausea and eventual unconsciousness. Contact with rapidly evaporating liquid can cause cryogenic "burns" or frostbite</p>
<p>TOXICOLOGICAL PROPERTIES Ethane is inactive biological and essentially nontoxic; therefore, 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. Ethane is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen. Persons in ill health were such illness would be aggravated by exposure to ethane should not be allowed to work with or handle this product.</p>
<p>RECOMMENDED FIRST AID TREATMENT PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO THIS MIXTURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD. <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. Assure that vomited material does not obstruct the airway by use of positional drainage. 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.

Ethane

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

Ethane is flammable in air

PHYSICAL DATA

BOILING POINT -127.5°F (-88.6°C)	LIQUID DENSITY AT BOILING POINT 34.1 lb/ft ³ (546 kg/m ³)
VAPOR PRESSURE 558 psia (3847 KPa)	GAS DENSITY AT 70°F, 1 atm .078 lb/ft ³ (1.25 Kg/M ³)
SOLUBILITY IN WATER Negligible	FREEZING POINT -297.9°F (-183.3°C)
EVAPORATION RATE N/A (Gas)	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) 1.04
APPEARANCE AND ODOR Colorless, orderless gas	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) -211°F (-135°C)	AUTO IGNITION TEMPERATURE 959°F (515°C)	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LE 3 UEL 12.4
EXTINGUISHING MEDIA Water, carbon dioxide, dry chemical		ELECTRICAL CLASSIFICATION Class 1, Group D
SPECIAL FIRE FIGHTING PROCEDURES If possible, stop the flow of ethane. Use water spray to cool surrounding containers		
UNUSUAL FIRE AND EXPLOSION HAZARDS Ethane is slightly 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) None		
HAZARDOUS DECOMPOSITION PRODUCTS Carbon Monoxide		
HAZARDOUS POLYMERIZATION May Occur		CONDITIONS TO AVOID None
Will Not Occur	X	

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 <u>properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place</u> to your supplier. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number 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 LEL	SPECIAL	N/A
	MECHANICAL (Gen.) In accordance with electrical codes	OTHER	N/A
PROTECTIVE GLOVES Plastic rubber			
EYE PROTECTION safety goggles or glasses			
OTHER PROTECTIVE EQUIPMENT Safety shoes, safety shower, eyewash "fountain."			

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION	
DOT Shipping Name: Ethane Compressed	DOT Hazard Class: Division 2.1
DOT Shipping Label: Flammable Gas	I.D. No. UN 1035
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 (<2000 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.	
For additional handling recommendations, consult Compressed Gas Associations' Pamphlets P-1, p-14 and safety bulletin SB-2	
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 (52°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 being stored for excessive periods of time.	
For additional storage recommendations, consult Compressed Gas Associations Pamphlets P-1, p-14 and safety bulletin SB-2	
SPECIAL PACKAGING RECOMMENDATIONS	
Ethane 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 diboran system. Electrical equipment should be non-sparking or explosion proof. Compressed gas cylinders should not be refilled except by qualified producers or. 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).	
(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.

HEALTH HAZARD DATATIME WEIGHTED AVERAGE EXPOSURE LIMIT: (continued)

Oxygen levels should be maintained at greater than 18 Molar percent at normal atmospheric pressure ($pO_2 > 135$ torr.)

RECOMMENDED FIRST AID TREATMENT:

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

SPECIAL PRECAUTIONSOTHER 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.

Reporting under SARA, Title III, Section 313 not required.

NFAP 704 No. for ethane = 1 4 0 None