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MATERIAL SAFETY DATA SHEET

PRODUCT NAME Halocarbon 116	CAS # 76-16- 4
TRADE NAME AND SYNONYMS Halocarbon 116; Hexafluoroethane (D.O.T.); Perfluoroethane	DOT I.D. No.: UN 2193
	DOT Hazard Class: Division 2.2
CHEMICAL NAME AND SYNONYMS Hexafluoroethane, Perfluoroethane	Formula C ₂ F ₆
	Chemical Family: Fluorinated Hydrocarbon
ISSUE DATES AND REVISIONS Revised: September 27, 2010	

HEALTH HAZARD DATA

<p>TIME WEIGHTED AVERAGE EXPOSURE LIMIT TWA = None listed (ACGIH 1994-1995). OSHA 1993 PEL (8 Hr. TWA) = None listed Oxygen levels should be maintained (Continued on Page 4)</p>
<p>SYMPTOMS OF EXPOSURE Inhalation: High concentrations of halocarbon 116 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 the rapidly evaporating liquid can cause cryogenic "burns" or frostbite.</p>
<p>TOXICOLOGICAL PROPERTIES Halocarbon 116 is inactive biologically 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. Halocarbon 116 is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen. (Continued on Page 4)</p>
<p>RECOMMENDED FIRST AID TREATMENT PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO HALOCARBON 116. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. 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. Skin 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 skin surface or deep tissue freezing.</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 or 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

Halocarbon 116 is a relatively inert nonreactive gas.

PHYSICAL DATA

BOILING POINT -108.8°F (-78.2°C)	LIQUID DENSITY AT BOILING POINT 100.4 lb/ft ³ (1608 kg/m ³)
VAPOR PRESSURE @ 70°F (21.1°C) = 445 psia (3068 kPa)	GAS DENSITY AT 70°F, 1 atm 358 lb/ft ³ (5.73 kg/m ³)
SOLUBILITY IN WATER Very slightly soluble	FREEZING POINT -149.3°F (-100.7°C)
EVAPORATION RATE N/A (Gas)	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) =4.78
APPEARANCE AND ODOR Colorless and odorless gas	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) N/A	AUTO IGNITION TEMPERATURE N/A	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LE N/A UEL N/A
EXTINGUISHING MEDIA Nonflammable Gas		ELECTRICAL CLASSIFICATION Nonhazardous
SPECIAL FIRE FIGHTING PROCEDURES If cylinders are involved in a fire, safely relocate or keep cool with water spray.		
UNUSUAL FIRE AND EXPLOSION HAZARDS If halocarbon 116 is involved in a fire, it may decompose yielding toxic products.		

REACTIVITY DATA

STABILITY Unstable		CONDITIONS TO AVOID None
Stable	X	
INCOMPATIBILITY (Materials to avoid) None		
HAZARDOUS DECOMPOSITION PRODUCTS Hydrogen fluoride and other toxic fluorides		
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 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 See Local Exhaust	LOCAL EXHAUST See page 4	SPECIAL N/A
	MECHANICAL (Gen.) N/A	OTHER N/A
PROTECTIVE GLOVES Any, but natural rubber		
EYE PROTECTION Safety goggles or glasses		
OTHER PROTECTIVE EQUIPMENT Safety shoes		

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION		
DOT Shipping Name:	Hexafluoroethane	DOT Hazard Class: Division 2.2
DOT Shipping Label:	Nonflammable Gas	I.D. No.: UN 2193
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 (<750 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 Pamphlets P-1, P-14, and Safety Bulletin SB-2.</p>		
SPECIAL STORAGE RECOMMENDATIONS		
<p>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.</p> <p>For additional storage recommendations, consult Compressed Gas Association's Pamphlets P-1, P-14, and Safety Bulletin SB-2.</p>		
SPECIAL PACKAGING RECOMMENDATIONS		
<p>Halocarbon 116 is noncorrosive and may be used with any common structural material. Silver and copper bearing alloys can act as catalysts for the decomposition of halocarbon 116 at high temperatures. Alloys containing more than 2% magnesium should not be used if water is present.</p>		
OTHER RECOMMENDATIONS OR PRECAUTIONS		
<p>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). See Compressed Gas Association's Safety Bulletin SB-1.</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.

Halocarbon 116

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT: (Continued)

at greater than 18 molar % at normal atmospheric pressure ($pO_2 > 135$ torr).

TOXICOLOGICAL PROPERTIES: (Continued)

Persons in ill health where such illness would be aggravated by exposure to halocarbon 116 should not be allowed to work with or handle this product.

SPECIAL PROTECTION INFORMATION: (Continued)

LOCAL EXHAUST

To prevent accumulation of high concentrations so as to reduce the oxygen level in the air to less than 18 molar percent.

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.

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

NFPA 704 No. for halocarbon 116 = 1 None