

MATERIAL
SAFETY
DATA SHEET

PRODUCT NAME Octafluorocyclobutane	CAS # 115-25-3
TRADE NAME AND SYNONYMS Octafluorocyclobutane; Perfluorocyclobutane; Halocarbon 318	DOT I.D. No.: UN 1976
	DOT Hazard Class: Division 2.2
CHEMICAL NAME AND SYNONYMS Octafluorocyclobutane or Perfluorocyclobutane	Formula C ₄ F ₈
	Chemical Family: Perfluorocycloalkane
ISSUE DATES AND REVISIONS Revised January 1995	

HEALTH HAZARD DATA

<p>TIME WEIGHTED AVERAGE EXPOSURE LIMIT None established. It should be considered a simple asphyxiant (ACGIH 1994-1995). OSHA1993 PEL (8 Hr. TWA) = None listed. (Continued on Page 4)</p>
<p>SYMPTOMS OF EXPOSURE <u>Inhalation:</u> High concentrations of octafluorocyclobutane 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 Octafluorocyclobutane 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. Persons in ill health where such illness would be aggravated by exposure to octafluorocyclobutane should not be allowed to work with or handle this product. (Continued on Page 4)</p>
<p>RECOMMENDED FIRST AID TREATMENT PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO OCTAFLUOROCYCLOBUTANE. 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. (Continued on Page 4)</p>

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OCTAFLUOROCYCLOBUTANE

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

Octafluorocyclobutane is a relatively inert, non-reactive gas.

PHYSICAL DATA

BOILING POINT 21.2°F (-6°C)	LIQUID DENSITY AT BOILING POINT 102.2 lb/ft ³ (1637 kg/m ³)
VAPOR PRESSURE 40.6 psia (280 kPa)	GAS DENSITY AT 700F. 1 atm .541 lb/ft ³ (8.66 kg/m ³)
SOLUBILITY IN WATER Very slightly; possible slight hydrolysis	FREEZING POINT -40.9°F (-40.5°C)
EVAPORATION RATE Unknown; greater than 99.9 + % volatile	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) = 7.22
APPEARANCE AND ODOR Colorless gas with slight ethereal odor	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) N/A	AUTO IGNITION TEMPERATURE N/A	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LEL 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 octafluorocyclobutane 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 None		
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 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 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
PROTECTIVE GLOVES As appropriate			
EYE PROTECTION Safety goggles or glasses			
OTHER PROTECTIVE EQUIPMENT Safety shoes			

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION	
DOT Shipping Name: Octafluorocyclobutane	DOT Hazard Class: Division 2.2
DOT Shipping Label: Nonflammable Gas	I.D. No.: UN 1976
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 (<125 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 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.</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	
Octafluorocyclobutane is noncorrosive and may be used with any common structural material.	
OTHER RECOMMENDATIONS OR PRECAUTIONS	
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). (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.

OCTOFLUOROCYCLOBUTANE

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT: (Continued)

Oxygen levels should be maintained at greater than 18 Molar percent at normal atmospheric pressure (pO₂>135 torr).

TOXICOLOGICAL PROPERTIES: (Continued)

Octafluorocyclobutane is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen.

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 PROTECTION INFORMATION

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 octafluorocyclobutane = 2 0 0 None