



## HONG KONG SPECIALTY GASES CO., LTD.

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## MATERIAL SAFETY DATA SHEET

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| PRODUCT NAME<br>Octafluorocyclobutane  | CAS#<br>115-25-3                         |
| TRADE NAME AND SYNONYMS<br>Octafluorocyclobutane; Perfluorocyclobutane;<br>Halocarbon RC-318 | DOT I.D. NO.<br>UN 1976                  |
| CHEMICAL NAME AND SYNONYMS<br>Octafluorocyclobutane or Perfluorocyclobutane                  | DOT HAZARD CLASS<br>Division 2.2         |
| ISSUE DATE AND REVISIONS<br>Revised April 2001   | FORMULA<br>C <sub>4</sub> F <sub>8</sub> |

### HEALTH HAZARD DATA

#### EMERGENCY OVERVIEW

Octafluorocyclobutane is a high pressure liquid and gas. Octafluorocyclobutane is harmful if inhaled. It can cause rapid suffocation and may cause dizziness and drowsiness. So, self-contained breathing apparatus may be required by rescue workers.

#### SYMPTOMS OF EXPOSURE

Inhalation: 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.

#### 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.

#### RECOMMENDED FIRSTAID TREATMENT

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO OCTAFLUOROCYCLOBUTANE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

Inhalation: Conscious person 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.

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.

Skin Contact: For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105 °F (41 °C). In case of massive exposure, remove clothing while showering with warm water. Wash clothing before reuse. Discard shoes and leather goods. Call a physician.

Eye Contact: For contact with the liquid, immediately flush eyes with warm water. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. See a physician, preferably an ophthalmologist, immediately.

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

Octafluorocyclobutane is a relatively inert, non-reactive gas.

### PHYSICAL DATA

|   |   |
|---|---|
| BOILING POINT<br>21.2°F (-6°C)                                      | LIQUID DENSITY AT BOILING POINT<br>102.2 lb/ft <sup>3</sup> (1637 kg/m <sup>3</sup> ) |
| VAPOR PRESSURE<br>40.6 psia (280 kPa)                               | GAS DENSITY AT 700F. 1 atm<br>.541 lb/ft <sup>3</sup> (8.66 kg/m <sup>3</sup> )       |
| SOLUBILITY IN WATER<br>Very slightly; possible slight hydrolysis    | FREEZING POINT<br>-40.90 °F (-40.5 °C)  |
| EVAPORATION RATE<br>Unknown; greater than 99.9 + % volatile         | SPECIFIC GRAVITY (AIR=1)<br>7.22 at 70 °F (21.1 °C)                                   |
| APPEARANCE AND ODOR<br><br>Colorless gas with slight ethereal odor. |   |

### FIRE AND EXPLOSION HAZARD DATA

| FLASH POINT (Method used)<br>N/A  | AUTO IGNITION TEMPERATURE<br>N/A          | FLAMMABLE LIMITS % BY VOLUME<br>LEL N/A UEL N/A |
|---|---|---|
| EXTINGUISHING MEDIA<br>Nonflammable gas   | ELECTRICAL CLASSIFICATION<br>Nonhazardous |   |
| SPECIAL FIRE FIGHTING PROCEDURES<br>If cylinders are involved in a fire, safely relocate or keep cool with water spray.         |   |   |
| UNUSUAL FIRE AND EXPLOSION HAZARDS<br>If octafluorocyclobutane is involved in a fire, it may decompose yielding toxic products. |   |   |

### REACTIVITY DATA

| STABILITY                                    |  | CONDITIONS TO AVOID<br>None              |
|--|--|--|
| Unstable                                     |  |  |
| INCOMPATIBILITY (Materials to avoid)<br>None |  |  |
| HAZARDOUS POLYMERIZATION<br>May Occur        |  | HAZARDOUS DECOMPOSITION PRODUCTS<br>None |
| Will Not Occur                               |  |  |

### 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 cylinder or cylinder 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 HSG. For emergency disposal assistance, contact HSG for specific advice. |  |

## 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><br>See Local Exhaust   | <b>SPECIAL</b><br>N/A     |                                 |
| <b>MECHANICAL (Gen.)</b><br>N/A   | <b>OTHER</b><br>N/A       |                                 |
| <b>LOCAL EXHAUST</b><br>To prevent accumulation of high concentrations so as to reduce the oxygen level in the air to less than 18 molar percent. |                           | <b>MECHANICAL (Gen.)</b><br>N/A |
| <b>PROTECTIVE GLOVES</b>  | As appropriate            |                                 |
| <b>EYE PROTECTION</b>   | Safety goggles or glasses |                                 |
| <b>OTHER PROTECTIVE EQUIPMENT</b><br>Safety shoes   |                           |                                 |

## SPECIAL PRECAUTIONS\*

|   |   |
|---|---|
| <b>SPECIAL LABELING INFORMATION</b><br>DOT Shipping Name: Octafluorocyclobutane<br>DOT Shipping Label: Nonflammable Gas   | DOT Hazard Class: Division 2.2<br>I.D. No.: UN 1976 |
| <b>SPECIAL HANDLING RECOMMENDATIONS</b><br>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 system. 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. |   |
| <b>SPECIAL STORAGE RECOMMENDATIONS</b><br>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.   |   |
| <b>SPECIAL PACKAGING RECOMMENDATIONS</b><br>Octafluorocyclobutane is noncorrosive and may be used with any common structural material.  |   |
| <b>OTHER RECOMMENDATIONS OR PRECAUTIONS</b><br>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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